CONVERSATIONS -- AND NEGOTIATED INTERACTION -- IN TEXT AND VOICE CHAT ROOMS

Kevin Jepson
Monterey Institute of International Studies

ABSTRACT

Despite the expanded use of the Internet for language learning and practice, little attention if any has been given to the quality of interaction among English L2 speakers in conversational text or voice chat rooms. This study explored the patterns of repair moves in synchronous non-native speaker (NNS) text chat rooms in comparison to voice chat rooms on the Internet. The following questions were posed: (a) Which types of repair moves occur in text and voice chats; and (b) what are the differences, if any, between the repair moves in text chats and voice chats when time is held constant? Repair moves made by anonymous NNSs in 10, 5-minute, synchronous chat room sessions (5 text-chat sessions, 5 voice-chat sessions) were counted and analyzed using chi-square with alpha set at .05. Significant differences were found between the higher number of total repair moves made in voice chats and the smaller number in text chats. Qualitative data analysis showed that repair work in voice chats was often pronunciation-related. The study includes discussion that may affect teachers' and learners' considerations of the value of NNS chat room interaction for second language development.

LANGUAGE LEARNING VIA INTERACTION AND REPAIR MOVES

Social interaction is essential to language learning, according to the arguments presented by studies based in the communicative approach to language teaching (see, e.g., Hall & Verplaetse, 2000; Lantolf, 2000; Long, 1983, 1996; Pica, 1994). Empirical evidence suggests that social interaction is a wellspring for negotiation of meaning, a communicative exchange that sustains and repairs conversations (Long 1983, 1996; Pica, 1994). Negotiation of meaning is a cognitive process that speakers use to better understand one another, that is, to increase the comprehensibility of language input. Furthermore, negotiation of meaning may result in modified interaction (Ellis, Tanaka, & Yamazaki, 1994; Pica, 1994; Smith, 2004), which ostensibly optimizes second language acquisition (SLA; Ellis et al., Gass, 1997). Modified interaction, as defined by Long (1983), is partly accomplished through the conversational repair moves of negotiation of meaning, including utterances such as clarification requests, comprehension checks, and incorporations in learners' speech.

In addition to increasing the comprehensibility of input, negotiation of meaning may also raise speakers' awareness of target language forms. Speakers may be alerted that their speech is inaccurate when interlocutors make the repair moves of negative feedback, such as the recasts and explicit corrections interlocutors make to inform speakers of grammatical inaccuracies (Ellis, 1995; Gass, 1997; Long, 1996; Mackey, 1999; Spada, 1997). As a result, if the speaker recognizes the various types of negative feedback provided by interlocutors, the speaker may attempt to self-correct (Long, 1996).

The repair moves related to negotiation of meaning and negative feedback may do more than increase the potential for accuracy and comprehensible input. Swain (1985) emphasized that repair moves force learners subsequently to generate modified output, or self-correction. Swain argued that when speakers seek comprehension using only the receptive modalities of listening, they may not pay attention to their syntactic development. However, when speakers engage their productive modalities by speaking, they may be pushed to pay attention and change their syntactic output in order to communicate effectively. In the same vein of research, Pica (1994) established that non-native speakers (NNS) modify their language

output lexically, syntactically, and phonologically in order to make their messages clearer. Lyster (1998) posited that NNSs pay attention and modify grammatical form and proceduralize their language competence during modified negotiation. Swain (1995) concluded that output may enhance language accuracy in the following four ways: Output may provide learners with opportunities to (a) notice gaps between their language and the target language; (b) test their hypotheses about appropriate target language use; and (c) apply metalinguistic knowledge during the process of noticing gaps and confirming hypotheses. Thus, a speaker's output may lend to second language development by increasing language accuracy, intelligibility, and appropriacy (Lyster, 1998; Pica, 1994; Shehadeh, 1999; Swain, 1995).

In particular, certain conversational repair moves may be more conducive than others to generating modified output (Pica, Holliday, Lewis, & Morgenthaler, 1989) and increased accuracy (Nobuyoshi & Ellis, 1993). Indeed, Pica et al. noticed that the types of repair moves affected the amount of modified output more than the type of tasks in which speakers engaged. Subsequent studies showed that clarification requests in particular pushed speakers to produce modified output that was more accurate both in regards to tense and syntax (Linnell, 1995; Nobuyoshi & Ellis, 1993). Shehadeh (2001) found that self-initiated modified output is important to consider along with other-initiated modified output. Finally, from a pedagogical perspective, the interactionist principles outlined here, including negotiation of meaning and modified output as well as negative feedback, are advocated by many coursebooks, including those by Ellis (1999), Gass and Selinker (2001), Hall and Verplaetse (2000), and Richards (1998), and recently for the computer-mediated communication (CMC) environment by Doughty and Long (2003) as part of their Language Teaching Methodological Principles for CALL (computer-assisted language learning).

