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The success of task type in facilitating oral language production in online computer mediated collaborative projects

by

Shannon Jennifer Sauro

A thesis submitted to the graduate faculty in partial fulfillment of the requirements for the degree of
MASTER OF ARTS

Major: English (Teaching English as a Second Language/Applied Linguistics)
Major Professor: Carol Chapelle

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This is to certify that the Master's thesis of

Shannon Jennifer Sauro

has met the thesis requirements of Iowa State University

Major Professor

For the Major Program

For the Graduate College
For Grandma and Grandpa
&
Mom and Dad
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This study investigates two different communicative language tasks, a jigsaw task and a decision-making task, performed by four dyads using a voice/text-chat application over the Internet. Both tasks were specifically designed for this study to make use of resources available online for use in the CALL classroom. Two dyads of non-native English speakers and two mixed dyads of one non-native English speaker and one native English speaker were used to see if dyad type influenced language use during the tasks. Video-recordings made of each session were transcribed and analyzed to determine the feasibility of each task and whether the tasks facilitated oral language and the negotiation of meaning. Ethnographic data collected from observation and participant interviews was also used to determine the strengths and weaknesses of each task and the drawbacks or advantages of using such activities for language learning.

The findings showed that both tasks could be completed to varying degrees in approximately 20 minutes, but that the feasibility of each task was dependent upon individual student preferences and familiarity with the content of each task in addition to task type. The decision-making task proved easier for dyads to comprehend and complete than the jigsaw task. In addition, negotiation of meaning was found in both types of dyads, but more so among one of the non-native speaking dyads which made use of a voice-activated microphone. Furthermore, statistical analysis of the mixed native and non-native English speaking dyads also showed that negotiation of meaning decreased from the first task to the second task regardless of task type. This was
facilitated by the attempts of the native speaking participants to avoid miscommunication by speaking more carefully or making use of text-chat to supplement what was said.

These findings will be useful for L2 instructors based in a CALL classroom looking for communicative tasks that make use of Internet resources. These findings can also serve to help open up a link between CALL and SLA research by demonstrating to what degree theory of instructed SLA accounts for the success of CALL activities in promoting the negotiation of meaning and to what degree this theory may be altered to reflect the realities of a CALL environment.
CHAPTER 1. INTRODUCTION

Relevance of this Study

Teaching English conversation in Japan for several years brought me face-to-face with the difficulties English as a foreign language (EFL) students have in finding opportunities to use spoken English in meaningful contexts. Aside from their classroom instructor, few students ever receive exposure to other native English speakers or even non-native English speakers from other language backgrounds. As a result of this lack of exposure and opportunity to speak English with less sympathetic interlocutors, many of these EFL students are unprepared for what awaits them when they venture abroad to study, work or even travel.

However, just as the Internet has served to bridge the gap between businesses and consumers, it also possesses the same potential for bridging the gap between classroom and real-world discourse. Programs and software which facilitate asynchronous written communication (E-mail) or synchronous communication (InterChange, MOOs) have already been widely used and researched in foreign language classrooms. Although research in this area has been far from exhaustive, the continuous emergence and growing availability of newer and faster technology has begun to enable synchronous oral communication as well. E-mail and text-chat provide opportunities for learners to make use of and receive real-world feedback on their second language (L2) abilities, but this written communication does not provide them with opportunities to develop their listening and speaking skills – skills many Asian students continue to struggle with when they decide to study at American universities.
With the emergence and growing improvement of free downloadable software like Yahoo! Messenger, CheetaChat, ICQ, and Microsoft Netmeeting, which permit both synchronous voice-chat and text-chat, the Internet may be used to bring more challenging and more realistic opportunities for speaking English into the computerized EFL classroom.

Seeing this emerging technology, I became excited at the prospects of what it could contribute to the students’ learning. However, as with any tool, computers and programs that enable voice-chat by themselves are not the miracle cure for teaching English conversation in EFL classes. Appropriate tasks must be designed which make use of this technology to aid in second language acquisition. In response to this need, this study examines two different types of computer mediated communication (CMC) tasks, jigsaw and decision-making, for use in an EFL classroom. These types of tasks, common to the traditional classroom in face-to-face exchanges, have been the focus of prior second language acquisition research. Nevertheless, prior face-to-face research cannot necessarily predict the success or effectiveness of these tasks when conducted through a computerized medium.

**Research Questions**

Although current research in computer assisted language learning (CALL) has moved beyond merely comparing the environments of the traditional classroom and the computer classroom, there is still a dearth of research which actually investigates the effectiveness or success of CALL tasks in providing opportunities for second language acquisition (SLA) (Chapelle, 2001). According to the interactionist model of SLA, one ideal opportunity for second language acquisition occurs during the negotiation of meaning. The model argues
that the negotiation of meaning leads to greater comprehension which in turn leads to
acquisition (Long, 1983). Although tasks which foster the negotiation of meaning have been
the focus of research and theory in traditional face-to-face classroom activities, there has
been very little research into communicative tasks in a CALL environment which also foster
or hinder the negotiation of meaning. As a result, this study is intended to address this gap in
instructed SLA research in CALL environments. To do so, I will look at two original tasks
performed by four dyads via oral and text-based CMC to determine whether such tasks can
be completed in a CALL environment and whether the results of research into negotiation of
meaning during face-to-face tasks holds true for CMC tasks. It is hoped that this study will
also provide insight into the creation and evaluation of CMC tasks for use in the EFL
classroom. In keeping with these goals, this study will investigate the following five
questions:

1. Does the type of task, (jigsaw or decision-making) used in online collaborative
   learning projects effect the amount of oral and written language produced by learners
   of English?

2. Will CMC, using voice-chat, support prior SLA research, which found that jigsaw
tasks facilitated greater negotiation of meaning than decision-making tasks?

3. What effects will NS/NNS oral online collaboration have on NS and NNS
   participation and negotiation of meaning, especially as compared to NNS dyads?

4. Can certain online collaborative tasks be completed successfully by either non-native
   English speaking dyads or mixed native and non-native English speaking dyads, and
   specifically which tasks facilitated completion?
5. Do L2 students believe that online collaborative tasks which make use of voice-chat actually benefit their oral language reception and production?

**Organization of this Study**

The following chapters will include a literature review, Chapter 2, that begins with a brief look at theories in second language acquisition which focus on the negotiation of meaning and the creation of communicative tasks. This will be followed by a look at literature which indicates a need for research that attempts to bridge SLA theory and CALL. I will also discuss recent CALL research that stresses computer-mediated communication (CMC), including studies which actually have begun to bridge this gap between SLA and CALL. In Chapter 3, I will delineate the task creation process, the participant selection, the actual experimental procedure, and the methods of analysis used throughout the study. In Chapter 4, I will present and discuss both the quantitative and qualitative results of the study that observation, statistical analysis; and the retrospective insights of my participants revealed. Chapter 5 will conclude this thesis with suggestions for further research and implications for EFL teachers interested in using similar communicative tasks to link their classes with other classes of students over the Internet.
CHAPTER 2. LITERATURE REVIEW

In this chapter, I will give an overview of research in two major areas of relevance to the use of communicative tasks in the CALL classroom. In the first half of this literature review, I will look at SLA research which has led to the classification of communicative tasks found beneficial for inducing the negotiation of meaning. I will also take a closer look at studies concerned with investigating the effectiveness of negotiation of meaning in contributing to second language comprehension and acquisition. The second half of this chapter moves from research in SLA to recent CALL studies concerned with computer mediated communication (CMC). This overview of recent CMC studies reveals a dearth of research that draws on work on instructed SLA to investigate CALL, a gap which this study is meant to help bridge.

Communicative Tasks for the Classroom

The traditional language classroom has undergone a revolution in teaching method over the past several decades. Teaching approaches which focus on form, negotiation of meaning, and communicative competence have induced teachers to create communicative language tasks instead of the grammar worksheets and translation exercises of the past. The communicative classroom’s need for language tasks has led to a creative spurt among foreign and second language teachers who are eager to provide meaningful and useful opportunities for their students to use language. However, using a task-based approach to language teaching does not guarantee that the tasks used are any more helpful for language learning
than grammar drills and translation exercises. As a result, these tasks have invited a great deal of investigation in the field of second language acquisition research.

**Interactionist Theory of SLA**

In the late 1970s and early 1980s, interactionist theory held that second language learners’ acquisition benefited from negotiating with their interlocutors to arrive at mutual comprehension of meaning (Pica, Kanagy & Falodun, 1993). Long’s (1983) theory argued that negotiated interaction led to comprehension, and this comprehension would facilitate acquisition. As a result, he reasoned that negotiated interaction led to acquisition. In other words, conversations in which learners were free to ask for clarification, explanations or other kinds of linguistic and lexical “help” from their interlocutors not only led to the ability to understand the conversation at hand but helped learners to acquire these particular problem areas. As a result, tasks which gave learners opportunities for modification and negotiation became a focal point for research.

Long’s theory was based on reasoning, but one must ask whether negotiated interaction has actually had an impact on L2 comprehension and learning. In order to address this question, Pica (1994) set about examining the form negotiation took during task interaction between a native and a non-native speaker of English and whether these instances of negotiation actually did aid comprehension. She compared the task results of a group of students who were given pre-modified task directions, directions in which complexity and length of utterances had been simplified and repeated or rephrased, with the task results of a group of students who were given unmodified directions, but who were allowed to ask for clarification. In doing so, she found that the group which was permitted to negotiate input
outperformed the group that received the pre-modified instructions, an indication that negotiation of meaning did lead to greater comprehension.

A second study conducted by Gass and Varonis (1994) further investigated interactionist theory of SLA to see if negotiated interaction truly led to acquisition. In their study, pairs of native and non-native speakers performed two similar tasks. During the first task, the native speakers were responsible for giving task directions to the non-native speakers, and in the second task, it was the role of the non-native speakers to instruct the native speakers. This study found that when giving directions for the second task the non-native speakers who were allowed to negotiate and seek clarification from their partners during the first task actually made use of the expressions the native speakers had used during the earlier negotiation routines. In other words, the negotiated language used to help the non-native speakers comprehend task directions appeared in their own subsequent language output. In this manner, Gass and Varonis's study verified Long's use of logic to explain interactionist theory of SLA.

Tasks Which Foster Negotiation of Meaning

As interactionist theory garnered interest, more research into ideal tasks which promoted interaction began to demand investigation for use in the classroom. Early research focused on task type and attempted to define parameters which induced greater amounts of modification and negotiation on the part of learners. An early attempt to categorize tasks compared two task types: two-way tasks and one-way tasks (Long, 1981). Long defines a one-way task as one in which the flow of discourse is unidirectional such as might be found in story-telling, giving instructions, or giving an opinion. Conversely, two-way tasks are
tasks which provide both interlocutors opportunities for both input and output. Long's study found greater amounts of modification during the two-way tasks than during the one-way tasks.

A later study which also made use of a one-way and two-way task reached a different conclusion, however. Gass and Varonis (1985) also investigated nonnative speaker discourse among three dyads and one triad of nonnative English speakers from various language backgrounds while completing a one-way and a two-way task. Their results indicated that although there was no significant difference in the amount of negotiation of meaning that took place, there was slightly more negotiation during the one-way tasks. In signaling this discrepancy, however, Gass and Varonis do point out two major differences between their study and Long's. First, they specifically focused on negotiation of meaning while Long's study took into consideration a much wider variety of interaction modifications. Secondly, their one-way task was not as strictly one-way as Long's; in their task, the listener, who drew a picture according to the description provided by the speaker, was permitted to ask questions for clarification. In particular, Gass and Varonis believed that the output required of the listener in the one-way task, a drawing, factored into the amount of negotiation that took place. Arguably, had the output the listener was required to produce taken a different form, there might have been a different amount of negotiation.

Studies like this indicate that there are more variables in a task which may influence amounts of negotiation than Long's two categories can account for. As a result, other researchers have attempted to flesh out these factors to create more descriptive task categories which take more into account than the direction of the discourse. In 1986,
Doughty and Pica attempted to more clearly define a type of two-way task, a *two way information gap task*. As the name Information Gap signifies, information which is necessary for the solution of the task, is missing. In a two way information gap task, the missing pieces of information are scattered among the task participants thereby requiring that all students working on the task must participate in order to arrive at the correct solution. The obligatory involvement of all participants is what differentiates a two-way or multidirectional information gap task from a regular information gap, in which participation is optional.

**Categorization and Evaluation of Communicative Task Features**

Further research in task development led to the categorization of five typical classroom communicative tasks and to the identification of task features which either promoted or hindered the negotiation of meaning. Pica, Kanagy, and Falodun (1993) established two main categories each with subcategories of task features: interactant relationship, interactional goal, communication goal, and outcome option. Interactant relationship describes the role of each participant, whether one or all participants are responsible for requesting and supplying information. Interactional goal describes whether participation is obligatory, as in the two way information gap described above, or is optional, as is typical of an opinion exchange activity. Communication goal describes whether participants have convergent or joint goals, which requires that they work together, or divergent or individual goals, which may lead to competition instead of collaboration. Finally, outcome options determines whether there is one or more than one acceptable task outcome.
Pica et al. (1993) determined that a task which possessed the four features defined in Table 2.1 was most likely to lead to negotiation of meaning. Because of these four conditions, both interlocutors must actively participate and exchange information while ensuring that they understand one another in order to complete the task successfully. In instances where misunderstandings do occur, the nature of the task would induce negotiation of meaning.

| Table 2.1. Task Features Most Likely to Lead to Negotiation of Meaning |
|-----------------------------|-------------------------------------------------------------------|
| **Categories**              | **Task Features**                                                 |
| Interactant Relationship    | Each interactant holds a different portion of information which must be exchanged and manipulated in order to reach the task outcome. |
| Interactional Goal          | Both interactants are required to request and supply this information to each other. |
| Communication Goal          | Interactants have the same or convergent goals.                   |
| Outcome Option              | Only one acceptable outcome is possible from their attempts to meet this goal. |

(Pica et al., 1993)

Using these four task features, the researchers evaluated five communicative language tasks often used in the L2 classroom: jigsaw, information gap, problem-solving, decision-making, and opinion exchange (Table 2.2). According to the four characteristics detailed in Table 2.1, jigsaw tasks would be most conducive to the negotiation of meaning; both participants would be required to request and supply information through convergent goal of arriving at the one correct solution. Conversely, opinion-exchange tasks, which may take the form of a discussion question (Should high school students be required to wear a
uniform?), are the least conducive to negotiation of meaning. This is because the task does not make it necessary for participants to volunteer their full and honest opinions. As a result, the interactant relationship is left to the discretion of the students themselves, who may or may not choose to request or supply information. The fact that opinion exchanges do not have a definite goal coupled with the non-convergent nature of the task - students do not need to persuade one another or come up with a best answer – further reduces the need to negotiate for meaning.

<table>
<thead>
<tr>
<th>Task Type</th>
<th>Interactant Relationship</th>
<th>Interational Goal</th>
<th>Communication Goal</th>
<th>Outcome Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jigsaw</td>
<td>Both participants possess, request, and supply information</td>
<td>Required</td>
<td>Convergent</td>
<td>One</td>
</tr>
<tr>
<td>Information Gap</td>
<td>Either participant possesses, requests, and supplies information.</td>
<td>Required</td>
<td>Convergent</td>
<td>One</td>
</tr>
<tr>
<td>Problem-Solving</td>
<td>Participants possess information, but may or may not request or supply it.</td>
<td>Optional</td>
<td>Convergent</td>
<td>One</td>
</tr>
<tr>
<td>Decision-Making</td>
<td>Participants possess information, but may or may not request or supply it.</td>
<td>Optional</td>
<td>Convergent</td>
<td>More than one</td>
</tr>
<tr>
<td>Opinion Exchange</td>
<td>Participants possess information, but may or may not request or supply it.</td>
<td>Optional</td>
<td>Not convergent</td>
<td>More or less than one</td>
</tr>
</tbody>
</table>

(Pica et al., 1993)
Other Variables Which Influence Task Usefulness for SLA

Although these definitions of task features outlined in the previous section are helpful for creating activities which are beneficial to instructed SLA, they fail to prepare teachers and researchers for the influence non-task variables may have on the usefulness or effectiveness of such tasks in promoting SLA.

One such variable is discussed in Gass and Varonis's (1985) earlier study which looked at the influence the gender of the interlocutors had on negotiation of meaning. They found a discrepancy between the frequency with which the men and women in the study negotiated. For the most part, the men were more likely to indicate a problem with the input than were the women.

A second variable that has a distinct influence on the usefulness of such tasks in promoting SLA is related to the type of feedback the learner receives. As prior research had indicated (Gass & Varonis, 1994; Pica, 1994), tasks which lead to the negotiation of meaning can also lead to greater L2 comprehension and acquisition, but are all types of meaning negotiation equally effective in helping learners? One study which investigated feedback to requests for clarification looked at the differences between feedback learners received from NS and NNS interlocutors (Pica, Lincoln-Porter, Paninos & Linnell, 1996). This study found that NNS interlocutors were actually able to provide modified input, modified output and feedback. Nevertheless, NNS/NNS pairings did not produce as many negotiation routines as did NS/NNS pairings did. It was also found that although NNS pairings did not produce as many negotiations useful in L2 learning, they did produce a high quantity of utterances which contained feedback in a more simplified form. This study would indicate that the
interlocutors involved in completing a task would also be a major factor in the amount and type of negotiation that would take place.

Language background is not the only interlocutor quality that impacts the amount of negotiation of meaning which occurs during task completion. Another factor that has been investigated for its effect on negotiation of meaning is interlocutor familiarity. By comparing the interactions of 5 dyads of familiar interlocutors with 5 dyads of unfamiliar interlocutors who completed 2 sets of tasks, Plough and Gass (1993) observed that the familiar pairs were more willing to indicate a misunderstanding through the use of clarification requests and confirmation checks. In contrast, it was also observed that unfamiliar pairs were less likely to signal instances of non-understanding in the beginning and were also more likely to make use of devices which ensured the smooth continuation of conversation than were the familiar pairs. According to this study, it seems that interlocutor familiarity is another factor which leads to an increase in negotiation.

So far, this paper has documented research which has attempted to isolate variables which encourage the negotiation of meaning, namely the ideal tasks and interlocutors. Although research is still needed in these areas, this prior work can serve as a guideline for studies which branch off to investigate other variables that may encourage or discourage negotiation of meaning, specifically the medium through which these tasks are performed.

**Computer Mediated Communication in the L2 Classroom**

An area of Computer Assisted Language Learning which is concerned with the role the medium of communication plays in learner interaction in the L2 classroom is Computer
Mediated Communication (CMC). As illustrated in Table 2.3, research into the various mediums of CMC has attempted to unearth discourse features, language learning behavior, technical constraints, and student attitudes of participants in CMC tasks. However, little research has been done into communicative tasks that are appropriate to the various mediums CMC offers. In the following subsections, I will detail investigations into the three different mediums of CMC: asynchronous written communication, synchronous written communication, and synchronous oral communication.

**Asynchronous Written Communication**

Asynchronous CMC in the form of e-mail has been utilized to link L2 learners with native speakers and other learners much in the same way pen-pal projects of the past did. The technological factor involved, computerized delivery, enables messages to be sent and received much more quickly than the normal postal service allows. However, faster delivery time does not place the same pressure on learners to respond immediately to questions and comments that real-time communication imposes. As a result, learners are able to consult dictionaries, monitor their writing, and edit out mistakes before submitting their responses. This time delay in responding might also provide learners with the chance to compose longer and more complex responses.

One study which attempted to investigate the effects of asynchronous CMC on classroom learning surveyed students and instructors in German classes at two American universities who had participated in an regular e-mail exchange (Van Handle & Corl, 1998). According to the instructors surveyed, the e-mail exchanges had various effects on the students' writing and speaking, including greater use of risk-taking strategies in class, richer oral interaction,
an increase in the use of vocabulary and structures found in reading assignments, and better written compositions.

Another study that involved asynchronous CMC, which relied less on participant feedback and more on direct observation, looked at language input and modification that occurred via an online message-board used to link students and tutors in a distance education French program (Lamy & Goodfellow, 1999). The researchers were specifically interested in locating instances of reflective conversation, interactions which focus on language and language learning, as a source of input-modification and social-interaction. Students and tutors corresponded with one another via the message-board to help one another or seek advice on completing their assignments thereby facilitating the use of reflective conversation. Analysis of the exchanges indicated that reflective conversation did in fact lead to negotiation of meaning and focus on form sustained over time for some kinds of tasks.

**Synchronous Written Communication**

A comparative study by Sotillo (2000) investigated the discourse functions and syntactic complexity produced by ESL learners in an asynchronous text exchange with those produced by ESL learners in a synchronous text-chat. Monitoring the discourse functions produced in each medium, she found that asynchronous CMC was less varied than synchronous CMC in the type of discourse functions used and followed more of a question-answer format while synchronous CMC had more resemblance to face-to-face conversations. This finding would seem to verify an earlier study by Chun (1994) which also found that learners in a synchronous CMC text-discussion made use of a wide range of interactional speech acts, including giving feedback, asking for clarification, and ending discussions.
<table>
<thead>
<tr>
<th>Study</th>
<th>Medium (Format/Software Used)</th>
<th>Time Factor</th>
<th>Participants</th>
<th>Features Investigated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chun 1994</td>
<td>Written Text-chat (InterChange)</td>
<td>Synchronous</td>
<td>14 students in the first and second semester of German at an American university.</td>
<td>Amount of participation by individual students and the type of language used.</td>
</tr>
<tr>
<td>Kern 1995</td>
<td>Written Text-chat (InterChange)</td>
<td>Synchronous</td>
<td>40 students in second semester French at an American university.</td>
<td>Differences in discourse function, syntactic features, participation and L1 used in a CMC discussion and a traditional face-to-face discussion.</td>
</tr>
<tr>
<td>Sullivan &amp; Pratt 1996</td>
<td>Written Text-chat (InterChange)</td>
<td>Synchronous</td>
<td>38 students in an intermediate ESL class at a Puerto Rican University.</td>
<td>The effect using computers in a composition class and apprehension or attitudes toward computers had on the quality of writing.</td>
</tr>
<tr>
<td>Warschauer 1996</td>
<td>Written Text-chat (InterChange)</td>
<td>Synchronous</td>
<td>16 students in an advanced ESL composition class at an American community college.</td>
<td>Differences in levels of participation and students’ attitudes between a CMC discussion and a traditional face-to-face discussion.</td>
</tr>
<tr>
<td>Lee 1998</td>
<td>Written Text-chat (Online Chatrooms)</td>
<td>Synchronous</td>
<td>31 students of Spanish in a fifth semester university class paired with either native Spanish speakers or other Spanish learners.</td>
<td>Students’ comfort level in using an online chatroom to converse with native speakers and their perceptions of the usefulness of these chats.</td>
</tr>
<tr>
<td>Study</td>
<td>Medium</td>
<td>Time Factor</td>
<td>Participants</td>
<td>Features Investigated</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----------------------------</td>
<td>-----------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Van Handle &amp; Corl 1998</td>
<td>Written &amp; E-mail</td>
<td>Asynchronous</td>
<td>Two intermediate German classes at two American universities.</td>
<td>Whether e-mail exchanges would help improve students' L2 speaking and writing.</td>
</tr>
<tr>
<td>Donaldson &amp; Kotter 1999</td>
<td>Written &amp; Text-chat (MOO)</td>
<td>Synchronous</td>
<td>American university students of German in their fourth semester and German evening school students of English.</td>
<td>Percentage of L1 and L2 used, amount of code-switching in NS/NNS tutoring sessions, and the success of mentoring/tutoring.</td>
</tr>
<tr>
<td>Lamy &amp; Goodfellow 1999</td>
<td>Written &amp; Online message-board (Lexica Forum)</td>
<td>Asynchronous</td>
<td>10 upper-intermediate students of French in a distance education program.</td>
<td>Amount of linguistic reflection which occurred in the exchanges.</td>
</tr>
<tr>
<td>Pellettieri 2000</td>
<td>Written &amp; Text-chat (Ytalk)</td>
<td>Synchronous</td>
<td>20 intermediate students of Spanish at an American university.</td>
<td>Whether task-based synchronous text-chat would help learners develop grammatical competence through negotiation of meaning and form.</td>
</tr>
<tr>
<td>Sotillo 2000</td>
<td>Written &amp; Text-chat vs. Online message board</td>
<td>Synchronous &amp; Asynchronous</td>
<td>University ESL writing classes.</td>
<td>Comparison of discourse and linguistic features found in synchronous and asynchronous CMC.</td>
</tr>
<tr>
<td>Zähner, Fauverge &amp; Wong 2000</td>
<td>Spoken &amp; Written &amp; Videoconferencing &amp; Text tool</td>
<td>Synchronous</td>
<td>28 EFL and 16 FFL students at French and British universities.</td>
<td>The technical and physical constraints and needs of using a high bandwidth network to carry out CMC tasks.</td>
</tr>
</tbody>
</table>
In order to examine syntactic complexity, Sotillo evaluated the production of T-units, "the shortest unit which a sentence can be reduced to, and consisting of one independent clause together with whatever dependent clauses are attached to it" (91). The T-units produced during synchronous CMC were less complex than those produced during asynchronous CMC, indicating that synchronous CMC seems to encourage fluency over complexity, another similarity to oral communication.

As Sotillo's study indicated, language produced during synchronous CMC shares similar discourse and syntactic features with oral communication. However, research has shown that class discussions conducted via synchronous CMC and through face-to-face oral discussion differ in other features (Kern, 1995; Sullivan & Pratt, 1996; Warschauer, 1996). With respect to student participation, Kern found that discussions conducted over Daedalus InterChange, a local area network text-discussion application, enabled a greater number of responses than in an oral discussion. One reason for this difference in interaction was attributed to the fact that text-based discussion permitted overlapping comments from students in a style which would have been considered interruptive or rude in oral discussions. This higher amount of participation also seemed to be facilitated by the relative degree of anonymity afforded students during CMC discussions. Warschauer's study, which considered student attitudes and self-confidence in accounting for different levels of participation in the two mediums, found that CMC discussions had an equalizing effect on student participation. During CMC discussions, students who regularly participated little in oral class discussions, perhaps due to lack of confidence in their speaking abilities, achieved almost equal participation with students who regularly had high levels of oral participation.
Another factor present in CMC discussions which also influenced student participation was the reduced role of the teacher. In recording the amount of turns taken by the teacher in both a large group CMC discussion and oral discussion, Sullivan and Pratt found that teacher turns were far fewer in CMC discussions. The oral discussion was far more teacher-driven with the instructor asking and answering questions, responding to students, repeating students’ comments, making her own comments or otherwise directing the discussion. In contrast, the students in the CMC discussion seemed to guide the discussion themselves and asked and answered more questions, thereby reducing the need for teacher participation or direction.

Other aspects of CMC discussions which have been analyzed include the percentage of L1 and L2 used during NS/NNS discourse (Donaldson & Kotter, 1999) or the comfort levels and attitudes of students with respect to the effectiveness of synchronous CMC discussions with native speakers (Lee, 1998). Both these studies made use of qualitative data obtained through questionnaires; Donaldson and Kotter’s attempted to account for L1 and L2 language use and code-switching which occurred while Lee’s data was acquired from a questionnaire which measured student attitudes and apprehension. Yet, both reveal how synchronous CMC has changed the nature of the L2 classroom by allowing learners to interact with native speakers from the outside world in real-time discussions.

The final study making use of synchronous written CMC included in Table 3 is one which clearly attempts to bridge a gap between SLA research and CMC. By making use of a text-discussion application Pellettieri (2000) analyzed discussions between pairs of students who completed various tasks over the network to observe whether negotiation of meaning
occurred in CMC interaction and whether negotiation facilitated comprehension and helped learners develop grammatical competence. By analyzing the collected texts from the chatting sessions, she was able to code examples of triggers in all tasks, which indicated that negotiation took place in text-chat much as it does in oral communication. In addition, the transcripts created of the students’ chat-sessions illustrated how students often left the main thread of discussion in order to clear up misunderstandings that hampered their ability to complete the tasks. Although such detours often took them far from the task at hand, the students followed through on misunderstandings until both partners were able to comprehend each other.

With respect to whether network-based CMC would facilitate development of grammatical competence, she observed that students used negotiation not only to modify meaning, but also to modify form. Lack of understanding or clarity, which resulted from the use of incorrect forms, made task completion difficult. As a result, somewhat extensive negotiation took place to resolve these misunderstandings.

Analysis of the transcripts produced during the sessions also revealed that negotiation did induce corrective feedback and the incorporation of target-like structures in the students’ communication. *Ytalk*, the software used in this study to facilitate synchronous chatting, included a feature that recorded all keystrokes made by the students and enabled the researcher to note all instances of correction. As a result, Pellettieri found high percentages of the incorporation of target-like forms in response to both explicit and implicit feedback, 70% and 75% respectively. She attributed this finding to the additional processing time text-chat permits in contrast to oral conversation.
Synchronous Oral Communication

To date, most research in CMC has utilized applications which make use of text-based discussions, such as InterChange, MOOs or e-mail. However, as computer technology becomes more comprehensive, better and more affordable applications which support oral CMC will find their way to the L2 classroom. Already, a recent study called the LEVERAGE project in Europe observed classes of language students in England, France and Spain linked via an audiovisual network to collaborate in small groups on tasks (Zahner, Fauverge & Wong, 2000). Data collected in the form of video-recordings, which were later transcribed, permitted interaction analysis of turn-taking and the amount of time spend on the system. This same data also provided information for discourse analysis to reveal which languages dominated, where peer tutoring took place and in what form. When analyzed from a pedagogical perspective, the data also revealed to what extent certain online resources, such as the text-chat tool, were accessed. Interestingly, although videoconferencing enabled participants to see and hear one another, much like in face-to-face oral communication, lack of physical proximity necessitated using textual CMC as well. Zähner et al. concluded that high-bandwidth networks alone do not support collaborative learning but are dependant upon the tasks developed, the technical stability of the network, access to an advisor, and access to a text-chat tool to augment successful collaboration.

Major Findings

Studies concerning task features and their effect on the negotiation of meaning clearly indicate that certain types of tasks more successfully facilitate negotiation work than do
others. Specifically, tasks which require participants to both supply and request information in order to arrive at one correct outcome are more likely to lead to negotiation of meaning than tasks which possess different parameters. Furthermore, task participants also influence the amount and type of negotiation which occurs during these tasks. NS-NNS dyads were found to produce more negotiation routines than NNS-NNS dyads just as interlocutors who were familiar with one another were more likely to indicate lack of comprehension or understanding, thereby initiating negotiation, than were interlocutors who were less familiar with one another. Useful as this research is for L2 instructors designing and organizing tasks for the classroom, it may not be as useful for instructors designing CMC tasks for the computer-enhanced classroom in which the medium of communication is not necessarily oral or face-to-face.

Recent CALL studies have begun to unearth distinct features of CMC discussions which differ from traditional face-to-face discussions. Features such as the equalization of participation, the minimization of teacher-talk, and the discourse similarities between synchronous text discussions and oral conversation have appeared in several studies, indicating that research in these areas has identified characteristics that appear to be associated with the medium. However, fewer studies have attempted to bridge the gap between the interactionist theory of SLA and tasks which facilitate negotiation of meaning via a computer-mediated medium. The work of Lamy and Goodfellow, which found that asynchronous written exchanges that focused on topics related to language and language learning facilitated reflective conversation, and Pellettieri’s study of negotiation of meaning,
which occurred during the completion of tasks via synchronous text-based CMC, are two studies which begin to fill this gap.

Nevertheless, both studies are limited to text-based CMC and cannot provide insight into the possibilities for negotiation of meaning which may occur during tasks carried out via oral CMC. For one, the speed of an oral exchange far outpaces the speed of a written exchange, allowing for more interaction in a shorter time. With more total interaction, learners may encounter more opportunities to negotiate for meaning. In addition, text exchanges obviously focus a learner’s attention on lexical and grammatical understandings that occur due the learner’s reading and writing ability. However, an oral format would stress the speaking and listening ability of the learner. As a result, misunderstandings resulting from pronunciation issues and speed of comprehension in addition to grammatical and lexical misunderstandings could lead to even more opportunities for negotiation of meaning and conceivably more opportunities for second language acquisition.

**Implications for Future Research**

Few studies have addressed the gap between research in SLA which focuses on task-induced negotiation of meaning and CALL research which considers the impact CMC has on facilitating or impeding negotiation of meaning. Until now, prior research in this area has looked at text-based communication and found that negotiation does occur in CMC-based tasks. However, the accessibility of network based communication and the development of computer applications which permit synchronous oral communication have opened up another medium for CMC tasks in the L2 classroom. Teachers who wish to make use of this
new medium to bring more authentic language use into the classroom will need to develop appropriate tasks which take advantage of this technology to help students develop comprehension and grammatical competency and oral fluency.

Unfortunately, current research does not yet address the needs and concerns most teachers would have in trying to select appropriate tasks. Are the task types and task features which facilitate the negotiation of meaning in face-to-face discussions equally effective in real-time oral CMC? What impact will physical distance between partners and the lack of visual cues have on the students’ ability to achieve comprehension? How might technical constraints or sound-quality issues facilitate or impede negotiation or comprehensibility? To what extent will students still rely on text-based communication even while performing tasks via a network-based speaking application? What level student or what types of dyads would benefit most from this type of interaction?

This study attempts to investigate some of these questions by looking at what kinds of negotiation of meaning occur between dyads attempting to complete both a jigsaw and a decision-making task using an application which permits both spoken and written CMC. In the following chapter, I will address the process of data collection and analysis including task design and rationale, the selection and characteristics of the participants, the role of the researcher, and the specific methods of analysis used for this study.
CHAPTER 3. METHODOLOGY

This chapter, which addresses the methods used in gathering data for this study, is divided into four main sections: task design, description of subjects, procedure, and analysis. In the first section, task design, I will describe the research and rationale which influenced the two particular tasks created for this study and the modifications made as a result of the pilot study. The second section will address the language abilities and personal characteristics of the eight participants in this study as well as my rationale for selecting them. The third section will describe the methods I used in gathering my data, specifically questionnaires, interviews and the task trials themselves. The specific data-gathering instruments can be found in the accompanying appendices where noted. Finally, I will describe the criteria I established for counting turns and determining the occurrence of negotiation of meaning with reference to prior work in negotiation of meaning upon which I developed these criteria.

Task Design

The desire to create and evaluate communicative CMC tasks for actual classroom use in university level EFL classes in both Japan and Korea was the guiding motivation throughout the task-design process. The criteria I established for both tasks used in this study was based in part on prior research in second language acquisition (Doughty & Pica, 1986; Gass & Varonis, 1985; Pellettieri, 2000; Pica, Kanagy & Falodun, 1993; Pica, Lincoln-Porter, Paninos & Linnell, 1996) which looked at characteristics of tasks that
induced interaction or best facilitated the negotiation of meaning. Being unable to find such tasks that also required students to make full use of the resources available in a CALL classroom forced me to create original network-oriented tasks. Another aspect fueling task-design was the desire to create tasks that might help prepare EFL students for a semester abroad or further study at a university in the United States.