Non-Native Speakers Negotiating With Non-Native Speakers

Research on exclusively non-native speaker interaction has most often focused on repair moves made while performing set tasks (see, e.g., Iwashita, 2001; Pica, Lincoln-Porter, Paninos, & Linnell, 1996; Shehadeh, 1999). Iwashita conducted an empirical study of how differences in Japanese NNSs' language proficiency impacted repair moves and modified output in three task types, concluding that groups of learners of either similar or different proficiency levels may derive valuable interactional benefits. In English NNS-NNS task-based interaction, Shehadeh found a greater amount of negotiation stemming from NNS-NNS interactions than from NNS-NS interactions. One study found that the modified interaction and feedback in Japanese NNSs of English was comparable in regards to quality and quantity as NS-NNS interactions (Pica et al., 1996).

At the same time, the benefits of NNS face-to-face "spontaneous" conversational interaction with other non-native speakers have been reported (Ellis et al., 1994; Gass, 1997; Mackey, 1999; Pica, 1994). Varonis and Gass (1985) discovered a greater degree of repair work in conversations between NNSs of diverse backgrounds and English language proficiency, as compared to conversations held by control groups of NS-NNS and NS-NS. Van Lier and Matsuo (2000) corroborated similar findings in three NNS conversations, and both studies found that in conversations between NNSs of similar proficiency and backgrounds, repair moves were used less often. In the text and voice chat environment, NNS dyads were found to produce more negotiation moves than NS-NNS dyads, according to Sauro (2001).

Online Language Learning and Interaction

In the past decade, opportunities for language learning have evolved beyond the limits of time and place that are inherent to face-to-face interaction (Blake, 2000). Electronic wide-area networks, spread across the World Wide Web, connect speakers from a wide range of backgrounds and enable expanded opportunities for social interaction and language learning (Bonk & Kim, 1998). Indeed, the online language learning environment has greatly impacted the cognitive and social aspects of language learning. Interaction patterns sway -- and are swayed by -- the unique social activity of the electronic context. Over their computers and the Internet, early-morning risers from Japan may chat with Brazilian night owls;

English teachers in Florida can teach a multicultural group of students across the globe. Typed messages are used to interact in real-time text chats. These messages have evolved as a new hybrid of spoken, written, and electronic chat discourse (Blake, 2000; Muniandy, 2002; Sullivan & Pratt, 1996; Warschauer, 1996; Werry, 1996). For example, Muniandy and Werry both found that text chat participants used more short forms and contractions than in other written forms. Warschauer and Ortega (1999) found that the discourse of text chats was more complex and formal than face-to-face interaction, yet revealed fewer of the elements of negotiation of meaning and negative feedback.

Likewise, sociocultural patterns have emerged from the anonymous nature of the online environment, where students can participate with nicknames, "faceless." Some participants use Internet chat rooms to play out their fantasy selves, for example (Turkle, 1995). Socioeconomic and gender roles may be reversed (Huff & King, 1988; McGuire, Kiesler, & Siegel, 1987): McGuire et al. found that in networked decision-making experiments, female executives were just as likely as male executives to be the first to suggest proposals, whereas in face-to-face discussions, men were five times as likely to be the first to put forth proposals. Both learning environment and sociocultural patterns are important considerations in language learning, because they certainly influence language development (Lantolf, 2000; Spolsky, 1989). Furthermore, Internet chats may facilitate the conditions for optimal language learning environments (Egbert, Chao, & Hanson-Smith, 1999). Thus, teachers, learners, and researchers alike may have much to gain from the growing distance-learning environment.

Synchronous Text and Voice Chat for Language Learning

The popularity and significance of the synchronous chat room for language learning is increasing; therefore, it is presumably imperative to investigate aspects of language development that may result (Doughty & Long, 2003; Ortega, 1997; Smith, 2003; Warschauer & Kern, 2000). Synchronous chat environments are conducive to investigations of interactionist theory (Blake, 2000; Smith, 2004). In text chat rooms, language learners converse in real-time using personal computers and the Internet to send typed messages, which appear within seconds on their interlocutors' computer screens. Each textual turn appears in the same format in which it was sent, containing the learner's language and typographical errors.

Because of its real-time nature, text chat is lauded for resembling face-to-face interaction, and thus may carry many of the same language development benefits such as negotiation for meaning and repair moves (Smith, 2003; Warschauer, 1996). For example, Sotillo (2000) found that participants in synchronous text chat sessions used interactional modifications similar to those used in face-to-face sessions. A number of studies have noted that NNSs pay more attention to their lexical development than their grammatical development while negotiating for meaning in both networked and face-to-face environments (Blake, 2000; Pellettieri, 2000; Smith, 2003).