Theory and Prior Research in Task-Type

Pica et al. (1993) defined a type of task that would ideally provide learners with the most opportunities for input comprehension, production feedback, and language modification as one in which both interlocutors possess information necessary for task completion, both are required to request and supply this information, and both have the same or convergent goals to reach only one appropriate outcome. This type of communicative task has been labeled a jigsaw task because participants each possess a different part of the puzzle and must share their pieces in order to see the full picture. However, prior research (Gass & Varonis, 1985; Pica, Holliday, Lewis & Morgenthaler, 1989) has found another task type, information gap tasks, to actually lead to similar or sometimes greater amounts of negotiation of meaning than do jigsaw tasks. The main difference between these two task types lies in the flow of information; in info-gap tasks one interlocutor is primarily responsible for supplying information while the other is responsible for requesting information. In other words, the flow of information in an info-gap task is predominantly unidirectional as opposed to the two-way flow of information characterizing jigsaw tasks. Nevertheless, Pellietti’s (2000) recent text-based CMC study involving various types of tasks found that the jigsaw task leads to the greatest number of negotiation routines. Therefore, in order to address my second
research question, one of the tasks used in this study was designed using Pica et al.'s characteristics of jigsaw tasks.

As discussed in the previous chapter, Pica et al. (1993) defined four other communicative task types with potentially lesser degrees of effectiveness in facilitating language modification. In order to test out whether jigsaw tasks do in fact lead to more negotiation of meaning, the second task designed for this study was one of these less facilitative tasks, a decision-making task. Table 3.1 below delineates the specific differences between these two task types.

Table 3.1. A Comparison of Task Features

<table>
<thead>
<tr>
<th>Jigsaw</th>
<th>Decision-Making</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both participants possess information and take turns supplying and requesting it.</td>
<td>Both participants have access to information but only supply it upon request.</td>
</tr>
<tr>
<td>Required 2-way flow of information.</td>
<td>Possible 2-way flow of information.</td>
</tr>
<tr>
<td>Interaction required.</td>
<td>Interaction not required.</td>
</tr>
<tr>
<td>Same or convergent goals.</td>
<td>Same or convergent goals.</td>
</tr>
<tr>
<td>One correct outcome possible.</td>
<td>Multiple outcomes possible.</td>
</tr>
</tbody>
</table>

(Pica et al, 1993)

Although both interlocutors in such a task are in possession of different pieces of information, their respective pieces of information are not fully necessary for task completion. Furthermore, decision-making tasks are also characterized by multiple possible outcomes. As a result of these task characteristics, interlocutors do not have the
same impetus to either volunteer information or ensure complete comprehension, thereby reducing the need for negotiation of meaning.

**Exploiting the CALL Classroom**

Whether face-to-face or CALL-based, prior studies which make use of communicative tasks (Doughty and Pica, 1986; Gass and Varonis, 1985; Long 1983; Pellietieri, 2000; Pica et al., 1989; Pica et al., 1996; Plough and Gass, 1993) have not taken advantage of the resources provided by a networked classroom. Typical jigsaw or info-gap tasks often take the form of describing pictures to determine differences or reorganizing objects on a pasteboard to resemble a picture. More complex info-gaps tasks may take the form of a mystery in which each participant possesses various clues necessary to solving a crime. In one typical decision-making task, speakers each have information concerning different patients in need of an organ transplant and must reach an agreement on who should receive the transplant. Far less structured, opinion-exchange tasks or debates may simply require students to discuss a certain topic. Regardless of task type, all can be completed easily without benefit of the particular resources available in a CALL classroom.

In order to fully exploit CALL resources, both tasks designed for this study required participants to gather information easily available on the Internet. For one task, participants were directed to the admissions websites for two universities in order to find the different pieces of information needed to solve a problem. In the other task, participants needed to make use of various online travel resources in order to budget a business trip. Of course, the same information used in these tasks could have also been acquired by searching through travel brochures and university application materials or
through phone calls to travel agencies and university admissions offices. However, making use of the wealth of information available on the Internet provides students with access to more resources in a shorter time and also gave them the chance to use their language skills in a more authentic manner than some traditional classroom tasks which asked students to draw a picture according to directions.

**The Jigsaw Task – Problem Gradschool**

Problem Gradschool (See Appendix C) is based on the scenario that both participants have a mutual friend in China named Harry whose dream is to study for a Master’s degree in Computer Science at either Stanford or MIT. Unfortunately, Harry suffers from a severe case of low self-esteem and indecisiveness so that he doesn’t think he can be accepted at either school. In an effort to help Harry move beyond his indecisiveness, each dyad must decide which school to recommend to Harry to seek admission to. Accordingly, both members of each dyad possess five different pieces of information about Harry, such as his TOEFL or GRE scores, financial situation, preference for a research assistantship, etc. After researching which of the two schools fulfil these known needs, the dyads have 20 minutes to meet online to share their information and choose one of the schools. Dyads that complete this jigsaw task successfully would find that of these ten total needs, eight are fulfilled by MIT while only six are met by Stanford, thereby making MIT the better school for Harry to apply to.

**The Decision-Making Task – Problem Hawaii**

Problem Hawaii (See Appendix D) operates on the scenario that both partners are writers for a travel magazine which targets an international audience of men between the ages of 20 and 45. One participant typically writes articles that deal with adventure travel
and extreme sports, while the other writes articles that deal with fine-dining and more high culture events. Both writers are being sent to Hawaii for a week to explore attractions and activities that would appeal to their readers. In spite of their very different agendas, they have been allotted a total of US$5000 to share for the entire trip. After spending an hour exploring their respective pieces of travel information and pricing on their own, both partners meet online for 20 minutes to decide upon a budget, which they will submit to their boss. Unlike the jigsaw task, Problem Gradschool, the wide variety of information available online and each participants' resourcefulness means that there are many acceptable answers.

**Authenticity and Usefulness**

Because these tasks were designed for use in university level EFL classes in Korea or Japan, it was my intent to create communicative activities that would provide students with the opportunity to use English in a more realistic and perhaps useful manner. To that end, when designing both tasks, I took into consideration the types of problems these students may encounter when planning to study abroad in an English speaking country, applying to a university program and planning for their trip abroad.

The jigsaw task, Problem Gradschool, gives students the opportunity to investigate two actual university websites to find out about admissions requirements and possible financial aid. Furthermore, the ten pieces of information about Harry and his concerns in applying to the right graduate school that the students had to work with were also based upon the real life concerns of actual international graduate students I have either taught or befriended. In fact, university students in Korea and Japan planning to attend graduate school in the United States would likely have similar concerns.
The decision-making task, Problem Hawaii, was designed to give students the chance to investigate travel, food, lodging, and tourist opportunities in a place none had visited. Although students planning to study at a university in a foreign country could rely on travel agencies and tour packages to help them arrange a trip, not all college towns are tourist centers with accompanying brochures and travel guidebooks. As a result, students who know how to locate maps and information on the Internet can better prepare themselves when planning to study abroad at a little-known university in a little-known city.

**Pilot Study**

After developing the tasks, I determined it was necessary to pilot the questionnaires and task procedure on a sample dyad to test for technical glitches and task weaknesses. I found two volunteers among my acquaintances, a Japanese undergraduate in computer science, who was eager to experiment with voice-chat, and Andy, an American graduate student in management, who was not taking any classes that semester, had a more flexible schedule, and a strong interest in working with international students. However, their availability and willingness to help out were the only characteristics they had in common.

Both pilot study participants differed with respect to computer expertise. The Japanese participant, Sato, owned his own computer and was already familiar with using both voice and text-chat applications in Japanese and English while the American participant, Andy, had never owned a computer and was unfamiliar with either text or voice-chat. Andy’s use of computers had been limited to word-processing, sending E-mail, and browsing the Internet.
Although the pre-trial questionnaire and training session progressed without incident, numerous problems cropped up during the actual task trials which forced me to re-evaluate the characteristic of the participants I would eventually select for the actual study, the role of the researcher, a time limit, and the tasks.

The first of these problems occurred as the participants began to test out Yahoo! Messenger's audio capabilities prior to beginning their first task. Although they were both able to log in to Messenger and text-chat without difficulty, Andy, the off-site participant, could not hear what Sato was saying. Andy was certain that the computer he was using was malfunctioning in some way, but he did not know enough about computer hardware and its accompanying complications to fix it. As I was unable to assist Andy due to his location in a distant building, Andy and Sato were forced to move to different buildings and different sets of computers. Following the task trials, I tried to determine what had malfunctioned on the computer Andy had used initially. This led to the discovery that the external microphone had accidentally been plugged into the headphone outlet, preventing Andy from hearing what Sato was saying. In other words, Andy's lack of familiarity with computers had exacerbated a simple problem. As a result, I decided to use participants in my actual study who owned computers and were familiar enough with computer glitches in order to avoid similar complications.

The second issue the pilot study helped me resolve was the role of the researcher. Concerned that my presence would hinder interaction and negotiation of meaning, during their first task, I sat in the hallway just outside the room where Sato was located. However, after nearly 20 minutes had passed, Sato came outside to ask for assistance because Andy didn't understand the task. Review of the video-tape made during this
session revealed that instead of working on their task, a good deal of time had been spent negotiating task directions. Unfortunately, it appeared that Andy had not bothered to read the directions thoroughly and had come unprepared to solve the problem. He had wanted to use task time to surf the Internet for information while Sato had struggled to keep him on task to arrive at a solution. As a result, I determined that my presence in the room could help dyads stay on task and would prevent frustration and tension between participants.

The third issue the pilot study helped resolve was whether a time limit was necessary. Initially, when designing the tasks, I was unsure of exactly how much time the dyads would require to work on the task. After observing the interaction between Andy and Sato on both tasks and transcribing a total of nearly 80 minutes of conversation, I decided a time limit was necessary. Although the pilot study dyad had trouble arriving at any sort of solution for either task, this appeared to be because they spent too much time off-task or arguing about details. A time limit would have forced them to come to a conclusion sooner and would have made my job transcribing that much more manageable.

The feedback I received from both pilot study participants also helped me modify task directions and content. Andy was particularly concerned that the directions for both tasks were not explicit enough in explaining that each partner had different pieces of information about Harry (Problem Gradschool) or slightly different interests (Problem Hawaii). Accordingly, task directions were modified to make this point more. Sato’s feedback also helped me modify the content for Problem Gradschool. Initially, each participant had been given 8 questions to answer; however, Sato claimed that it had taken
him nearly two hours to comb through MIT’s and Stanford’s various webpages to locate this information. Because I wanted participants to spend no more than one hour doing their homework for each task, I reduced the number of questions to 5 apiece and provided direct links to the universities’ department and admissions homepages to reduce the time spent searching for answers. Furthermore, the questions which were removed from Problem Gradschool were those that were too difficult to find or those that seemed to spark controversy and lead the discussion off-task.

Participants

The eight participants in the actual study consisted of two native speakers of American English and six non-native English speakers, three of whom were native Japanese speakers, and three of whom were native Korean speakers. Due to the large time commitment involved, approximately 4 hours, all participants were selected from a larger group of potential subjects as a result of their availability and willingness to try something new without receiving any form of renumeration. The other characteristics common to all eight participants was that all owned computers and were reasonably familiar with using them on a daily basis. I established this as a requirement for all participants due to the technical nature of the tasks involved and the fact that I could not be in two places at the same time to offer technical support to both conversation partners. The following two subsections will examine the two groups of participants, native English speakers and non-native English speakers, in more detail.
Native English Speakers

Both native English speakers were American male students studying at the Georgia Institute of Technology in Atlanta. One was a third year undergraduate in Electrical Engineering while the other was a graduate student in City Planning. Neither had studied Korean or Japanese, and neither had any experience with teaching or tutoring non-native English speakers. Their ages, 20 and 27 respectively, were comparable to the range in ages among the other participants, 21-28.

In addition to their availability and willingness to participate, these two were selected for this study based on several factors. Due to complications arising during the pilot study, it became clear that without some form of extrinsic motivation such as money or a grade for a class, the NS participants had little to motivate them and subsequently might have been less likely to complete their pre-task assignments or even follow the directions to each task. Because personal budget limitations prevented me from offering to pay, I relied on my knowledge of possible subjects and selected two who were conscientious workers and who could be relied upon to complete their assigned tasks in advance. In addition, because I was interested in experimenting with off-site participants to test out the possible barriers distance may play in completing the tasks, I needed off-site subjects who were very comfortable with computer use and who were already familiar with synchronous chat applications. Both NS participants were selected for this study because they fulfilled these requirements.

Non-Native English Speakers

The non-native English speaking participants represented a somewhat homogeneous group. In designing the two tasks for this study, I envisioned a class of
students at either a Korean or Japanese university learning English for the purpose of studying or working abroad in the United States. In both countries there are English classes dedicated to groups of students with the same major or in the same department, and it was for such a homogenous class that these tasks were designed. As a result, I attempted to select NNS participants with the same major. Due to the large number of Korean and Japanese students majoring in Computer Science, it was relatively easy to find appropriate subjects with this major. Indeed, 5 of the 6 NNS participants were undergraduates in Computer Science; the lone exception was a student in the Intensive English program, who had just been accepted by the university to begin classes the following semester. His intended major was in Hotel and Restaurant Management, but he was added to the study at the last minute to replace a student in Computer Science who was unable to participate. As a result of selecting students from a department in which the majority of students were male, 5 of the 6 NNS participants in this study were also male. In addition to sharing an almost homogeneous background, these students had been using computers for an average of 8 years. All six had prior experience using synchronous text-chat applications in either English or their native languages and were likely to spend on average 4 hours a day at a computer.

With respect to language ability and background, there was slightly more variation. Although the participants most current TOEFL scores were used as a benchmark in gauging their approximate English level, the time between when those TOEFL scores had been achieved and the time of this study varied significantly; four of the participants' TOEFL scores had been received in either late 1999 or early 2000, one student's score dated back to October 1997, and the score of the student in the Intensive
English Program had just been received in October 2000. Nevertheless, TOEFL scores ranged from 500 to 550, and length of residency in the United States ranged from 11 months to 20 months. Because Korean and Japanese students typically study English for six years in Junior and Senior High School, all NNS participants had had at least six years of English study. Three had also benefited from up to a year of English language study here in the United States, and two had studied English for one or two years at university in Korea or Japan as well.

**Procedure**

The procedure used for collecting data consisted of three parts: a pre-trial interview and questionnaire, the actual tasks trials themselves, and a post-trial interview and questionnaire. The procedure was modified from its original form during the pilot study and remained consistent for each of the four dyads.

**Pre-Trial Interview**

After conducting the pilot study and determining a profile for the types of participants I was interested in investigating, I began interviewing potential participants. All interviews with NNS participants were conducted face-to-face, while interviews with the offsite NS participants were either conducted via telephone or through an email exchange. All potential subjects were given the Consent Form (See Appendix A) and an explanation of what was expected of them if they chose to participate. Those who showed an interest in volunteering, after giving their consent, filled out one of two Pre-Trial Questionnaires intended for either NNS or NS participants (See Appendix E). These questionnaires were meant to determine language learning background, language
aptitude, computer experience, familiarity with text or voice-chat applications, comfort level and familiarity in speaking with native or non-native English speakers as the case may be, and teaching experience. Although not all who completed a pre-trial questionnaire and interview eventually participated in the actual study, the data gathered in this manner helped me to pair up participants from different language backgrounds with similar levels of availability.

The Application -- Yahoo! Messenger

In determining which software application to use in the study, two main factors came into consideration, platform compatibility and ease of use. Although most of the participants in the study were using PC’s, one of the participants only had access to a Macintosh. As a result, I needed a chatting application that could be downloaded onto both platforms. Of the three chatting applications I investigated, Microsoft NetMeeting, CheetaChat and Yahoo! Messenger, only the latter two met this requirement.

Ease of use was another significant factor which helped me decide on Yahoo! Messenger as the application of choice. Because I could not physically be present in both on and off site locations during the task trials to offer support or advice on how to use the chatting application, I selected the application that was most straightforward and easy to use. Although CheetChat has voice-chatting capabilities, I found it difficult to establish a voice-conference room. The many pre-organized chat-rooms also made it more overwhelming. In contrast, Yahoo! Messenger’s organization and chatting window seemed more straightforward and novice-friendly. Figure 3.1 is a screen capture of what a typical voice conference window in Yahoo! Messenger looks like.
In cases where it was necessary, the second half of the pre-trial interview included a training session on how to download and use Yahoo! Messenger. Participants who were already familiar with this application or who were located off-site did not receive this additional instruction. Although it had been my original intent to set up a trial run-on Yahoo! Messenger to test out the voice and text chat features, the limited availability of most participants made this difficult. As a result, with the exception of those who had used Yahoo! Messenger before, most participants were only able to test out the features during a 5-10 minute interval prior to their first task.
Organization of Dyads

Due to the potential influence technological and interpersonal familiarity might have on the outcome of tasks and the type of interaction or negotiation of meaning which might take place, the tasks were performed in two different orders by the dyads. In other words, Dyads 1 and 3 completed the decision-making task, Problem Hawaii, first while Dyads 2 and 4 completed the jigsaw task, Problem Gradschool, first. As Table 3.3 indicates, this type of organization also ensured that one of the NNS/NNS and one of the NS/NNS dyads would have the chance to perform either the decision-making or jigsaw task first.

| Table 3.3 Dyad Members and Order of Task Completion |
|-------------|----------------|-----------------|-----------------|
| Dyad        | Participants   | Native Language | First Task      | Second Task     |
| Dyad 1      | Yama<br>Kelly  | Japanese<br>Korean | Hawaii          | Gradschool      |
| Dyad 2      | Callis<br>BB   | Korean<br>Japanese | Gradschool      | Hawaii          |
| Dyad 3      | Ingan<br>Mogador | Korean<br>American English | Hawaii | Gradschool |
| Dyad 4      | Hajime<br>Escort | Japanese<br>American English | Gradschool | Hawaii |

Note. All names in this study are pseudonyms chosen by the participants themselves.