Of course, not all aspects of the text chat and face-to-face environments are similar. In text chat, it is possible for several participants to send messages simultaneously and regarding unrelated and previously abandoned topics, thus creating a discourse sequence that is different from face-to-face, where participants often speak in turn on a single topic thread (Doughty & Long, 2003; Negretti, 1999). As a result, the text chat environment may promote more of a need for repair moves due to breakdowns in communication related to topic incoherence (Herring, 1999; Werry, 1996). Furthermore, negotiation routines in task-based synchronous chat may differ slightly from face-to-face interaction, due to features such as potential delay in repair after a communication breakdown and continued negotiation well after an initial repair or piece of negative feedback (Smith, 2003). These features are largely due to the fact that participants in text chat often do not adhere to turn adjacency conventions that face-to-face speakers follow (Smith; Werry).

Even though text chat withstands comparison to face-to-face interaction, it may be that voice chat negotiation routines are an even closer hybrid of face-to-face interaction. In voice chats, learners orally

converse in real-time using personal computers, the Internet, microphones, and earphones or speakers. Each spoken turn is transmitted within seconds, and is broadcast with varying degrees of clarity over the interlocutor's headphones or speakers. Whereas text chat participants in this study did not practice face-to-face turn-adjacency conventions or adhere to discourse coherence structures, voice chat participants did. Unlike face-to-face interaction, however, voice chat speakers cannot see one another or one another's environment, gestures, or facial expressions.

Unlike text chat, there is a meager quantity of published research concerning second languages and voice chat at the time of this writing. The only published study found reported on how two NNSs of English shifted positions of power in task-based interaction depending on which of the two chat room modes they used, either text or voice, and the modality they used, either written or oral (Sauro, 2004). Sauro's findings, however, would not seem to directly contribute to the present study, which investigated cognitive aspects of conversational repair.

Chat, Sociocultural Theory, and Cognitive Processes

Sociocultural corollaries of Internet text chat interaction have been detailed. Various accounts suggest that, as compared to face-to-face interaction, computer-mediated communication (CMC) has an equalizing effect on the quantity and quality of participation across gender, socioeconomic status, and age, because participants feel less anxious or shy (Beauvois, 1992; Kelm, 1992; Kern, 1995; Sullivan & Pratt, 1996; Warschauer, 1996, 2000). Consequently, students may also be more willing to experiment with linguistic forms (Kelm, 1996; Kern; Turbee, 1996, 1999). Warschauer (2000) reported that participants felt a resultant empowerment from discussing topics important to their identities and from increased electronic literacy.

Conversely, an English e-mail discussion list was the basis for learner frustration due to the considerable control teachers brandished during the electronic interaction (Warschauer & LePeintre, 1997). In addition, Sauro (2004) questioned the idea that electronic chat rooms necessarily engender democratic relationships, discovering a shifting power relationship between the same two speakers in text and voice chat rooms. Even so, text chat seems to enable participants from varying levels of expertise to assist one another in co-constructing social activity (Ortega, 1997; St. John & Cash, 1995; Schultz, 1996; Warner, 2004).

Research on sociocultural corollaries of text chat has been complemented by investigations into cognitive processes and resulting modified interaction (Pellettieri 1996, 2000; Iwasaki & Oliver, 2003; Smith, 2003, 2004), which are more closely related to purposes of the present study. In the electronic realm, repair moves in English NS-NNS electronic text conversations have been confirmed (Rodriguez, 1998; Smith, 2004). Smith (2003) discovered in a study of task-based (teacher-set or teacher-led) chat that about one third of the total turns taken by English learners were related to negotiation. In a study of NNSs and teachers in English for Academic Purposes (EAP) classes, chat tools were used in set tasks between NNSs and teachers as well as exclusively amongst NNSs to negotiate meaning regarding both language and content (Chen, Belkada, & Okamoto, 2004). Similarly, Smith (2004) found that task-based text chat engendered negotiation of meaning as well as short-term SLA amongst NNSs of English, especially surrounding attempts to resolve confusion over lexical items.

In research on languages other than English, Pellettieri (1996, 2000) suggested that electronic, task-based, synchronous text discussions between Spanish NNS university students triggered a higher degree of repair work than did face-to-face interaction. In addition, the task-based chats facilitated negotiation of meaning that was meaning- and form-related. In a separate study of task-based text chat, Spanish L2 participants who were part of an experimental group of teacher-led chat and classroom interaction demonstrated gains in their oral proficiency that were greater than their counterparts in the control group of teacher-led classroom interaction (Payne & Whitney, 2002). Meanwhile, a study of negative feedback given by Japanese NSs to their NNS partners found that the NNSs were able to use negative feedback as a

means to modify their output in task-based chat room interaction (Iwasaki & Oliver, 2003). The authors concluded that NNSs used more than a quarter of NS negative feedback in their subsequent production, a figure which was considered useful but lower than in previous face-to-face studies.

Tudini's (2003) research is more closely related to the conversational variable of the present study, in that the research explored open-ended conversations regarding a set topic between Italian NSs and NNSs in text chats. Tudini discovered that speakers engaged in modified interaction, triggered mainly by lexical confusion, which could facilitate SLA. When investigating open-ended text chat conversations between Japanese NSs and NNSs, Toyoda and Harrison (2002) also discovered several triggers for repair moves and recommended that teachers attend to those triggers in task-based interaction. In light of these studies, the conversational mode of chat interaction is possibly significant to interactionist theories of second language development: Language learners may benefit from the opportunity to negotiate meaning in entirely authentic target language settings. Furthermore, authentic, conversational settings, which are typical of many online text and voice chat rooms, are often the most practical and accessible for people across the globe who are attempting to learn English.

Sauro's (2001) unpublished work with text and voice chat and negotiation of meaning, which was set in task-based interactions, found that voice chat technology generated more challenging tasks for learners. However, as relates to the present study, published research concerning conversational repair moves between English NNSs in text and voice chats seems to be nonexistent at the time of this writing, which, along with the substantial amount of NNS interaction in text and voice chat rooms across the Web, implies that this study may be essential. As related to voice chat, the absence of research may be explained by the fact that voice-based chat technology is relatively new to online language schools. In any case, substantive research has emphasized the value of NNS conversations for language development (Nakahama, Tyler, & van Lier, 2001; Schwartz, 1980; van Lier & Matsuo, 2000; Varonis & Gass, 1985). Nakahama et al. (2001) acknowledged that conversational repair moves, as one facet of face-to-face conversation, may contribute to second language development. Hence, because of the potential value of NNS-NNS interaction for SLA, its practicality for language learners, and the increasing availability of chat rooms for conversation-based language learning, NNS-NNS conversational repair moves in both text and voice synchronous chat rooms deserve further investigation.

Repair Moves in Text and Voice Chats

The purpose of the exploratory research reported here was to investigate the differences in the repair moves used by NNSs during conversations in synchronous Internet chat rooms when (a) the chat was text-based and (b) the chat was voice-based. Because I am unaware of previous research conducted for this purpose, alpha level was set at .05 under a nondirectional (two-tailed) hypothesis. The research design is best described as mixed methods (Creswell, 2003), thus contrasting with the dominant experimental paradigm. Hypotheses were posed and tested in order to reveal any significant differences between the two pre-existing groups (text and chat); therefore, in the experimental tradition, the design is closest to ex post facto criterion groups (Hatch & Lazaraton, 1991; Shavelson, 1981). Naturalistic inquiry was used in the data collection process, with no attempt to influence the composition of the groups or the data produced (Nunan, 1992). At the same time, the data were categorized in the tradition of discourse analysis (Nunan). In addition, the data analysis bears interpretive discussion, often associated with interaction analysis (Nunan). The design is exploratory-quantitative-statistical (Grotjahn, 1987), and falls under the non-interventionist, structured "measuring" category, according to van Lier (1988).

This study addressed the following questions: (a) Which types of repair moves occur in text and voice chats; and (b) What are the differences, if any, in the repair moves in text chats and the repair moves in voice chats when time is held constant? This investigation was justified by (a) previous research supporting the benefits of NNS-NNS interaction and the absence of parallel research in conversational chat rooms, and (b) questions surrounding the potential value, as measured by various repair moves, of

both text and voice conversational chat rooms in providing opportunities for authentic target language interaction that is presumed to be conducive to second language development.

METHOD

The study was conducted in November 2002 by comparing repair moves performed by NNSs in five 5-minute sessions of text chat interaction and, concurrently, in five 5-minute sessions of voice chat. Data were collected concurrently from the two environments.

Participants

The participants seemed to be NNSs of English at e-English,[1] the world's largest private, online English language school, according to the company's Web site. The school ostensibly serves teenagers and adult learners and offers business, test preparation, industry-specific, travel, and general English courses. The number of participants in this study was set by the number of NNSs who actively participated in the random chat sessions sampled -- averaging six in the text chats and three in the voice chats. An active participant was defined as one who sent at least one message or spoke at least once during the 5 minutes. Although it was not possible to select sessions with the same number of participants, sessions occurring at the exact same time of day were selected in an attempt to control for possible shifts in energy levels, lifestyles, and other variables that might consequently affect participation.

Participants were anonymous and used nicknames. They presumably logged in to the chat room willingly. Because of the inherent anonymity of the environment, participants rarely explicitly revealed personal background regarding gender, ethnicity, socioeconomic status, age, education, or native language. The gender of the participant was often identifiable due to the sound quality of the participant's voice; however, the participant's gender could not be verified simply by voice quality. Thus, the focus on physical and personal characteristics was largely absent from both text and voice chats, and aural cues were absent from the text chat as well. Anonymity and the electronic environment presented an opportunity for language, specifically chat room language, to be emphasized.

The participants may have logged-in to the chat rooms for a multitude of reasons, including English language practice. All participants used English as the main language of communication. At the same time, many participants seemed to be bilingual or multilingual, and code switched frequently. In addition, participants seemed to belong to a group of people distinguished by multiple literacies, including varying degrees of reading, writing, and electronic literacies, and access to the Internet. There was session-to-session variation in participants, that is, the set of participants who were active on a Saturday at 8:54 a.m. weren't the same set of participants active on a Monday at 9:51 a.m. Thus, there was no way to influence participant selection or to determine initial differences in participants. Certainly, the nature of the chat environment defied certain measures of research control due to some of the same factors that also made chat a unique opportunity for exploration.