Pre-Task Assignments

Prior to meeting with each other to perform the tasks, all participants were given homework assignments to complete on their own. These assignments, available online, were subdivided into different tasks for partner #1 and partner #2. For the sake of
consistency across dyads, partner #1 was the Adventure Traveler in Problem Hawaii and was also the partner required to answer the first five questions in Problem Gradschool. This also meant that in the NS/NNS dyads, the NNS was always partner #1. Participants were expected to do these assignments on their own to prepare them for their interaction. They were instructed to spend a maximum of only one hour on these assignments and to stop after an hour whether or not they had finished. Unlike the NS participant in the pilot study who either spent too little time on the homework or did not attempt the homework at all, all participants spent at least an hour on their assignments.

Location and Set-Up of Trials

The tasks themselves were conducted for the most part in the students’ own dorm rooms to facilitate a quiet environment for recording and to enable the students to use their own computers. Two exceptions to this set-up occurred: one student in dyad one could not use her computer due to a virus and was forced to use the computer in the researcher’s dorm room, and the NS participant in dyad three used a computer in his office. All computers were equipped with either internal or external microphones sensitive enough to speak through as well as internal or external speakers.

The use of these separate dorm rooms also helped to create a need for CMC instead of face-to-face completion of tasks. Although the distance between the participants’ locations varied; different floors in the same building (dyad one), different buildings in the same city (dyad two), and different states. Iowa and Georgia, (dyads three and four); all were far enough apart to make CMC the only viable means of completing their tasks.
In each dyad, one participant's room was used as the on-site location for collecting data. In all cases, the participant whose room was nearest was where my recording equipment was set-up and where I was located as both an observer and facilitator. In each on-site room, a video camera mounted on a tripod was set up slightly behind the student's chair and off to the side and focused only on the computer monitor in order to record both what was being said and what was being typed on the screen (See Figure 3.2). Although the microphone on the video camera was sufficient enough to record both on and off-site participants' voices, the visual of the computer monitor was nearly impossible to read in spite of the focus, so participants were required to type their messages using a 20 pt. bold font that the camera could record clearly. To further facilitate the collection of written data, a printout was made of the typed exchanges and used during the transcription process.

Following the initial setup of the camera, and log-in to Yahoo! Messenger, participants in each dyad introduced themselves and tested out the text and voice-chat features. This gave each dyad the chance to know a little about their partner as well as the opportunity to troubleshoot for any potential technical problems. Due to the technical expertise of the participants involved and their familiarity with computers and chatting applications, almost all technical problems were resolved before the trials started. The lone exception was in the first trial of dyad two during which both participants were forced to rely on text-chat due to a problem with sound feedback which hampered speaking.
After this introduction and trouble-shooting period, participants were reminded of their instructions and informed that they had 20 minutes to complete the task, at which time the off-site participant would email me their dyad’s solution. All dyads were informed when they had approximately 2 minutes left. In most cases, the dyads were stopped at 20 minutes whether they had reached a solution or not. At the end of the first task, participants were given their second assignment and were instructed to choose a time when they could both meet to complete the second task trial. The second task trial took place within one week of the first.

The Role of the Researcher

The role of the researcher during the task-trials was threefold: camera operator, observer, and facilitator. These three roles potentially had some sort of influence not only on data collection and analysis, but perhaps also on the type and quality of data.
produced by the participants. Unfortunately, this study did not determine the degree to which the researchers presence influenced or distracted on-site participants during each session.

The presence of a camera-operator was necessary because someone needed to be present to monitor the camera to insure that it did not malfunction. Unfortunately, the camera did have an infrequent tendency to shut off for no apparent reason. Although this occasional malfunction sometimes resulted in unrecorded turns, my presence prevented the loss of significant amounts of data or even entire sessions.

Being present in the room also enabled me to observe participant behavior not recorded by the camera, which helped to explain long lapses in silence or misunderstanding which might have occurred for reasons non-linguistic. Although I could not observe off-site students, the behavior of the on-site students provided me with clues as to what was impeding or slowing communication, for example slow typing speed, or mathematical computation being carried out on paper instead of the computer screen. These instances were made note of and used when analyzing data to help determine whether negotiation of meaning was taking place or whether some other sort of negotiation was occurring. The data collected during observation also helped me to refine my questions and comments during the post-trial interview conducted with each participant.

The third role of the researcher, that of facilitator, was meant to represent the role of a teacher during classroom pair-work activities. Because these tasks were designed with the intent of being used in an EFL classroom, in which a teacher would be able to help keep students on task and provide crucial assistance, I decided that it was also
necessary that my participants have the benefit of such a teacher. In fact, results of the pilot study, during which the participants were left to their own devices, showed that without guidance, they were likely to get off task or spend much of their time negotiating task directions, not meaning. In order not to interfere with negotiation of meaning and task completion which might occur between the participants, I limited my involvement. This meant that when students appeared to be going off task or struggling unduly with their instructions, I intervened. Similarly, if a student asked me a direct question, such as clarification of directions or the partner's name, I responded. However, if the question directed toward me appeared to be an attempt at negotiation of meaning, I prompted the student to ask his or her partner for help. For the most part, participants seemed to ignore my presence as they concentrated on the task. Nevertheless, the presence of a native English speaking observing might have had an impact on the results of this study although the exact impact was not investigated or discussed during the post-task interview.

**Post-Trial Interview**

Following the completion of the second task, I used one of two post trial questionnaires (See Appendix F) to interview each participant to gain their feedback on the procedure and to ask any questions about their behavior or responses during the tasks. These interviews were conducted within the two weeks following the completion of the second task. The interviews with the NNS participants were conducted face-to-face while the NS participants completed the questionnaire on their own and answered my questions via a telephone interview. Although the videos of the task trials had not been transcribed yet, I used the printout of the written exchanges and my own notes to help
participants remember the particulars of each task. In spite of the time which had passed, all participants were able to recall the specific tasks clearly and were able to provide insightful responses to my notes and questions.

**Analysis**

This study attempts to seek both qualitative and quantitative results to the questions posed. While questionnaires, observations and interviews were used to collect more ethnographic information, prior work in analyzing the negotiation of meaning, and statistical analyses were used to arrive at the quantitative results.

**Unit of Analysis**

The first challenge I faced was in determining what unit to use for the basis of evaluating the amount of oral language used and the amount of negotiation of meaning that took place. Although it had been my original intent to count words when determining oral interaction, as I began analyzing transcripts, word counts did not appear to adequately address what I saw. As is the case with written and spoken language, more can be said in a shorter amount of time than can be written, particularly if one is a slow typist. However, comparing the number of spoken words with the number of written words would not have been as revealing at comparing the turns. In other words, by using turns as the unit of measurement, I could better see how much of the interaction was carried out in written and spoken forms, and which was the preferred mode of communication for transmitting certain types of information or negotiation of meaning.

Due to the slower and more deliberate nature of turn-taking during voice enabled CMC, turns were generally clear cut and easy to observe. For the most part, participants
had to click the green “Talk” button in order to speak (See Figure 3.1, p.38). As they spoke, a green volume monitor lit up to indicate to both users who was speaking. This visual cue assisted in preventing most interruptions that would normally take place in face-to-face or telephone conversations. However, the general set-up, lack of visual cues, and text-chat capabilities sometimes meant that one participant could take more than one turn in a row. This can been seen in the following example where Escort, the American participant in Dyad 4 is speaking about the final budget in Problem Hawaii. After his first turn, he is silent for a while as he calculates the total. His partner, Hajime, is also busy doing math and doesn’t bother to respond or even acknowledge that he understood what Escort was doing. After doing the math, Escort then takes a second turn.

Escort: Yeah, I think from what we stated, we fall within the limit of under $5000. What you posted up here, I go ahead and calculate it up real quick.

Okay what you’ve given me, all the prices you’ve listed on the screen, it comes to a total of $1656.69, so yeah, we fall within the $5000 limit, and I think we’ve got a good budget here for Shannon.

As stated above, the text-chat feature also enabled multiple turns. Some participants used the text-chat to type up questions before discussing them or to list key points. In other cases, the text feature was used to keep track of the ongoing budget. Mogador, the American participant in Dyad 3, supplemented his spoken turns with textual turns when doing Problem Gradschool. (Italics indicate written turns.)

Ingan: But, I, there is not my question, but I think MIT doesn’t admitted spring semester, right?

Mogador: Right. It’s, it’s fall for both.

He can’t start in January, so he has to start in the Fall.
In other instances, multiple written turns were used by slower typists to divide longer typed comments to keep their partners from becoming impatient or worried that communication had been lost. Yet more commonly, multiple turns were taken when the writer recognized a spelling or typing error and sent a second, correct version. This can be seen in the example below by Callis, the Korean participant in Dyad 2, when he responds to a question posed by his partner. Callis's original response takes the form of a question, but he rectifies this mistake in his next turn.

BB: *I don't know why hiking is $650*

Callis: *Is it for 6 day*

*It is for 6 days*

The turns that were excluded from being counted and analyzed in this study were those taken by the researcher or between the researcher and the participants. Technical problems, sound difficulty and timing constraints sometimes meant that participants needed to confer with the researcher. However, since this study was intended to see which task facilitated the most oral interaction and negotiation of meaning between dyad members, I was not interested in analyzing the interaction between participants and the facilitator/researcher.

Determining Negotiation of Meaning

The next problem I faced in determining how to analyze the transcripts was to define negotiation of meaning. Previous research and theoretical work in this area (Ellis, 1994; Gass & Selinker, 1994; Gass & Varonis, 1985; Varonis & Gass, 1985) helped me define negotiation of meaning for this study; attempts by the participants to clarify, correct, or overcome linguistic misunderstandings. Although these misunderstandings
were not further categorized, they did include both spoken and written misunderstandings or attempts at solution. As a result of the mathematical nature of Problem Hawaii, attempts to negotiate the meaning of numerical values were also included.

The model for identifying negotiation of meaning as described by Varonis and Gass (1985) was instrumental in helping both raters tag these routines to determine their beginning and end. In this model, four main segments to each negotiation routine are identified, trigger, indicator, response, and reaction to the response. Table 3.4 below defines these four parts.

<table>
<thead>
<tr>
<th>Trigger</th>
<th>The initial word or utterance which initiates the misunderstanding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator</td>
<td>The Listener’s signal that something was misunderstood.</td>
</tr>
<tr>
<td>Response</td>
<td>The Speaker’s response to the Listener’s signal.</td>
</tr>
<tr>
<td>Reaction to the Response</td>
<td>The Listener’s reaction to the Speaker’s response.</td>
</tr>
</tbody>
</table>

(Varonis & Gass, 1985)

The following routine, which occurred during Dyad 3’s completion of Problem Hawaii fits this four step pattern nicely. Ingan triggers the routine when trying to explain his total budget. Mogador indicates a misunderstanding by asking for confirmation of what he thinks Ingan meant. Ingan’s response and Mogador’s reaction conclude the routine, enabling the pair to continue with the task.

Ingan: Okay. My budget is over than $1000 except the airplane ticket and hotel fee.
Mogador: Um, a total of 1000?
Ingan: Uh-huh, yes.
Mogador: Okay. Um, do you know if you were going to stay on one island or if you were going to go to some of the other islands?

However, a delay in reacting to the initial trigger was sometimes observed when the trigger was written not spoken. The following example from Dyad 1, Problem Hawaii, demonstrates how Kelly’s typed statement doesn’t receive immediate attention from Yama until both have taken two more turns.

Kelly: \(15 \times 10 = 150; \text{Maximum price (Trigger)}\)
Yama: Meal, okay. 5 days, 3. 15, 15 times.
Hey, Kelly?
Kelly: We can pay less than 10 dollar per meal.
Yeah.
Yama: Pay less than 10 dollar. What is the 10? 15 times, 15 times 10? (Indicator)

As a result of this observed delay, when determining the number of turns involved in negotiation of meaning, the turns between the trigger and the indicator were not counted as part of the negotiation routine.

My working definition of negotiation of meaning was also refined to exclude misunderstandings and negotiation routines which occurred for the following reasons, some of which were due to the foibles of the technical medium being used to communicate: (1) inaudibility, (2) technical problems, (3) task misunderstandings, (4) outside distractions - telephone calls, interruptions by the researcher, (5) overt misunderstandings that were ignored.

Raters

Rating to determine the number of turns taken was performed solely by the researcher based on the guidelines explained in the previous section. However, since
determining instances of negotiation of meaning and the actual length of negotiation routines proved to be more complex than determining what constituted a turn, two raters, the researcher and a second rater, evaluated the transcripts.

The second rater, a fellow graduate student, was briefed using the definition of negotiation of meaning, which excluded misunderstandings caused by the technical problems, outside distractions, and task misunderstandings outlined above. She was also provided with examples of negotiation of meaning from Varonis and Gass (1985) as well as their model of a negotiation routine. The two raters used these criteria in a practice session to evaluate a portion of one of the pilot study transcripts. Each rater read through the transcript and marked potential negotiation routines. After this initial rating, both raters viewed the video of the actual session to verify whether the marked passages were in fact negotiation of meaning routines or some other negotiation routine caused by a technical difficulty or task misunderstanding. Both raters shared their results and discussed where they thought each routine began and ended. This practice session exposed both raters to the potential difficulties in determining negotiation of meaning and prepared them to evaluate the transcripts from the actual task trials.

Following the rating of each session, both raters shared their results. To ensure reliability, only the routines both raters recognized as negotiation of meaning were evaluated in this study. Both raters marked each routine for a Trigger, Indicator, Response, and Reaction to the Response. In almost all cases, the raters identified identical items in each agreed-upon routine. In the rare instances of disagreement, the raters debated until a consensus was reached.
Statistical Methods

As can be expected, particularly when looking at spoken language, native English speakers when coupled with non-native English speakers at this level had a tendency to speak more or write more than their partners did. As a result, in order to determine the amount of interaction taking place between partners, the give and take of a their problem-solving and not just the number of words being used, the transcripts were analyzed for the number of turns produced during each session. These turns were also subdivided and categorized according to whether they were written or spoken.

Afterward, the number of spoken turns, written turns, total turns, and the number of turns dedicated to the negotiation of meaning were analyzed using chi square tests because of the small sample size. It became apparent that technical differences among the dyads made it necessary to conduct separate chi square tests for each dyad with respect to which task fostered more spoken, written, and total turns, and more turns dedicated to the negotiation of meaning. In addition, a further chi square test was used to evaluate whether significantly more negotiation of meaning occurred during the first task that the two NS/NNS dyads performed than during the second task. The p value was set to \( p < 0.0029 \) as a result of the Bonferoni correction test for multiple statistical analyses (17 at the 0.05 level).

The following chapter will present the results of the task trials and outline statistical results. These results will be analyzed with respect to the task observations, participant questionnaires and follow-up interviews in order to answer the five research questions proposed earlier (p. 3).
CHAPTER 4. RESULTS AND DISCUSSION

This study investigates the relative success of two communicative tasks in fostering oral language production and the negotiation of meaning when conducted via an Internet voice-chat application. Of relevance to determining the success of these tasks, both quantitative and qualitative data were collected and analyzed. In this section, both types of data will be presented and discussed to answer my five research questions in order to shed light on the effectiveness or usefulness of such tasks as CMC tasks in the foreign language classroom. For the sake of organization and clarity, this chapter has been divided into six individual sections, one for each research question, as well as a concluding section, which attempts to draw together the results of each research question to provide a thorough picture of both tasks.

Quantity of Spoken and Written Language Produced

The first research question asks whether the type of task influenced the amount of spoken and written language produced by learners of English. First, total turns produced by each dyad during the task trials were examined to determine whether one task or the other seemed to lead to more overall interaction. Afterward, the total turns were divided into spoken and written turns and analyzed separately to see if one task or the other required participants to rely on more written interaction at the expense of spoken interaction.
However, the initial examination of total turns revealed that Dyad 1 far surpassed all other dyads in turn-taking, particularly during the decision-making task, Problem Hawaii. In fact, the number of turns taken by Dyad 1 during Problem Hawaii, 261, was between two to three times the number of turns any other dyad took during the completion of either problem. This extreme difference was caused in part by the use of the “Hands Free” option, which only Dyad 1 was able to take advantage of. This option meant that Dyad 1’s microphones were voice activated and that neither participant had to rely on a mouse click to activate the microphone. As a result of this discrepancy in technology, Dyad 1’s turns were analyzed separately from Dyads 2, 3, and 4 with respect to total turns, spoken turns, and written turns. The following subsections will discuss the results of chi square tests run on the three mouse click dyads followed by the results of the “Hands Free” dyad.

**Total Turns**

The results of the chi square test in table 4.1 show that there was no significant difference in the number of turns produced by Dyads 2, 3, and 4 during either the jigsaw task or the decision-making task. These results indicate that both types of tasks led to equal amounts of interaction within each of the three dyads that were required to click the “Talk” button each time they wished to speak. However, the chi square test used on Dyad 1 did reveal a significant difference in the total number of turns produced. As indicated in Table 4.2, Dyad 1 produced more than twice as many turns during the decision-making task than during the jigsaw task.