On the other hand, the environment inherently supported research control as well. For example, it could be argued that participant assignment was naturally random. Internal threats to validity posed by people issues, such as the Hawthorne effect (Mayo, 1933), the halo effect, or participant expectancy were minimized because participants did not know they were being observed (Hatch & Lazaraton, 1991; Smith, 2003): I did not identify myself or participate (a "loitering" approach, which is acceptable chat room protocol). Participants were anonymous and their identities remained disguised in this research, thus meeting ethical guidelines set by the American Psychological Association (2002).[2]

Equipment and Materials

A personal desktop computer running Windows 98 on a local-area network, cable modem connection to the Internet was used to log-in to text chats at e-English. Simultaneously, a personal electronic notebook computer running Windows XP with a local-area network, cable modem connection to the Internet was

used to log-in to voice chats at e-English. e-English makes five chat rooms available for each of the text and voice chats: Time to Meet, Re: English, Business, Hobbies, and Global Village. The name of the chat room seemed to have minimal, if any, effect on the data. Observations revealed that Hobbies and Global Village were rarely used, and that the chat conversation topics never seemed to be related to the name of the chat room. For example, participants seemed to introduce themselves, and then speak about their native countries and the languages they speak regardless of the name of the chat room.

Text chats use e-English Java applet technology to facilitate instant messaging between participants. Voice chats use a proprietary Voice-over Internet Protocol (VoIP) telephony[3] called HearMe, owned by PalTalk.[4] Messages in the text sessions, which automatically appear on the computer screen, were copied and pasted into a Microsoft Word document and used as transcriptions for analysis. Due to the nature of the chat technology and the equipment used, it was not possible to observe if participants edited their own messages before they sent them. Therefore, some self-correction repair moves may not have been measurable (personal communication, LLT blind peer-review, October 19, 2004). Further research using equipment that records keystrokes might reveal information about additional, hidden self-correction moves by text-chat participants (LLT blind peer-review). Such research might help contribute to measures of self-correction and internal processing in the SLA field at large. Indeed, SLA research has not yet established what degree of self-correction occurs in face-to-face interaction as part of speakers' quiet or silent inner speech (Long & Robinson; 1998; Ohta, 2000).

The voice sessions, for which transcripts were not automatically generated, were recorded live using Microsoft's digital Sound Recorder and then manually transcribed using word processing software. Because the participants most likely logged-in from different computer stations, it was impossible to control for environmental factors such as computer operating system, peripherals, including microphone and earphone, and Internet connection bandwidth. Variations in these environmental factors may have affected each participant's quantity and quality of participation.

Procedures

The study consisted of 10 groups (NNSs in 5 conversational text chat sessions and NNSs in 5 conversational voice chat sessions), observed for 5 minutes during five different sessions on five different days. I signed up for an e-English user nickname (kjepson_kevin) and logged-in, without any unusual access or procedures. I observed the participants conversing in both the text and voice chats. I electronically copied and pasted the text messages regularly, as the technology only allowed for a maximum number of lines before the oldest messages disappeared from the screen. The messages were saved in a Microsoft Word document for later analysis.

At the same time that I copied the messages from the text chat, I recorded the conversation in the voice chat room. The recorded digital audio file was then saved for transcription and analysis. I recorded at least 5 minutes in order to provide a cushion against long periods of silence or disruption. After at least 5 minutes of copying and recording, I logged-off of both the text and voice chats. Again, the environmental conditions were not controlled, save for consistent use by all participants of some form of computer with Internet access.

Voice chat turn-taking was transcribed, revealing long periods of silence (pauses) between turns. Pauses sometimes lasted about one minute. VoIP technology has yet to be perfected, often resulting in lapses between the real-time utterances of interlocutors. I am unaware of previous research that has documented the length of pauses and the role of pauses in voice chats. For the present study, a pause of zero to six seconds between turns was established as a norm in voice chat conversation; all pauses beyond six seconds were noted. Care was taken to examine 5 minutes worth of actual oral data. Further research might illuminate conventions for pauses in voice chat, whether they are related to the technology or to language proficiency, and how they affect the social and cognitive factors of language development.

ANALYSIS AND DISCUSSION

Measures of Repair Moves

Repair moves were operationalized and counted according to two categories, Negotiation of Meaning (NOM) and Negative Feedback (NF) as shown in Table 1.

Table 1. Codes and Operationalizations for Repair Moves in Text and Voice Chat Sessions

<table>
<tr><th></th><th>Negotiation of Meaning
(NOM; Long, 1983)</th><th>Negative Feedback
(NF, Long, 1996)</th></tr>
<tr><td rowspan="3">Interlocutors
(responding to text or speech initiated by another speaker)</td><td>CR: clarification requests
e.g., What do you mean by X?</td><td>R: recasts (the interlocutor corrects the speaker's word or utterance by repeating it in its correct form)
e.g., This city is beautiful in response to speaker's This city beautiful.</td></tr>
<tr><td rowspan="2">CC: confirmation checks
e.g., Did you mean/say X?</td><td>EC: explicit correction (the interlocutor tells the speaker of his/her mistake)
e.g., You should say, this city is beautiful.</td></tr>
<tr><td>Q: questions (the interlocutor asks a question in order to prompt the speaker to make a correction)
e.g., Can you try that again?</td></tr>
<tr><td rowspan="3">Speakers
(initiating text or speech)</td><td>COMP C: comprehension checks
e.g., Do you understand?</td><td>I/F: incorporations (speaker repairs utterance based on interlocutor feedback; Lin & Hedgcock, 1996)
e.g., in response to a correction, Sorry, this city is beautiful.</td></tr>
<tr><td>SR/P: self-repetition or paraphrase
e.g., Which / pli:s / uh, / pli:s /, uh which landmark can I visit</td><td rowspan="2">SC: self-corrections (the speaker initiates adjustments to her or his own previous errors without assistance from the interlocutor)
e.g., This has beeb, I mean been, great.</td></tr>
<tr><td>I: incorporations (speaker repairs utterance based on interlocutor cues; Lin & Hedgcock, 1996)
e.g., in response to a clarification request, Yes, I mean X.</td></tr>
</table>

After the data were collected (and transcribed from voice chats or copied from text chats), repair moves were coded with the acronyms shown in boldface type as in Table 1. The data were coded from the perspective that an interlocutor is the person making a repair move, and the speaker is the person making an utterance that triggers an interlocutor's repair move. In order to establish inter-coder agreement, two coders normed according to the preceding framework coded 20% of the data. First, the coders coded two half-sessions each of text and voice chat (four half-sections), discussing discrepancies as they coded. Then, the two coders independently coded another two half-sessions each of text and voice chat (Chaudron, 1988). Coders agreed on 89% of their coding, suggesting that the data were coded with strong consistency.

Quantitative Methods

The data analysis determined that both voice and text chats contain repair moves, namely clarification requests, confirmation checks, self-repetitions, incorporations, recasts, and explicit corrections. However, the data analysis showed no evidence of certain types of repair moves, namely comprehension checks, questions, and self-corrections. Quantitative methods were used to test null and alternative hypotheses:

Null hypothesis: The observed distributions of frequencies of the repair moves in text chats and the repair moves in voice chats equals the expected distributions of frequencies when time is held constant.

Alternative hypothesis: The observed distributions of frequencies of the repair moves in text chats and the repair moves in voice chats does not equal the expected distributions of frequencies when time is held constant.

Significant differences in the number of repair moves were investigated with one-way chi-square (and Yates' correction for continuity) or Fisher's exact test (Shavelson, 1981; Siegel, 1956). (In instances where expected frequency levels fell below 10 in two-way chi-square designs, Fisher's exact test was used instead of chi-square, as suggested by Shavelson). All chi-square calculations showing significant differences (applicable in this data to *df* =1 only) were also calculated with *phi* (ϕ) for strength of association, which attempts to minimize the effect of sample size and degrees of freedom on the chi-square statistic (Hatch & Lazaraton, 1991).

Chi-square assumptions were met for this analysis because

1) the repair move (dependent) and chat type (independent) variables were nominal;
2) the repair moves were represented by frequency counts;
3) each repair move was counted in only one level of a variable, so that the data were independent -- no entries were double-coded; and
4) *df* = 1, so all expected frequencies will be greater than or equal to 10 (Hatch & Lazaraton, 1991; Shavelson, 1981).

Because there was no previous empirical evidence for relationships or directionality of these counts of repair moves in conversational chat rooms, the null hypothesis of equal distribution was adopted. Because this is exploratory research, alpha was set at .05. When the observed chi-square was greater than the critical value, or when Fisher's exact probability was less than the set probability level of .05, the null hypothesis was rejected. Thus, it was assumed that the probability was less than 5% that the differences were due to chance (Shavelson, 1981).

Each instance in each category for each participant was counted. The data were then analyzed from five different angles, in five steps:

Step 1: significant differences in repair moves produced in text versus voice chat

Step 2a: significant differences of NOM repair moves produced in text versus voice chat

Step 2b: significant differences of NF repair moves produced in text versus voice chat

Step 3: significant differences of NOM repair moves versus NF repair moves produced in combined chats

Step 4: significant differences of clarification requests versus other types of NOM repair moves produced in combined chats

Repair Moves in Text Versus Voice Chat

In Step 1, all of the instances of repair moves that each participant produced in each 5-minute session for both types of chat room were totaled. This analysis produced an overall picture of repair moves (see Table 2).