Although the participants in Dyad 1 were less active during Problem Gradschool, they still managed to produce 23 more turns than the most active dyad in the mouse-click
group, Dyad 2, the other NNS dyad. As explained earlier, of the four dyads, only Dyad 1 was able to use the “Hands-Free” option in Yahoo! Messenger. During the task trials, it was observed that this “Hands-Free” set-up meant that the participants of Dyad 1 were able to make use of more conversational continuants or utterances which indicated understanding or signaled that one partner was still processing what the other had said. During observation of the other three dyads, it was noted that occasionally, the on-site participant would utter an “okay” or “uh-huh” without pressing the “Talk” button. This

Table 4.1 Total Turns for Dyads 2, 3, and 4

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Gradschool (Jigsaw)</th>
<th>Hawaii (Decision-Making)</th>
<th>χ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyad 2</td>
<td>96</td>
<td>93</td>
<td>0.048</td>
</tr>
<tr>
<td>Dyad 3</td>
<td>84</td>
<td>98</td>
<td>1.027</td>
</tr>
<tr>
<td>Dyad 4</td>
<td>78</td>
<td>74</td>
<td>1.003</td>
</tr>
</tbody>
</table>

Note. df=1, p<.0029

Table 4.2 Total Turns for Dyads 1

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Gradschool (Jigsaw)</th>
<th>Hawaii (Decision-Making)</th>
<th>χ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyad 1</td>
<td>119</td>
<td>261</td>
<td>26.532</td>
</tr>
</tbody>
</table>

Note. df=1, p<.0029

1 Yama in particular had a habit of reading aloud anything Kelly had typed to him. Although reading aloud may have been necessary for him to process the messages appearing on the screen, it also served to indicate to Kelly that Yama was trying to follow her input. In addition, it helped to fill the silence that could have otherwise been interpreted as misunderstanding by Kelly since she could not see what he was doing. Furthermore, it held Yama’s place in the conversation so that he could jump in with a question before Kelly moved on to her next turn.
typically occurred when the on-site participant was in the middle of typing a message. As a result of the cumbersome nature of having to use the “Talk” button, fewer such continuants or signals were used in Dyads 2, 3, and 4.

Although the members of the three mouse-click dyads might have been able to interact more had they also allowed their microphones to be voice-activated. Unfortunately, “Hands-Free” was not an option for these three dyads. In most cases, the volume of the speakers on each computer had been set relatively high in order to make sure the participants could catch everything being said. When participants used the “Hands-Free” option, this high volume had a tendency to activate the microphone, particularly if the participant was using both the internal speaker and microphone common to a laptop computer. Consequently, using the “Hands-Free” button resulted in a feedback loop. To prevent this feedback loop from occurring, participants were asked to click the “Talk” button whenever they spoke instead of using “Hands-Free”.

In Dyad 1, however, two factors led to their ability to use this more convenient option. Yama, the offsite participant, wore headphones. Naturally, this prevented his microphone from being activated in a feedback loop. The second factor that led to this situation was the set-up of Kelly’s microphone and computer. As the on-site participant being recorded by the video-camera, headphones were not an option. However, she did make use of an external microphone that was directed toward her mouth and away from the internal speakers of the laptop computer she was using. Furthermore, the particular laptop she was using was an older model with less powerful speakers. Even at high volume, which was loud enough for the video-camera to record, the internal speakers were still not strong enough to activate Kelly’s external mic.
The numbers in Table 4.1 also fail to explain two other factors which possibly led to fewer turns during some of the other sessions. Technical problems or user error meant that more than half of Dyad 2's turns were written, not spoken, especially during their first task, Problem Gradschool. In spite of clicking the "Talk" button, this dyad continued to encounter some sort of feedback problem from time to time, which forced both participants to resort to the text-chat option. Slower typing speed meant that it took longer for these participants to exchange information with one another. In addition, the fact that grammar and spelling mistakes became painfully obvious in written form meant that the participants took even longer to respond to one another due to the amount of time they spent on editing and being more careful with their language. It is possible that without the technical issues that forced Dyad 2 to rely on typing as opposed to speaking, they may have been able to take more efficient turns and interact more.

On the other hand, it is also possible that more efficient turn-taking would have led to the situation Dyad 3 faced when completing Problem Gradschool; they finished early. In all other situations, the dyads completed each task or were forced to stop between 20 and 22 minutes. However, Dyad 3 managed to complete Problem Gradschool correctly in only 11 minutes. Despite their speed, they still managed to complete 84 turns, only 14 less than they produced doing Problem Hawaii.

In addition to the technical issues or speed of short time needed for completion, not being able to use a voice-activated microphone might have also influenced the total turns produced by hindering the number of spoken turns each dyad could take. In the follow subsection, I will look at spoken turns to see if task type and the "Hands-Free" option had an effect on the amount of oral interaction that took place.
Spoken Turns

To answer the research question and determine whether one task led to greater amounts of spoken language than the other, I separated the number of spoken turns from the number of written turns taken by each dyad during both problems. In the breakdown of spoken turns appearing in Table 4.3, chi square tests found no significant difference in the number of spoken turns produced during either problem for the mouse-click dyads.

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Gradschool (Jigsaw)</th>
<th>Hawaii (Decision-Making)</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyad 2</td>
<td>35</td>
<td>47</td>
<td>1.756</td>
</tr>
<tr>
<td>Dyad 3</td>
<td>65</td>
<td>83</td>
<td>2.189</td>
</tr>
<tr>
<td>Dyad 4</td>
<td>68</td>
<td>53</td>
<td>1.256</td>
</tr>
</tbody>
</table>

Note. \( df=1, p<.0029 \)

However, in Table 4.4, the chi square test used on Dyad 1’s spoken turns found statistical significance. Once again, more than twice as many spoken turns occurred during the decision-making task than during the jigsaw task. Given the results of the first chi square test on total turns produced and the fact that the vast majority of total turns were spoken, not written, this result is not surprising. Comparing the 218 turns produced during Problem Hawaii with the turns produced by the mouse click dyads reveals that Dyad 1 produced two to four times as many spoken turns. Clearly, during Problem Hawaii, the “Hands-Free” option allowed Dyad 1 far more oral interaction than the mouse-click dyads could experience. Interestingly, however, in spite of the “Hands-
Free" option, Dyad 1 produced only 90 spoken turns during Problem Gradschool, less than half the number produced during the decision-making task. Because Dyad 1 used the “Hands-Free” option during both tasks, technological factors cannot be used to explain this discrepancy. It is possible that the differences in the tasks themselves must account for the differences in amounts of spoken turns.

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Gradschool</th>
<th>Hawaii</th>
<th>χ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyad 1</td>
<td>90</td>
<td>218</td>
<td>26.597</td>
</tr>
</tbody>
</table>

Table 4.4 Spoken Turns for Dyads 1

Note. df=1, p<.0029

**Written Turns**

In order to get a better idea of which task might foster more oral communication, I also wanted to investigate whether one task forced the dyads to rely more on written turns. Presumably, a consistent and considerable difference in the amount of written turns across the dyads between the two different problems could indicate that one problem was either too challenging for the dyads to complete orally or was of such a nature that written communication facilitated task completion more than oral communication.

An example of how one task could be too challenging for participants to complete orally could be seen in Dyad 4’s attempt to share information during Problem Gradschool. After an initial confusing start, Escort, the American, realized that his partner’s English might not be up to the lengthy oral explanation of the question he had
been given. As a result, he negotiated with Hajime to take turns writing out their five questions and then supplying their respective answers orally.

Escort: So would you rather that I type it out or would you rather that I speak it out to you, my answers.
Hajime: Ah, I don't know which is better.
Escort: How about we do both. Is that okay?
Hajime: Yes.
Escort: Okay, I'll go ahead and tell you the questions. I'll write out the questions for you and tell them to you so that we can both determine, ah and so you can understand what I'm trying to tell you because I understand that this connection is a little fuzzy, but. Okay?
Hajime: Okay.
Escort: Okay, I'm going to type out the first question now. *Harry would really like to begin graduate school as soon as possible. Can he apply to be admitted in January?*

Escort’s final written turn in the excerpt above was produced verbatim from the first of five questions he was asked to investigate. Both he and Hajime continued in this vein, typing out their exact questions and then discussing their answers orally. Perhaps had the answers to each of the questions been more complicated as well, this dyad might have also relied on typing out their answers instead of discussing them. Nevertheless, this dyad did make use of spoken communication for most of their turns.

A second task feature which was observed to induce written communication was seen repeatedly across all dyads when completing Problem Hawaii. As had been indicated by several of the non-native English speaking participants, discussing money and numbers while doing problem Hawaii was difficult and required that they write down exact dollar amounts. Because of the nature of setting up a budget, participants made use of the text-chat features of Yahoo! Messenger to make sure that they could keep track of how much money was being spent doing what. In fact, in some cases participants typed
line after line of the activities they had investigated and their accompanying costs in order to bring their partners up to speed on what they had found. Only after this information had been typed up on the screen did the partners begin to discuss anything. Dyad 4 takes this approach in the excerpt below.

Escort: Alright, here I go.
Hotel: Ala Moana Hotel
   It costs $95 per night per person
Hajime: Air fare is 991.74 a person
Escort: Delta Airlines from Atlanta to Honolulu is 906.00
Hajime: Hotel, waikiki beach the cheapest hotel is $79.95
   TWA from Des Moines to Honolulu is $991.74
Escort: For Dining: Ono Hawaiian Food $40 for 2 people

Table 4.5 illustrates the total written turns taken by the mouse-click dyads during each problem. Once again, chi square tests found no statistical significance in the number of written turns taken with respect to task.

| Dyad   | Gradschool (Jigsaw) | Hawaii (Decision-Making) | $\chi^2$
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyad 2</td>
<td>61</td>
<td>46</td>
<td>2.103</td>
</tr>
<tr>
<td>Dyad 3</td>
<td>19</td>
<td>15</td>
<td>0.941</td>
</tr>
<tr>
<td>Dyad 4</td>
<td>10</td>
<td>21</td>
<td>3.903</td>
</tr>
</tbody>
</table>

Note. $df=1$, $p<0.029$

Table 4.6 also shows that a chi square test found no statistical significance in the number of written turns produced by Dyad 1 either. Compared to Tables 4.3 and 4.4 above, participants took far fewer written turns than spoken turns, with the marked exception of Dyad 2. It would also appear that the “Hands-Free” option did not make
much difference in the number of written turns participant were able to produce. Based on this analysis of all four dyads, it would appear that neither task required written communication at the expense of oral communication.

Table 4.6 Written Turns for Dyads 1

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Gradschool (Jigsaw)</th>
<th>Hawaii (Decision-Making)</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyad 1</td>
<td>29</td>
<td>43</td>
<td>2.778</td>
</tr>
</tbody>
</table>

Note. $df=1$, $p<.0029$

What the Numbers Indicate

The only data found statistically significant with respect to turns found that Dyad 1 took more total and spoken turns while completing the decision-making task than during the jigsaw task. Although the statistical data from this small study did uncover a significant difference in the number of total and spoken turns produced by one of the dyads, it did not indicate that either task limited interaction. In all four dyads, participants made use of both forms of communication available to them, with spoken interaction being used the majority of the time. Both tasks did induce interaction between all participants in all dyads, and both tasks seemed to facilitate opportunities for input and output on the part of all participants regardless of whether they used the "Hands-Free" or mouse-click option.

Although the advantage of using a "Hands-Free" option to facilitate a larger number of turns needs further investigation, in the section following the analysis of the
data concerning negotiation of meaning, I will look at two other factors, task difficulty and task content, which may have had an even greater bearing on participant interaction.

**Amount of Negotiation of Meaning**

My second research question asked whether the amount of negotiation of meaning produced during a jigsaw task would be greater than that produced during a decision-making task, as prior SLA research had predicted. To remain consistent with the preceding section, I have again used turns to count the amount of negotiation of meaning that took place.

**The Differences in Negotiation of Meaning with Respect to Task Type**

Table 4.7 below illustrates the total number of turns each of the three mouse-click dyads dedicated to the negotiation of meaning during each task. A look at the raw number of turns shows a visible difference with respect to Dyad 4, which produced more than twice as many turns dedicated to the negotiation of meaning during the jigsaw task than during the decision-making task. Although no statistical significance was found between task type for these three dyads, the results of the chi square test used on Dyad 4 neared significance and would have attained significance when $p<.0046$.

In accordance with the high number of total turns produced by Dyad 1 during Problem Hawaii, as discussed previously, Dyad 1 again far outnegotiated all other dyads. A chi square test once again found statistical significance, demonstrating that far more negotiation of meaning took place during the decision-making task than during the jigsaw task.
The Differences in Negotiation of Meaning with Respect to Task Order

When setting up this study, it occurred to me that order of task completion might also have some sort of influence on the amount of negotiation of meaning that took place. It is possible that the more familiar participants became with one another’s accents, styles of expression, or typing ability, the lesser the need for negotiation of meaning due to misunderstandings.

To see whether there was in fact a significant decrease in the number of turns dedicated to negotiation of meaning from the first task to the second task, I looked at the turns produced by the NS/NNS dyads. Dyad 1’s extremely high number of total turns and turns dedicated to the negotiation of meaning during Problem Hawaii made a statistical analysis of NNS/NNS dyads unnecessary. It is clear that the negotiation that
occurred during Dyad 1’s first task, Problem Hawaii, would show that more negotiation of meaning took place during the first task among NNS/NNS dyads. However, using an additional chi square test on the combined turns produced by the NS/NNS dyads, Dyads 3 and 4, during their first and second tasks, I did find statistical significance in the different number of negotiation of meaning turns. NS/NNS dyads negotiated more often during whichever task they completed first. Table 4.9 shows a breakdown of the turns each dyad produced on the tasks they completed first or second as well as the results of the chi square test run on these figures.

<table>
<thead>
<tr>
<th>Dyads</th>
<th>Task 1</th>
<th>Task 2</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyad 3</td>
<td>16</td>
<td>10</td>
<td>11.834</td>
</tr>
<tr>
<td>Dyad 4</td>
<td>32</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

Note. \( df=1, \ p<.0029 \)

As I had suspected, information from the follow-up interviews seemed to indicate that familiarity did decrease misunderstanding. In fact, feedback from the NS participants in Dyads 3 and 4 during the follow-up interviews led me to believe less negotiation of meaning occurred during the second session for these two dyads because the native speaker participants, now more familiar with their partners’ English abilities, relied on written turns to prevent misunderstandings from occurring at all.

During their respective follow-up interviews, both members of Dyad 4 attested to the fact that either familiarity or more practice with each other led to less need for
negotiation of meaning. Hajime admitted to being nervous the first time he spoke with his partner because he didn’t know who he was talking to. However, by the second task, he felt more comfortable talking with him and working out their solution. Escort also indicated that greater rapport with Hajime led to a more comfortable and comprehensible second task. He initially found it disconcerting not to know the face or the personality of the person he was speaking with.

Interestingly, outside of their sessions, Hajime and Escort went out of their way to build rapport. Just prior to their second task, they text-chatted online for 20 minutes, getting to know each other on a more personal level. Both participants credited greater familiarity with an easier second problem.

In sum, it would appear that the results of this study do not support prior research which predicted that the jigsaw task would foster greater amounts of negotiation of meaning than a decision-making task. In fact, the decision-making task, Problem Hawaii, proved more successful for one dyad, while no significant difference in task type could be discerned among the other three dyads. However, analysis of the amount of negotiation of meaning which occurred during the NS/NNS’s sessions and post-task feedback from participants, indicated that the more familiar the dyads became with one another, the more comfortable they felt talking with each other and the less they needed to negotiate for meaning.

The Effects of Dyad Type on Interaction and Negotiation of Meaning

The third research question this study attempts to address asks whether dyad type affects the amount of interaction and negotiation of meaning which occurred. In other
words, did L2 learners benefit from more interaction or more negotiation of meaning when paired with another learner or with a native speaker. Unfortunately, unplanned technological issues made it difficult to compare the turns produced by the NNS/NNS dyads with those produced by the NS/NNS dyads. First, the “Hands-Free” option used by Dyad 1, which facilitated more spoken turns, made a comparison of turns with the other dyads unreliable. Second, the feedback problems experienced by Dyad 2 which forced participants to rely more on text-chat for a greater percentage of turns than any other dyads also meant that a comparison of these turns would be unreliable. Both technical issues also made a comparison of turns dedicated to the negotiation of meaning inadvisable as well.

However, an analysis of the strategies used by participants in the NS/NNS dyads to avoid miscommunication does serve to offer insight into the effects working with a native speaker may have on opportunities for negotiation of meaning. As stated earlier, there was a significant reduction in the amount of negotiation of meaning which occurred in NS/NNS dyads during their second task. As Hajime and Escort had indicated in their follow-up interviews, greater familiarity led to a greater comfort level. However, it also appeared that by the second task, the NS participants were more familiar with the English ability of their NNS partners and found ways to ensure that fewer misunderstandings occurred. By the second task, Escort from Dyad 3 realized that typing things with Hajime was a faster and more effective way to communicate with him. Escort’s strategy leads in to what I believe is one of the key reasons the NS/NNS dyads required less negotiation of meaning during their second tasks; they prevented misunderstandings from occurring by relying on text-chat to reinforce or avoid voice-chat.
Below is a key example of textual reinforcement that was produced by Mogador, the American participant in Dyad 3. Gifted with quick fingers, he was able to type and send messages which nicely paraphrased what he and his partner discussed as soon almost as soon as they had finished speaking.