Table 2. Step 1: Frequency of Participant Repair Moves in Text and Voice Chat Sessions

	Text (5 sessions)	**Voice (5 sessions)**	**Total *(N)***
Repair Moves	8	39	47
	$\chi^2 = 19.14$	Reject null hypothesis	$\phi = .64$

Chi-square results ($\chi^2 = 19.14$, $p = .05$) show that voice chat generated a number of repair moves that was significantly higher than the number in text chat. In addition, the *phi* coefficient ($\phi = .64$) shows that the association between the repair moves and chat type variables is strong.

Negotiation of Meaning in Text Versus Voice Chat

In Steps 2a and 2b, a close-up analysis of frequencies of NOM and NF repair moves was attempted. Table 3 shows the contingency table for Step 2a:

Table 3. Step 2a: Frequency of Participant Negotiation of Meaning Repair Moves in Text and Voice Chat Sessions

	Text (5 sessions)	**Voice (5 sessions)**	**Total *(N)***
Negotiation of Meaning	6	36	42
	$\chi^2 = 20.02$	Reject null hypothesis	$\phi = .69$

Chi-square results ($\chi^2 = 20.02$, $p = .05$) show that voice chat generated a number of negotiation of meaning repair moves that was significantly greater than the number in text chat. In addition, the *phi* coefficient ($\phi = .69$) shows that the association between the NOM repair moves and chat type is strong.

Negative Feedback in Text Versus Voice Chat

Table 4 shows the frequency of NF moves in text and voice chat, revealing that expected frequencies fell below ten. Because the chat sessions were classified on one dimension only (negative feedback), Fisher's exact test was not an appropriate test for significant differences. Furthermore, the cells could not be collapsed to accommodate the insufficient expected frequencies. Therefore, NF will be addressed further in qualitative analysis.

Table 4. Step 2b: Frequency of Participant Negative Feedback Repair Moves in Text and Voice Chat Sessions

	Text (5 sessions)	**Voice (5 sessions)**	**Total *(N)***
Negative Feedback	2	3	5
	$F_E = 2.5$	does not meet assumptions for statistical analysis	

Negotiation of Meaning Versus Negative Feedback in Combined Chats

Table 5 provides a wide-angle lens, showing both NOM and NF in text chats combined with voice chats and an analysis via one-way chi-square. Table 5 shows that NF types of repair moves were used significantly less frequently ($\chi^2 = 27.58$, $p = .05$) than NOM types of repair moves.

Table 5. Step 3: Frequency of Total Participant Negotiation of Meaning Versus Negative Feedback Repair Moves

	Negotiation of Meaning	**Negative Feedback**	**Total *(N)***
Text & Voice Chat	42	5	47
χ^2 obs = 27.58, χ^2 crit = 3.84, $p = .05$		Reject null hypothesis	$\phi = .77$

The *phi* coefficient (ϕ =. 77) shows there is a strong association between electronic chat and the type of repair moves used.

Clarification Requests Versus other NOM Repair Moves

Additionally, clarification requests were used more often than other negotiation of meaning repair move types in the chats, although the observed frequencies were not significantly different than the frequencies of other repair moves, as shown in Table 6:

Table 6. Step 4: Frequency of Negotiation of Meaning Repair Move Types in Combined Chats

	Clarification Requests	**Confirmation Checks**	**Comprehension Checks**	**Self-Repetition**	**Incorporations**	**Total *(N)***
Text & Voice Chat	18	9	0	8	7	42
			χ^2 obs = 7.33, χ^2 crit = 7.82, p = .05		Accept null hypothesis	

Qualitative Procedures

Comprehension Checks, Questions, and Self-Correction

To complement this discussion of statistical differences, it is interesting to examine the data from a qualitative perspective. As discussed earlier, clarification request, confirmation check, self-repetition, recast, explicit correction, and incorporation repair moves were found in the chats. Comprehension checks, questions, and self-correction repair moves were not used. Perhaps comprehension checks and questions are primarily pedagogical by nature (Long & Sato, 1983), and are thus scarce in NNS electronic conversation. Self-corrections may be rare because speakers do not notice their errors, and thus would not see the need to correct them. Additionally, self-correction is largely dependent on the social context, and it may be that NNS electronic chats are not fora conducive to self-correction (Kormos, 1999). Learners may not see the need for accuracy, for example, or may perceive self-correction as face threatening. Perhaps the same reasoning can explain why negative feedback repair moves were used significantly less than negotiation of meaning repair moves: Participants may simply feel uncomfortable giving negative feedback or they may be unable to provide negative feedback.

Clarification Requests

Clarification requests were the most prominent repair move in both chat types, a finding that is paralleled by NS-NNS face-to-face conversation research (Long & Sato, 1983). In this study, an exchange between "M.M." and "Helena" (Example 1) demonstrated how clarification requests followed by confirmation checks not only allow the interlocutor ("Helena") to check previous utterances, but also encourage the speaker ("M.M.") to elaborate on and sustain the conversation:

Example 1

M.M.	uh, Helena, Helena, if I go to Taiwan, which (place) /pli:s/, which /pli:siz/ can I visit Taiwan, Helena?
Helena	I beg your pardon me, I didn't catch you …
M.M.	I go to Taiwan, uh, wha uh what /pli:s/ can I visit?
Helena	Oh, you mean, sightseeing?
M.M.	Uh, what landmarks what landmarks … can I visit in Taiwan?