Ingan: Okay. What about other questions?  
Mogador: Well, Harry wasn’t sure if he needed a computer science degree.  
*Computer Science Degree?*  
Ingan: I don’t know, but I saw some catalog of both of school. They don’t need to computer science degree.  
Mogador: *Stanford and MIT do not require.* Right, neither school requires one. Um, and finally, Lisa is his wife.  
Ingan: I don’t understand your question.  
Mogador: *Lisa, Harry’s wife:* Lisa wants to study linguistics.  
Ingan: Okay.  
Mogador: *Lisa wants to study Linguistics.*

The excerpt from Dyad 3’s second session illustrates how Mogador managed to keep a running tab of the bits of information he provided Ingan orally. Later in the session, when Ingan provided the answers to his five questions, Mogador continued this running list of key points. In fact, all 19 written turns from Dyad 3’s Gradschool session were produced by Mogador. When asked why he relied on text-chat, Mogador reasoned, “I used text-chat much more than my partner, and I used it to list things we were agreeing on or negotiating. The effort was to keep some things in visual memory and to allow for resolving errors.” Although both Mogador and Ingan used text-chat during Problem Hawaii to negotiate their budget, Mogador’s use of textual reinforcement seemed to be instrumental in helping Dyad 3 thwart misunderstandings, thereby reducing the need for negotiation of meaning.
Dyad 4 also made good use of written lists to help smooth communication. During their first session, it took both participants several minutes to come to the conclusion that typing their questions would be the best way to begin sharing information. However, by Problem Hawaii, their second task, they had come to the decision to textually transmit all their information before beginning discussion. Escort suggests this use of text-chat in his fourth turn.

Escort: Okay. Um, I guess what I could do is I could type out a list of the things that I have already come up with and send it to you. And I guess we could agree on something. And then you could do the same back for me. So type out what you’ve done and I’ll post it on here, and then we’ll go through it if we think that something is just too expensive or whatnot we can mark it out, okay?

Hajime: Okay.

Escort: I’m just going to start typing away, and it’ll probably take me about 5 to 10 minutes to type this out. But, how good are you with typing?

Hajime: Yeah, I will type. I think it takes 5, 5 minutes.

Escort: Okay, that’ll work. Um, let’s go ahead and start typing it out you know, and when you get things, when you get like a section of like, you know, maybe your lodging or whatever or you know, an event, then just go ahead and post it on there, and then we can look at the prices as we go, as we’re typing, typing them in. Okay?

By arranging that they will approach the solution to the task by typing up their information and dollar amounts, Hajime and Escort avoided the possible misunderstandings that discussions about money could have incurred. By using text-chat as a strategy to avoid these misunderstandings, both NS/NNS two dyads also managed to avoid some of the need for negotiation of meaning during their second task. No similar strategy of relying more heavily on text-chat to prevent misunderstandings from occurring was found in the NNS/NNS dyads. As a result, it would appear that learners in NS/NNS dyads who are familiar with their partners may not benefit from as many
opportunities to negotiate meaning as learners in NNS/NNS dyads because their native speaking partners may employ the strategy of using text-chat to avoid misunderstandings.

**Task Completion**

In this section, as I attempt to address my fourth research question which asks whether online collaborative tasks can be successfully completed by student dyads, I will investigate degrees of task completion as well as the perceptions of task difficulty held by the different participants. Although I initially envisioned that task completion would be simple to determine, observation of the task trials and feedback from the post-trial interviews forced me to modify how I evaluated task completion. In the following subsection on degrees of task completion, I will discuss the inability of one dyad to attempt a solution and another dyad’s incorrect answer.

The second subsection will look at perceptions of task difficulty. As mentioned in an earlier section, task difficulty seems to have been another factor which impacted both the amount of participant interaction and the amount of negotiation of meaning which took place. My own observation during the task trials and the feedback I received from the participants during their post-task interviews helped shed some light on the level of difficulty attributed to performing each task.

**Degrees of Task Completion**

Table 4.10 below illustrates the success or failure of all dyads in completing each task and in arriving at an acceptable or correct solution. All four dyads were able to complete the decision-making task, Problem Hawaii, in the allotted time. However, the dyads had mixed results with respect to the jigsaw task, Problem Gradschool. Only three
of the four dyads arrived at a solution before time was called, and one of those three dyads reached an incorrect solution. Nevertheless, although Table 4.10 illustrates degrees of task completion, it cannot fully explain what impeded or facilitated task completion or led one dyad to arrive at the wrong solution.

**Table 4.10 Degrees of Task Completion**

<table>
<thead>
<tr>
<th></th>
<th>Problem Gradschool</th>
<th>Problem Hawaii</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dyad 1</strong></td>
<td>Incomplete</td>
<td>Complete</td>
</tr>
<tr>
<td><strong>Dyad 2</strong></td>
<td>Complete</td>
<td>Complete</td>
</tr>
<tr>
<td><strong>Dyad 3</strong></td>
<td>Complete</td>
<td>Complete</td>
</tr>
<tr>
<td><strong>Dyad 4</strong></td>
<td>Complete – Incorrect Answer</td>
<td>Complete</td>
</tr>
</tbody>
</table>

Follow-up interviews with the participants pinpointed several features of the jigsaw task that either inspired guessing or hindered discussion. Although Problem Gradschool ideally required that both participants share their five respective pieces of information in order to arrive at the correct solution, the nature of the answer actually facilitated guessing. The either/or type of solution required for this problem, either MIT or Stanford, meant that dyads could conceivably complete the task without sharing all the necessary information. In fact, this is exactly what Dyad 2 did. One of the participants, Callis, admitted to only being able to locate 4 of the 5 answers. Similarly, his partner BB had trouble finding corresponding pieces of information at both universities’ websites. As a result, they arrived at their decision based on only partially complete information yet
managed to solve the task correctly. The either/or nature of the answer gave them a 50% chance of arriving at the correct solution even without exchanging information.

Interestingly enough, in spite of this loophole, Dyad 1 was too confused or overwhelmed by the information they had to read through at both universities' websites to even hazard a guess, failing to even complete the task, much less arrive at the correct answer.

However, the degree of task completion for Problem Gradschool was also influenced by a task feature specific to jigsaw tasks. Recall that one of the features of a jigsaw task is a single correct answer while a decision-making task can have multiple possible outcomes. These multiple outcomes allow for more flexibility and more leniency when minor errors or miscalculations are made during a decision-making task, while the single acceptable answer for a jigsaw task is less forgiving of student error.

One minor error made by Hajime, the Japanese participant in Dyad 4, was instrumental in why they arrived at the wrong answer. What appeared to be either a reading misunderstanding or a mix-up over which of the two universities required a GRE score for admission contributed to Dyad 4’s incorrect conclusion.

Conversely, the wide range of possible answers for Problem Hawaii meant that errors or unshared information did not prevent task completion. It also meant that participants had more flexibility to omit erroneous information so that they could still arrive at an acceptable answer. This exact situation occurred in Dyad 1 when the Korean participant, Kelly, the high culture traveler, looked up sports and adventure activities.

Kelly: Um, I just. I thought, it’s my mistake. I thought I am the adventure trip person, so I just checked some prices of, of snorkeling.
As she and her partner worked to complete Problem Hawaii, Kelly was able to remedy her mistake. After determining that they both had $1000 a piece to spend on their respective activities, Kelly came up with a solution to her earlier mistake. Instead of reporting all the sports and adventure activities she investigated, she decided on a new high culture activity that she could accomplish with the remaining $1000.

Kelly: I will use money for limousine trip.

Perceived Degrees of Difficulty

Another factor, which affected the outcomes of these tasks, was perceived degrees of difficulty. Following the task trials, all participants were asked which task they found more difficult to complete. In accordance with what I was able to observe during the recording of the trials, the feedback I received indicated that participants who had trouble with the directions or data collection for one of the problems also had difficulty completing the task. Yama, the Japanese participant from Dyad 1 admitted that he did not understand the specific directions for Problem Gradschool and that the purpose of this task was not clear. Yama’s confusion is evidenced by his need to confer with the research during Problem Gradschool in order to seek clarification on task directions.

Yama: What are we supposed to do? I just write down what she found on the website?
Researcher: Okay, you each have...
Yama: We just exchange information with each other?
Researcher: Yeah, you, you need to exchange information.
Yama: Cause we have, because I have, I have five questions, five answers, and Kelly also got a different five answers, right?

With respect to Dyad 4, which did complete Problem Gradschool yet arrived at the incorrect answer, the Japanese participant, Hajime, also claimed that chatting was
difficult because he didn’t really understand the directions. In addition, he also found the homework to be a challenge. He admitted that reading through the universities’ webpages was time consuming and a little overwhelming. The overwhelming amount of information he had to read through potentially contributed to Dyad 4’s incorrect solution.

The Students’ Perspective on Online Oral CMC

The fifth and final research question this study addressed was whether L2 students felt online oral CMC tasks actually benefited their oral language production and reception. In general, participants were pleased with the prospect of oral CMC, yet had much to say about the specific content or difficulty of each task and how these factors limited or enhanced their opportunities for discussion. In general, factors such as task difficulty, authenticity and usefulness of task topic, the type of answer expected, as well as dyad type received the most comments.

The Effect of Task Difficulty on Participation

One aspect of task difficulty that received both positive and negative comments from participants dealt with the homework required before each online meeting. With the exception of the members of Dyad 3, most participants found combing through all the English information on Stanford’s and MIT’s various webpages far more difficult than surfing the Internet for information about Hawaii. Dyad 1’s Yama found it impossible to read through so much information in just an hour to locate the answers to his five questions. As a result of not being able to find all the answers, his ability to complete the task and the amount of speaking he did during Problem Gradschool was severely
hindered. Similarly, Callis from Dyad 2 was also unable to locate the answers to all five of his questions, so there was less information for him to discuss with his partner.

On the other hand, the same participants who had trouble doing the homework for Problem Gradschool found the homework for Problem Hawaii far more feasible. Yama claimed that being able to do a keyword search for information about Hawaii meant that he could actually find a lot more information in one hour to discuss with his partner. BB, from Dyad 2, went a step further in simplifying his information gathering because he actually searched for information using Japanese, not English. He too was able to locate and process a lot of information in a shorter time to share with his partner. In contrast, when doing Problem Gradschool, BB claimed it took him a full two hours of reading through so much information in English before he could find the answers to all five of his questions.

The Effect of Task Content on Participation

The content and authenticity of the tasks were also singled out as task features that made one task better than the other for improving English and offering more opportunities for speaking. Both members of Dyad 3 felt that the yes/no nature of the questions they were given and the either/or nature of the correct answer to the problem really didn’t leave them much to talk about. They believed Problem Gradschool would have led to more speaking and been better for improving English if it contained a more complex puzzle. Ingan felt that reaching a final answer for Problem Hawaii actually required discussion, while Problem Gradschool’s need for discussion was more limited. In fact, he insisted that the physical distance of performing the task through voice-chat was what led to any discussion on the part of this task; had he and his partner been
sharing a table in a face to face discussion, they could have simply shown each other their respective answers and avoided speaking altogether. In addition, Mogador, an American, commented on the authenticity of Problem Hawaii because his assignment was very similar to what he would have done had he actually been planning a trip to Hawaii. This authenticity made Hawaii seem more interesting which also led to more interaction on his part.

A more authentic or specific task or topic meant that some of the other participants actually found Problem Gradschool better for improving their English. Both Callis and BB from Dyad 2 agreed that Problem Gradschool was better for improving their English because the specificity of the questions meant they had to be more careful in their explanations. For BB, it also meant that he had to do his homework in English, not Japanese. Furthermore, both agreed that the topic of the problem was key. Although neither BB nor Callis had plans to visit Hawaii in the near future, both were students in the Computer Science department, so reading about similar departments at two other American universities had some sort of relevance in their lives. While neither of them had begun thinking about attending graduate school yet, they did find it interesting to learn about requirements for these two graduate programs, should they consider graduate school in the future.

The content of the task and the impact on the type of language it required students to produce meant that Problem Hawaii was viewed by some as less conducive to speaking. Both Hajime and Escort from Dyad 4 felt that the need for numerical calculation meant that more had to be typed than in Problem Gradschool. BB from Dyad 2 also felt that it was necessary to do more typing during Problem Hawaii because it was
difficult for him to understand money amounts when they were spoken; he needed the visual reinforcement.

Problem Hawaii also came under criticism as not being as useful for learning English as Problem Gradschool because of the number amounts involved. Surprisingly, in spite of the amount of speaking that took place between the members of Dyad 1 when doing Problem Hawaii, Yama, in particular, felt that the numerical aspect of figuring out a budget was not as conducive to language learning. Yama's opinion was probably influenced by the fact that a great deal of the misunderstanding that occurred between him and his partner was caused by the use of vague mathematical equations and faulty addition caused by typing errors.

The following example illustrates how Kelly's tendency to type numbers on the screen without providing Yama with an explanation of what they meant sometimes left Yama a little confused.

Kelly: $1200 + 700 = 1970$
Yama: 84 bucks for days and 4 days 420 bucks per person
If we, if we use ah, separate, we use two room we can, we can use 1970. We'll get a $3000. What is, what is 1200 cost?
Kelly: Uh, it is price of ticket, airplane ticket. One, twelve...
Yama: What? Yeah, yeah, okay.

Although it appears that Kelly and Yama have resolved this initial misunderstanding, Yama realizes something isn't quite right when he reflects on an earlier part of their discussion about plane ticket prices. Both he and Kelly finally realize that Kelly has made a typing error, leading to a budget miscalculation.

Yama: Just a second, one, what was the 1200 for?
Kelly: Ticket. Airplane ticket.
Yama: Air ticket?
Kelly: Yeah.
Yama: But just, ah, you told me that the air ticket is one thousand
Kelly: Ah, ah!
Yama: Ninehundred...
Kelly: That’s my mistake, my mistake. I’m sorry. It’s about
Yama: You miss it?
Kelly: Yeah, ah. Wait, it’s about, ah
Yama: Air ticket is not one thousand ninehundred?
Yama: How much for air ticket?
Kelly: 1920+770=2690

Of course, this provided wonderful opportunities for negotiation of meaning,
which forced Kelly to clarify what she had typed until Yama could follow her thinking
and continue with the budgeting. From Yama’s perspective, however, these numerical
and mathematical misunderstandings didn’t strike him as particularly helpful for learning
English. It would appear that he judged the usefulness of each task on the lack of
misunderstanding that occurred between participants and not on the amount of interaction
that took place.

Another example which points to task content as a major factor in determining the
effectiveness of either task in fostering oral interaction and the negotiation of meaning
was introduced by Ingan in his follow-up interview. Through an oversight of my own, I
did not realize the extent to which he was already familiar with the Computer Science
graduate programs at MIT and Stanford. Because he feels many of the computer science
courses being offered to undergraduates at Iowa State University are not challenging
enough, Ingan had begun looking to at different graduate programs to apply to. He
alludes to his background knowledge on requirements for admission to these programs
during the task trial.
Ingan: I don’t know, but I saw some catalog at both of school. They don’t need to computer science degree.

Due to familiarity with the procedure of looking at graduate schools and his particular knowledge of the two universities in question, it is no wonder that Ingan began Problem Gradschool with so much confidence.

Ingan: Hi Mogador, we don’t need ten minutes this problem.

As stated earlier, Ingan and Mogador finished Problem Gradschool in just over 11 minutes. For someone so familiar with the information under discussion, it is no wonder that Ingan didn’t think that Problem Gradschool required as much discussion.

The Effect of a Partner’s L1 on Learning Potential

A final factor which the non-native English speaking participants commented on was their partner’s native language (L1). Both non-native English speaking participants from Dyads 3 and 4 expressed the firm belief that carrying out these tasks with a native English speaker was more beneficial for their English than if they had talked with another non-native English speaker. Ingan believed that had he talked with a non-native English speaker who’s English ability was the same as his, they wouldn’t have been able to understand each other or complete their task in the allotted 20 minutes. Hajime’s reasoning was quite different from Ingan’s, although he reached the same conclusion. He felt it was better to do these tasks with an American because the content of the tasks was something that an American would be more familiar with. In his opinion, task content, not English ability was what made an American partner more desirable.

With respect to the NNS dyads, Callis was of the opinion that working with a native English speaker would have been better for his English. He reasoned that
Japanese and Koreans are similar with respect to learning style and the types of mistakes they make in English. As a result, even though they have different native languages, their language backgrounds and abilities are too similar to be helpful. In fact, Dyad 2 was the only dyad with a negotiation routine that failed because the speaker did not have a good enough grasp on the meaning of a word he used to explain it to his partner.

Callis: *Also can apply for TA or RA*
BB: *Excuse me, What is RA*
Callis: *So I think harry need to apply to MIT*  
*You don’t know RA?*  
*Ask her.*

Callis admitted that he had an idea of what an RA was because he had heard the expression used on campus; however, he didn’t know that the initials stood for research assistant, so he advised BB to ask me.

Yama held the same opinion as Callis with respect to the similarities between Japanese and Koreans. However, in his opinion, working with a non-native English speaker from such a similar language background was actually better than working with an American. Although he was the only participant to feel this way, the interaction between Yama and Kelly seemed to indicate that such a match-up was probably ideal for him. In his experience in talking with native English speakers, Yama had encountered a lot more communication difficulties than in talking with other non-native speakers. He felt that cultural differences and lack of empathy in understanding someone struggling to speak English would make an American a poor partner to have. Although Yama felt adamant about this, it is still interesting to note that his task and partner preferences were
based on which would lead to fewer misunderstandings, not necessarily which would help improve his English.

In the following chapter, I will review these key findings and discuss their implications for teaching and research. In addition, I will re-evaluate the two tasks to determine how they might possibly be adapted for an actual EFL classroom and I will outline a possible framework for network oriented tasks which can be used to facilitate second language acquisition through the negotiation of meaning.
CHAPTER 5. CONCLUSION

In sum, analysis of the results of the task trials and post-task interviews revealed clear differences in the performance of the dyads in each task and the factors that influenced these differences. This study has found that both a jigsaw and a decision-making task could be performed with varying degrees of success over a voice and text based application between participants at remote sites. The use of headphones and the "Hands Free" button were found to lead to a greater number of spoken turns. Contrary to prior research, this study did not find that a jigsaw task unequivocally led to greater amounts of negotiation of meaning than a decision-making task. In fact, participant feedback seemed to indicate that perceived task difficulty, task content, the type of answer expected, and familiarity with the task had a greater impact on the need for negotiation of meaning than did the specific task features outlined by Pica et al (1993). In addition, familiarity with their fellow participants also seemed to reduce the need for negotiation of meaning, particularly with respect to the mixed NS/NNS dyads, in which the native English speakers made greater use of text-chat to avoid miscommunication the second time around.

The participants' evaluations of each task also showed that preferences were highly influenced by task content and the type of answer expected. Students with an interest in computer science programs at graduate schools found discussion easier and more productive on the jigsaw task. Others found the Problem Hawaii to be more authentic and flexible, thereby leading to more opportunities for discussion, marking it as
the better task. Furthermore, with the exception of one student focused more on the feasibility of communication and not necessarily on language learning, all NNS participants shared a preference for conducting the task with a native English speaking partner.

In the following subsections, I will reevaluate the tasks and procedure for use in an actual EFL classroom and discuss the implications these findings have for the design of similar CMC tasks and future research in both oral and text-based CMC.

Re-evaluation of Tasks and Procedure

This study was intended as an investigation of two original tasks to determine whether such tasks could be completed in an oral CMC environment and whether one or the other would facilitate greater amounts of negotiation of meaning. The fact that all four dyads were able to undertake both tasks, attempted some sort of negotiation of meaning on both tasks, and attempted to reach a solution under the time and circumstances presented them leads me to believe that these tasks do have potential for use in a language class. Nevertheless, the study did reveal task characteristics or weaknesses in the procedure that need further development or consideration before being used in an EFL class.

Although the original goal underpinning this research was to find activities for use in an EFL setting, this study could only be conducted using English as a second language (ESL) learners, not EFL students. Arguably, these participants represent something of a higher level of English student as evidenced by their TOEFL scores and the fact that they are currently studying and succeeding at an American university. As a result, the tasks
were designed with such a level in mind. The particular pieces of information students were asked to search for and the focus on a computer science graduate program in Problem Gradschool were specifically tailored to coincide with the potential needs and interests of computer science undergraduates. Furthermore, this problem was also designed so that participants were asked questions which they hopefully did not already know the answer to. Had I asked them information about applying to an undergraduate program or an intensive English program, it is possible that they might already have encountered the answers to these questions during their own application process. In fact, Dyad 3’s quick completion of Problem Gradschool illustrates how this task can fail when it is too familiar. Participants who already possess the necessary information to complete the task individually will not need to engage in much discussion.

The nature of Problem Gradschool’s solution is also problematic. The either/or nature of the answer meant that participants could arrive at the correct solution by lucky guess and without much discussion or negotiation of meaning. Without altering the content of the problem, the solution itself could be made more complex by requiring greater output on the part of the participants. Gass and Varonis’s (1985) work with both one-way and two-way tasks indicated that the type of output produced by the participants had an effect on the amount of negotiation that took place. Unlike Problem Hawaii, which required participants to email a budget to their boss, Problem Gradschool only required participants to email the name of the best university to Harry. Had Problem Gradschool’s solution taken the form of a letter to Harry that required participants to justify their selection, all dyads might have been required to do a little more maneuvering and negotiating to create an adequate solution.
Ironically, in spite of Problem Gradschool's simple solution, some dyads still struggled with it because either the task itself did not make sense to participants or there was too much reading involved for them to find the answers to all ten questions. To assist students at a lower reading level, some participants advised supplying more direct links to the specific page or part of a page that the correct answer is located on. Although links were given to these pages, they were not specifically labeled to indicate which of the five questions could be answered on which page. Perhaps such direct help to find the answers might have meant that more participants could have completed their five questions completely and accurately.

Unlike Problem Gradschool, Problem Hawaii did not suffer from problems of being overly specific, overly simple or overly complex. As a result, it is likely that Problem Hawaii would not have to receive nearly as much modification for different levels of students. Nevertheless, for lower level students who are not as familiar with search engines or locating travel information on the Internet or who require more time to read, direct links to some useful travel or Hawaiian sites might also provide such students with more to discuss and more opportunities for negotiation.

Another aspect of the procedure which would need modification to accommodate varying levels of student is the amount of time given to dyads to complete each task. Due to the amount of time it takes to transcribe such long conversations, the participants were restricted to 20 minutes. Although this seemed adequate for some groups, others seemed to rush through their allotted time in an effort to arrive at some sort of solution before time was called. Had participants been given more time, they might easily have continued talking. Unfortunately, this time constraint also seemed to inhibit the
negotiation of meaning at times because participants felt pressured to complete the task before time was up, so they disregarded what they considered to be minor misunderstandings. The fact that they could complete the tasks without overcoming these misunderstandings might indicate that the tasks themselves were not that ideal for inducting negotiation of meaning. However, an equally important drawback to this procedure was that too short a time limit possibly hindered negotiation of meaning and potential key opportunities for second language acquisition.

Evaluation of Task Features for a Network Oriented Task

In light of the re-evaluation of the tasks used in this study, it appears that there are certain task features which are better suited to a network environment and which Pica et al’s (1993) classification of communicative task features for traditional classroom tasks cannot account for. Table 5.1 identifies three features of a network oriented task (NOT) which this study uncovered as being beneficial to facilitating the negotiation of meaning.

Table 5.1 Characteristics of a NOT most likely to lead to the negotiation of meaning

<table>
<thead>
<tr>
<th>Pre-Task Preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexibility to Search Relevant Network Resources</td>
</tr>
<tr>
<td>Complex Solution</td>
</tr>
</tbody>
</table>

The first feature, pre-task preparation, relates to the “homework” that all participants were required to do prior to meeting online. This pre-task preparation gives
learners the time to gather information necessary to complete their half of the task. Adequate preparation time is also necessary to ensure that all participants can gather sufficient information and have enough time to comprehend this information before engaging in a CMC discussion. During the study, it was observed that participants who were underprepared interacted less with their partners and did not encounter as many opportunities for the negotiation of meaning.

The second task feature, flexibility to search relevant network resources, was a feature of Problem Hawaii but not Problem Gradschool. It was Problem Hawaii's freedom to search for a wider range of information which participants indicated as inspiring more opportunities for discussion and possibly more opportunities for the negotiation of meaning. Problem Hawaii's flexibility was due in part to its nature as a decision-making task, which allowed for multiple possible outcomes as opposed to the one acceptable outcome characteristic of a jigsaw task. In accordance with this study, therefore, it appears that one of the key features of a face-to-face decision-making task as outline by Pica et al (1993) is possibly more conducive than a the single outcome requirement of a jigsaw task to the negotiation of meaning during a NOT. This reasoning is outline in Figure 5.1. which illustrates how multiple possible outcomes in a decision-making NOT can lead to greater opportunities for discussion which in turn may facilitate greater opportunities for negotiation of meaning. This is in contrast to the single outcome acceptable in a jigsaw NOT, which may actually serve to limit discussion and subsequent opportunities for negotiation of meaning.

The third and final feature of a NOT likely to lead to the negotiation of meaning is a complex solution. During this study, it was observed that the either/or nature of
Problem Gradschool did not require the participants to interact as much as Problem Hawaii's budget solution did. Had Problem Gradschool's solution been more complex and taken the form of an E-mail to Harry in which participants advised him which graduate program to apply to and justified their decision, this would have required more interaction than an either/or solution and may have led to more opportunities for the negotiation of meaning.

Figure 5.1 Outcome effects of decision-making and jigsaw NOTs on the negotiation of meaning
Classroom Implementation

As indicated earlier, instructors wishing to implement similar tasks in their own EFL classroom will need to tailor them to the level and interests of their students. The exact content of each task can be altered to meet with students’ future needs. Students who have already been to Hawaii may need to be given a different tourist location to visit so that they must look up information online instead of relying on information from memory and experience. With respect to a the jigsaw task, Problem Gradschool could be tailored to meet the needs of students just planning to study abroad for a semester or even planning to enroll in an intensive English program. Instead of finding out information concerning two graduate programs in computer science, they could be directed to look at other departments or universities they actually might be interested in attending.

Once again, in order to meet the needs of lower level students, time is another factor that could be adjusted. In addition to giving students more than 20 minutes to perform the actual task with their partners, they could also be given more time or fewer questions to investigate for homework or in-class work. The feedback sessions from the task trials revealed that more time or more assistance would have helped participants with lower reading ability. A lesson could be designed around improving online search skills or developing appropriate vocabulary to assist in searching through a university website. In addition, spending class time to lookup information online under the guidance of the instructor could make be used to make sure lower level students are fully prepared to discuss the problem with their partner and that they have adequate understanding of what they read.
Suggestions for Further Research

Due to the small size and carefully selected type of participant used in this study, the results must be used with caution. It is quite likely that individual differences among participants and the linguistic and cultural similarities between the Japanese and Koreans might have had an exaggerated effect in such a limited study. Nevertheless, the results presented here indicate a potential for further research in a communication medium that is as yet underutilized in the ESL/EFL classroom.

The proceedings of this year's American Association of Applied Linguistics (AAAL) and Computer Applications in Language Instruction Consortium (CALICO) conferences showed that text-based CMC is an area rich and growing in research potential. Interestingly, research carried out in text-based CMC represents opportunities for research and comparison with oral CMC or mixed medium CMC. Fidalgo-Eick (2001) investigated and verified the validity of Varonis and Gass's (1985) model for negotiation of meaning in synchronous text-based CMC. Although my own study assumed that this model was valid for oral CMC as well, further analysis of the transcripts may serve to concretely verify this. It is also possible that future research in this area could help further refine a model for negotiation of meaning in joint text/oral CMC where turn-taking is less orderly due to the varying degrees of synchronicity oral and text-based interaction entail. Such research may also attend to the following questions. Do routines carried out via CMC take longer to resolve than those carried out in a face-to-face discussion? In mixed-medium CMC, are attempts at negotiation of meaning more likely to be resolved orally or in written form? Does either form led to greater opportunities for second language acquisition or language retention, if at all?
Along a similar vein, Lisa Jurkowitz's (2001) pilot study with learners of French asks whether text-based CMC activities help students improve grammatical accuracy by focusing on form. Results seemed to indicate that the particular forms being focused on and the students' own expectations were overriding factors which influenced improvement or lack thereof. Although my own study investigates tasks for their effectiveness in encouraging interaction and negotiation of meaning, no attempt was made to determine whether such opportunities to rely on oral CMC to complete communicative tasks actually led to improvement in language ability. Instructors planning to invest the extra time and energy in developing and using such oral CMC tasks would surely appreciate knowing whether such tasks actually helped their students. Furthermore, research on whether dyad type impacts acquisition would help teachers determine whether to link their students with other non-native speakers or with native-speakers. In addition, another significant aspect of dyad type which this study did not address is that of gender. In this study, 3 of the 4 dyads consisted of two male participants. However, the lone dyad with a female participant, Dyad 1, is the same dyad that produced the greatest number of turns and turns dedicated to the negotiation of meaning. In truth, technical factors no doubt contributed to this difference, but the question remains as to what degree the gender of the participants also influenced the amount and type of interaction that took place in addition to the amount of negotiation of meaning.

A third recent study compares the amount and type of interaction which occurs in text-based CMC and face-to-face oral discussion (Bearden, 2001). Perhaps not surprisingly, she found significantly less interaction occurred during text-based CMC. Would similar results be found in a comparison of face-to-face discussion and oral CMC,
or would something like a "Hands Free" option lead to less of a spread? Would the lack of visual cues in oral CMC actually lead to more interaction or more negotiation of meaning? Would the language used during oral CMC resemble that used during normal face-to-face conversation, or would it be even more simplified and briefer to adjust for the lack of visual cues?

A small study such as this requires a second look. Would carrying out a similar study on a different group of students lead to similar results? Japanese and Korean participants seemed to indicate that the similarities between their languages ensured greater understanding. Would NNS from more varied language and cultural backgrounds also be able to complete the tasks? Would they negotiate more or would pronunciation difficulties force students to revert to text-based communication only? With respect to technical issues, would another study verify the significance of the "Hands-Free" option in facilitating interaction?

New technology leads to newer possibilities for teachers to bring more authentic opportunities for language use into the EFL classroom. However, before turning to oral CMC as a replacement for face-to-face communication, teachers need to be aware of what to expect from this new medium. Like text-based CMC, oral CMC represents an area wide open to further research.
APPENDIX A. CONSENT FORM

The document on the following two pages is the consent form that all participants read and signed before beginning this study.
Consent Form

Consent
Thank you for your interest in participating in this study. Before beginning, it’s important that you understand what you will be asked to do, any risks involved, and any benefits you may experience as a result. It’s also important that you understand that participation in this study is completely voluntary. If at any point during the study you wish to quit, you may do so. Quitting will have no effect on your grades or classes at Iowa State University. If anything is unclear or if you have any questions at any time, please feel free to ask the researcher.

Purpose
The purpose of this study is to look at two types of pairwork activities performed online using Yahoo Messenger, a type of voice/text chat software. Some of the pairs will be combinations of native English speakers and non-native English speakers while other pairs will consist of non-native English speakers from different countries. The focus will be on determining which type of task and which combination of partners is better for teaching English. Your own language ability is not being investigated, so there is no need to be concerned about your performance. As stated, the focus of the investigation is on the tasks, not on the participants.

Procedure and Time Commitment
In addition to completing this consent form, you will be asked to do the following:
1. Complete a questionnaire on your language learning background and familiarity with computers and voice-chat software. Approximately 20 minutes.
2. Sign up for an account with Yahoo Messenger. Approximately 15 minutes.
3. Meet with the researcher online to practice using the voice/text chat software. 5-10 minutes.
4. Meet your conversation partner online to introduce yourselves and to agree upon future online meeting times. At least 10 minutes.
5. Prepare your assigned task. This will involve using the Internet to find out information to questions or to locate facts. For each task, you will need to spend a maximum of an hour completing searching for information. Maximum 2 hours.
6. Meet with your conversation partner online on two future occasions to complete collaborative language activities similar to the kind you might encounter in an English conversation class. These meetings will be videotaped. 20 minutes each time.
7. Complete an exit interview and feedback form. 30 minutes.

Risks and Benefits
Although this study is meant to be risk-free, it is possible that you may be a little nervous talking with a partner who you cannot see or do not know very well. As is the case with pairwork activities, it is also possible that you may get frustrated with your partner, especially if a misunderstanding takes place. As there will be a video camera recording the computer screen and your voice, it is also possible that you may feel a little nervous. However, I hope you will find the benefits to outweigh any inconveniences. For those of you who are interested in eventually apply to MIT or Stanford University, you may learn something useful. Hopefully, you will also enjoy the chance to voice chat with someone from another country. And for those of you who are interested in working on your English, these tasks are hoped to provide you with the chance to practice speaking.

In order to protect your privacy, please choose a pseudonym you would like to use. This is the name that you will use with your partner. In the write-up of this research, your pseudonym will be used to protect your identity. By signing below, you show that you understand what you are being asked to do, and you are giving the researcher, Shannon Sauro, permission to use the background information and the results from the upcoming trials to complete her research.
When completed, please mail this form to Shannon Sauro, 4108 Buchanan Hall, Ames, IA 50013
APPENDIX B. HUMAN SUBJECTS FORM

In accordance with Iowa State University policy, the following documentation shows that research for this study was conducted with the approval of the Human Subjects Committee.
Information for Review of Research Involving Human Subjects
Iowa State University

(Please type and use the attached instructions for completing this form)

1. Title of Project: The Success of Task Type in Facilitating Oral Language Production in Online Computer Mediated Collaborative Projects

2. I agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects are protected. I will report any adverse reactions to the committee. Additions to or changes in research procedures after the project has been approved will be submitted to the committee for review. I agree to request renewal of approval for any project continuing more than one year.

Shannon Sauro
Typed name of principal investigator

Date: 10/29/00

Department: English Department

206 Ross Hall
Campus address:

515-572-6317
Phone number to report results

3. Signatures of other investigators

Date

Relationship to principal investigator

4. Principal investigator(s) (check all that apply)

☐ Faculty
☐ Staff
☒ Graduate student
☐ Undergraduate student

5. Project (check all that apply)

☐ Research
☒ Thesis or dissertation
☐ Class project
☐ Independent Study (490, 590, Honors project)

6. Number of subjects (complete all that apply)

# adults, non-students: 2 # minors under 14: # minors 14 - 17:

# ISU students: 6 or 8 other (explain):

7. Brief description of proposed research involving human subjects: (See instructions, item 7. Use an additional page if needed.)

The purpose of this investigation is to see whether the type of English language task (jigsaw or problem-solving) completed by pairs of students voicechatting online affects negotiation of meaning and the amount of total language used. Different types of pairs, native English speaker/non-native English speaker pairs and mixed non-native English speaker pairs, will be used to see how participants affect negotiation of meaning and overall participation. Data will be collected using both pre and post-task questionnaires. In addition, the chatting sessions will be video recorded to what is said and written by participants. Transcripts of each chat session will be transcribed and analysed.

Because this study is meant to investigate possible teaching material to be used in Korean and Japanese classroom, the non-native English speaking subjects will be Korean and Japanese. Students with a strong background in computers are also being selected so that they will be able to work in a technical environment without requiring additional training from the researcher. As a result of these qualifications and because the researcher knows of far more male Korean and Japanese students who fulfill these requirements, it is expected that most if not all participants will be male. The two native English speaking participants will be selected from a remote location, Atlanta, Georgia, to test out the effectiveness of voicechatting over a long distance. Furthermore, these two participants will also be chosen based on their computer familiarity and interest in speaking with non-native English speakers.

(Please do not send research, thesis, or dissertation proposals.)

http://www.grad-college.iastate.edu/forms/HumanSubjects.doc
9. Confidentiality of Data: Describe below the methods you will use to ensure the confidentiality of data obtained. (See instructions, item 9.)

All participants will be given a pseudonym which they will use throughout the study. Although data will be collected using a video-camera, only the voices of the participants will be recorded.

10. What risks or discomfort will be part of the study? Will subjects in the research be placed at risk or incur discomfort?

Describe any risks to the subjects and precautions that will be taken to minimize them. (The concept of risk goes beyond physical risk and includes risks to subjects’ dignity and self-respect as well as psychological or emotional risk. See instructions, item 10.)

The only risks involved might be the discomfort one feels when talking with a stranger for the first time, particularly when that stranger’s face is not visible. In addition, it is possible that participants may become frustrated during the completion of the tasks as a result of misunderstandings or disagreements with their partners.

11. CHECK ALL of the following that apply to your research:

- [ ] A. Medical clearance necessary before subjects can participate
- [ ] B. Administration of substances (foods, drugs, etc.) to subjects
- [ ] C. Physical exercise or conditioning for subjects
- [ ] D. Samples (blood, tissue, etc.) from subjects
- [ ] E. Administration of infectious agents or recombinant DNA
- [ ] F. Deception of subjects
- [ ] G. Subjects under 14 years of age and/or
- [ ] H. Subjects in institutions (nursing homes, prisons, etc.)
- [ ] I. Research must be approved by another institution or agency (Attach letters of approval)

If you checked any of the items in 11, please complete the following in the space below (include any attachments):

Items A–E Describe the procedures and note the proposed safety precautions.

Items D–E The principal investigator should send a copy of this form to Environmental Health and Safety, 118 Agronomy Lab for review.

Item F Describe how subjects will be deceived; justify the deception; indicate the debriefing procedure, including the timing and information to be presented to subjects.

Item G For subjects under the age of 14, indicate how informed consent will be obtained from parents or legally authorized representatives as well as from subjects.

Items H–I Specify the agency or institution that must approve the project. If subjects in any outside agency or institution are involved, approval must be obtained prior to beginning the research, and the letter of approval should be filed.
Checklist for Attachments and Time Schedule

The following are attached (please check):

12. ☒ Letter or written statement to subjects indicating clearly:
   a) the purpose of the research
   b) the use of any identifier codes (names, #’s), how they will be used, and when they will be removed (see item 17)
   c) an estimate of time needed for participation in the research
   d) if applicable, the location of the research activity
   e) how you will ensure confidentiality
   f) in a longitudinal study, when and how you will contact subjects later
   g) that participation is voluntary; nonparticipation will not affect evaluations of the subject

13. ☒ Signed consent form (if applicable)

14. ☐ Letter of approval for research from cooperating organizations or institutions (if applicable)

15. ☐ Data-gathering instruments

16. Anticipated dates for contact with subjects:

   First contact
   11/5/00
   Month/Day/Year

   Last contact
   12/15/00
   Month/Day/Year

17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:

   05/15/01
   Month/Day/Year

18. Signature of Departmental Executive Officer

   Date 10/30/00

   Department or Administrative Unit

19. Decision of the University Human Subjects Review Committee:

   ☒ Project approved
   ☐ Project not approved
   ☐ No action required

Name of Human Subjects in Research Committee Chair

Patricia M. Keith

Date 11-2-00

Signature of Committee Chair
APPENDIX C. THE JIGSAW TASK

This appendix contains the directions to the jigsaw task, Problem Gradschool. It includes the general directions for both participants as well as the two separate sets of questions for each partner.
Problem Grad School

Background Information

You and your partner have a friend from China, Harry Liu, who has been thinking about coming to the United States to get a Master's degree in computer science. It's his dream to study at either Stanford or MIT, but he is so pessimistic about his chances of being accepted or being able to afford to attend school in the United States that he has never bothered to investigate his chances.

In order to give him encouragement, you and your partner have decided to investigate the Stanford and MIT websites for him to see which school, if any, he might be able to attend. Although you're both friends with Harry, you know different things about his academic background, financial situation and research interests. As a result, you will each find different pieces of information about each school to share with each other when you meet online.

Pre-Task
Before you meet, will need to visit the MIT and Stanford University websites. Please do not spend more than an hour looking up the answers to the questions.

If you are Partner 1, click here.

If you are Partner 2, click here.

Task
After investigating the Stanford and MIT websites, you and your partner will have 20 minutes to chat online to share what you know about Harry and information about each school. By sharing your information, you will need to decide which of the two schools is the best one for Harry to apply to. To do this, you will need to find which of the two schools fulfils most of his needs.
Problem Grad School - Partner 1

Before meeting with your partner online, you will need to go to the MIT and Stanford University websites to find the answers to these questions. Below are a list of links to the pages at both Stanford and MIT that should help you find the answers to your questions.

Please do not spend more than 1 hour looking up the answers.

Some useful links at Stanford:

- Department Admission Requirements
- Application Guidelines to the Computer Science Department
- Master's of Science in Computer Science FAQ
- Master's Program Degree Information

Some useful links at MIT:

- Graduate Admissions
- Admission Frequently Asked Questions
- Electrical Engineering and Computer Science Graduate Program

Use the information you find to fill out the chart below to help you see which school is better for Harry. You'll need to share this information with your partner when you chat online.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Stanford</th>
<th>MIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Harry took the GRE last year, but his scores were not very high. Does he need his GRE scores to apply?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Is there a minimum GRE score?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. His most recent TOEFL score is 590, but he is currently awaiting the results of the TOEFL he took last month and feels confident that he did even better on this last test. Is a TOEFL score required for either school.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Does he need to take the TSE, Test of Spoken English.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Harry has some money saved in his bank account but not enough to pay completely for graduate school. As a result, he must be able to receive some sort of</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
financial aid or assistantship to go to school. Does either MIT or Stanford guarantee an RA or TA position for graduate students pursuing Masters degrees?

Back to Problem Grad School.
Problem Grad School - Partner 2

Before meeting with your partner online, you will need to go to the MIT and Stanford University websites to find the answers to these questions. Below are a list of links to the pages at both Stanford and MIT that should help you find the answers to your questions.

Please do not spend more than 1 hour looking up the answers.

Some useful links at Stanford:

- Department Admission Requirements
- Application Guidelines to the Computer Science Department
- Master's of Science in Computer Science FAQ

Some useful links at MIT:

- Graduate Admissions
- Admission Frequently Asked Questions
- Electrical Engineering and Computer Science Graduate Program

Use the information you find to fill out the chart below to help you see which school is better for Harry. You'll need to share this information with your partner when you chat online.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Stanford</th>
<th>MIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Harry would really like to begin graduate school as soon as possible. Can he apply to be admitted in January?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. What is the application deadline for the next fall semester? If it will take Harry about two weeks to get his application materials together, do you think he'll have enough time to apply?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Harry is not planning to study for a Ph.D., and he's not interested in working in academia. As a result, he would prefer attending a graduate program where he is not required to write a thesis. Does either MIT or Stanford allow for a non-thesis option?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Unfortunately, Harry does not have an undergraduate degree in computer science. However, he did take a number of courses in mathematics and a few in</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
computer science. Is his academic background appropriate for studying at either school?

5. Harry's wife Lisa is also interested in getting a graduate degree in Linguistics. Do either MIT or Stanford have graduate programs in Linguistics?

Back to Problem Grad School.
APPENDIX D. THE DECISION-MAKING TASK

This appendix contains the directions to the decision-making task, Problem Hawaii. It includes the general directions for both participants as well as the specific directions for each partner.
Problem Hawaii

Background Information

You and your partner both work for a travel magazine with a large audience. Both of you write columns for this magazine, which targets single men between the ages of 20 and 45. However, one of you usually writes articles for readers interested in adventure travel while the other writes articles targeted at more readers interested in high culture. This year, like every year, your boss would like you and your partner to prepare two articles for the winter issue. As Hawaii is a popular winter destination, he has decided that you will both visit Honolulu for the week of January 19th to the 25th.

Together, you have been given a budget of US$5000 to share on transportation, food, hotels and whatever activities you want to write about. However, before you go, your boss would like you to prepare a budget in advance for approval. You need to be careful not to exceed this budget.

Pre-Task
Before you meet, you need to do some research into estimated costs such as transportation, food, hotels, entertainment, etc. Click the links below for extra advice. Remember, don’t spend more than an hour looking up information. If you cannot find an exact total, just estimate how much you might need.

If you’re the Adventure Traveler click here.
If you’re the Cultured Traveler click here.

Task
You will have 20 minutes to talk with your partner online to share your estimated costs and to negotiate a budget. After you have come to an agreement, email your budget torotoro@iastate.edu.
You often write articles targeted at athletes and adventure lovers, many of whom enjoy getting close to nature and sometimes attempt extreme sports. Before meeting with your partner online, you will need to look at activities which your readers will enjoy hearing about.

Below are some ideas of things to look up to help you plan your budget when you search online:

- Transportation cost from your home to Honolulu, Hawaii
- Hotel Accommodations
- Bungee Jumping
- Sky Diving
- Hiking
- Surfing Lessons
- Etc.
Partner 2 - The Cultured Traveler

Your stories target the less adventurous, but more refined traveler. Your readers prefer hearing about exotic and glamorous sights, ethnic cuisine, and high culture. They are more likely to enjoy a day touring museums and historic landmarks and later relaxing in a 5 star restaurant. Before meeting with your partner online, you will need to look at activities which your readers will enjoy hearing about.

Below are some ideas of things to look up to help you plan your budget when you search online:

- Transportation cost from your home to Honolulu, Hawaii
- Hotel Accommodations
- Luau
- Ethnic Cuisine
- Dinner Cruises
- Landmarks and Sightseeing Opportunities
- Etc.
APPENDIX E. PRE-TRIAL QUESTIONNAIRE

This appendix contains the two different questionnaires completed by all participants before beginning the task trials. One questionnaire was given to NS participants and the other to the NNS participants.
Pre-Trial Questionnaire

Before beginning this study, I would like to collect some information from you to help me organize my research and analyze the results. Please answer the following questions honestly and completely. Try not to be excessively modest as that will lead to inaccurate results.

- Pseudonym: 
- Nationality: 
- Native Language: 
- Other Languages Spoken: 
- Age: 
- Major: 

Language Background
1. How many of your close friends are international students?
2. Have you ever tutored or helped international students with their English?
3. If so, what nationalities were they?
4. What foreign languages have you studied?
   For how long?

Tech Background
1. Do you own a computer?
2. How many years have you been using computers?
3. How many hours a day do you spend at a computer?
4. Have you ever used synchronous text-chat programs like CheetaChat, ICQ, Yahoo Messenger, etc? Which ones?
   How often do you use these?
   In what language?
   With whom do you chat?

5. Have you ever used synchronous voice-chat programs like CheetaChat, ICQ, Yahoo Messenger, etc? Which ones?
   How often do you use these?
   In what language?
   With whom do you chat?
6. Please rate your typing ability on the following scale:

1. Poor
2. 2 Finger Typing
3. Fair
4. Average
5. Excellent

25-30 wpm
At least 60 wpm

**Communication/Interaction**

1. Please rate how well you communicate over the telephone:

1. Poor
2. Fair
3. Average
4. Good
5. Excellent

4. Good

2. Please rate how comfortable you feel communicating with non-native English speakers:

1. Very Uncomfortable
2. Uncomfortable
3. Okay
4. Comfortable
5. Extremely Comfortable

3. Do you enjoy problem solving?

4. Do you work better alone, in pairs, or in small groups?
Pre-Trial Questionnaire

Before beginning this study, I would like to collect some information from you to help me organize my research and analyze the results. Please answer the following questions honestly and completely. Try not to be excessively modest as that will lead to inaccurate results.

Pseudonym: ____________________________
Nationality: ____________________________
Native Language: _________________________
Age: ____________________________
Major: ____________________________
TOEFL Score: ____________________________
SPEAK Score: ____________________________

English Language Background
5. How many years have you studied English?
6. How long have you been in the United States?
7. How many of your close friends do you speak English with daily?
8. How many of these close friends are native English speakers?
9. What are your strong points in speaking English? (Check those that apply.)
   Vocabulary  
   Grammar  
   Pronunciation  
   Fluency  
   Listening  
   Speaking & Listening at Natural Speeds
10. What are you weak points in speaking English? (Check those that apply.)
    Vocabulary  
    Grammar  
    Pronunciation  
    Fluency  
    Listening  
    Speaking & Listening at Natural Speeds

Tech Background
7. Do you own a computer?
8. How many years have you been using computers?
9. How many hours a day do you spend at a computer?
10. Have you ever used synchronous text-chat programs like CheetaChat, ICQ, Yahoo Messenger, etc? Which ones?
How often do you use these?
In what language?
With whom do you chat?

11. Have you ever used synchronous voice-chat programs like CheetaChat, ICQ, Yahoo Messenger, etc? Which ones?
   How often do you use these?
   In what language?
   With whom do you chat?

12. Please rate your typing ability on the following scale:

   1  Poor
   2  Fair
   3  Average 25-30 wpm
   4  Good
   5  Excellent At least 60 wpm

Communication Ability and Interaction

5. Please rate how well you communicate in English over the telephone:

   1  Poor
   2  Fair
   3  Average
   4  Good
   5  Excellent

6. Please rate how comfortable you feel communicating with native English speakers:

   1  Very Uncomfortable
   2  Uncomfortable
   3  Okay
   4  Comfortable
   5  Extremely Comfortable

7. Do you enjoy problem solving?

8. Do you work better alone, in pairs, or in small groups?
APPENDIX F. POST-TRIAL QUESTIONNAIRE

This appendix contains the two different questionnaires completed by all participants after completing the task trials. One questionnaire was given to NS participants and the other to the NNS participants.
Post-Trial Questionnaire

Now that you have completed the trials, I would like you to read and answer the following questions. Please feel free to volunteer any information or feedback that will help me improve the tasks or this study.

The Tasks
1. You were given two tasks to complete with your partner, Problem Hawaii, which is known as a decision-making task, and Problem Grad School, which is known as a jigsaw task. Which of the two tasks did you enjoy more? Why?

2. Which task did you do first?

3. Which task was more difficult? Why?

4. Did the order in which you did the tasks matter? (In other words, do you think that doing Problem Hawaii first would have been better for you than doing Problem Grad School first?) Why?

5. How could either of the tasks be improved?

6. How well did the software/hardware work? Did you have any technical problems that made it difficult to do the activities?

7. How often did you use text-chat instead of voice-chat? Why did you use it?

8. Which task gave you and your partner the most opportunities for speaking?

Your Partner
1. How easy/difficult was your partner to understand? Why?

2. How well did your partner explain things?

3. If you didn’t understand something your partner said, what did you do? Why?
4. If your partner didn't understand something you had said, what did he do?

5. Did you ever correct your partner? How?

6. Did your partner use these corrections?

7. Did it become easier for you to understand your partner during the course of the project?

8. How did speaking with a native non-native English speaker affect your English?

9. Were you more careful with your English because you were speaking with a non-native speaker of English?

10. How did not being able to see and interact with your partner affect your ability to communicate or complete the tasks?
Post-Trial Questionnaire

Now that you have completed the trials, I would like you to read the following questions and to think of answers that you can provide me with in an interview. You do not need to write your answers down unless it will help you remember your responses to them. Please feel free to volunteer any information or feedback that will help me improve the tasks or this study.

The Tasks
9. You were given two tasks to complete with your partner, Problem Hawaii, which is known as a decision-making task, and Problem Grad School, which is known as a jigsaw task. Which of the two tasks did you enjoy more? Why?

10. Which task did you do first?

11. Which task was more difficult? Why?

12. Did the order in which you did the tasks matter? (In other words, do you think that doing Problem Hawaii first would have been better for you than doing Problem Grad School first?) Why?

13. How could either of the tasks be improved?

14. How well did the software/hardware work? Did you have any technical problems that made it difficult to do the activities?

15. How often did you use text-chat instead of voice-chat? Why did you use it?

Learning English
1. Which task seemed best for improving your English? Why?

2. Which task required you to be more careful with your English? Why?

3. Which task gave you the most opportunities for speaking?

4. Would these tasks be good for improving your English?

5. At the beginning of this research project, I asked you what your strengths and weaknesses were. Did these tasks confirm what you said?

Your Partner
11. How easy/difficult was your partner to understand? Why?

12. How well did your partner explain things?

13. If you didn't understand something your partner said, what did you do? Why?

14. If your partner didn't understand something you had said, what did he do?
15. Did your partner ever correct you? How?

16. Were these corrections helpful?

17. Did it become easier for you to understand your partner during the course of the project?

18. How did speaking with a native English speaker effect your English?

19. Were you more careful with your English because you were speaking with a native speaker?

20. Did you try to take risks with your English and try new words or phrases? Why?

21. Would you have preferred performing these tasks with another non-native English speaker? Why?

22. How did not being able to see and interact with your partner affect your ability to communicate or complete the tasks?
REFERENCES


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