Clarification requests have been found to be valuable in prompting speakers to modify their output (Lyster, 1998; Pica et al., 1989) and produce language that is more accurate (Linnell, 1995; Nobuyoshi &

Ellis, 1993). Expanded research could reveal the reasons for the popularity, functionality, and effectiveness of clarification requests in both types of electronic conversations.

Success of Repair in Voice Chats

Speakers in voice chat seemed to repair their utterances more often than speakers in text chat, resulting in greater incorporation of negotiation of meaning repair moves. It seems, then, that the repair cycles were more often successfully completed in voice chat, with speakers more frequently repairing utterances based on their interlocutors' cues. When speakers repair their utterances, thus incorporating interlocutor repair moves and producing comprehensible, modified output, interlanguage development may be promoted (Wesche, 1994). For example, "Junko" successfully repaired a pronunciation error after "Moo-soon's" clarification request in Example 2:

Example 2

Moo-soon	I'm sorry, you are what? You are /wIk/?
Junko	Not /wIk/, but **weak.**

One reason for the higher number of incorporation repair moves in voice chats may be the conversational pace, which is inherently slower than in text chats. Text chat messages were usually delivered within a period of seconds; voice chat participants sometimes waited up to about one minute between turns, thus perhaps allowing more time for incorporation repair moves. Additionally, there were always fewer participants in voice chats than in text chats, thus perhaps enabling voice chat participants to contribute more often. In other words, the odds for incorporation repair moves were greater in voice chats. Further research might reveal why voice chat creates longer pauses -- perhaps the voice chat technology did not always allow for instant delivery. Explanations as to why voice chat may draw fewer participants should also be pursued – perhaps the voice chat technology is harder to access and harder to use.

Self-Repetition in Voice Chats

Self-repetition was used fairly often in voice chats, but not at all in text chats. The absence of self-repetition in text chats could be explained by the fact that text chat interlocutors can review one another's previous entries on the computer screen while they are chatting, thus reducing or eliminating the need for self-repetition. Additionally, the voice chat exchange between "M.M." and "Helena" provided above suggests that "M.M." used the self-repetition/ paraphrase repair move four times in four turns in an effort to repair a pronunciation-related breakdown (successfully, in the end). "M.M." repeatedly used the repair move, perhaps revealing that "M.M." was determined to make use of strategic competence, but also possibly because "M.M." has a limited range of strategies for repairing conversation breakdowns.

Pronunciation Repair as a Benefit of Voice Chat

A qualitative analysis also reveals that voice chats may be unique: Speakers used a significantly higher number of repair moves in voice chats, a finding corroborated by Sauro (2001), although Sauro did not count negotiation routines related to inaudibility or technical problems. This study also found evidence of pronunciation repair moves, though speakers seldom incorporated pronunciation repair. As would be expected, text chats did not engender pronunciation repair. Furthermore, pronunciation-related repair moves constituted the bulk of all of the repair work in voice chats, as shown in Table 7.

Table 7. Frequency of Pronunciation-Related Repair Across Categories of Repair Moves

	Clarification Requests	**Confirmation Checks**	**Self-Repetition**	**Explicit Correction**
Pronunciation- Related (%)	33	32	52	56

More than half of the self-repetition and explicit correction repair moves, and a third of the clarification requests and confirmation checks made across the 10 sessions were directed at pronunciation repair in the voice chats, suggesting that conversation breakdowns were often pronunciation-related. Further research into voice chat repair moves could potentially produce a wellspring of findings on pronunciation work and its impact on modified output. Further research might also address the relative importance and proportion of repair moves as compared to other conversational features, such as moves that sustain conversation. Finally, significant sociocultural themes, such as the use of humor and flirting in building the chat communities, were noted in the data. Further research based on sociocultural theory would likely unearth a plethora of data from conversational chat rooms with NNS participants.

CONCLUSION

The present study focused on an area not yet highlighted by language research: conversations among English L2 speakers in Internet text and voice chat rooms. This study reported on the types of repair moves that occurred in text and voice chats, noted significant differences, and qualitatively explored data patterns.

Limitations

A possible threat to internal validity was that participants were not randomly sampled. Because the participants were anonymous and seldom revealed personal profile data, participants could not be randomly sampled. For example, cultural differences in the acceptability of making repair moves could not be addressed, a variable which in turn may represent a threat to the external validity of the results. The threat was minimized, however, since the study observed random participants in five separate sessions. Nevertheless, the findings may not be generalizable to the population.

Other variables may influence the number of repair moves as well. For example, participants operating at equal levels of proficiency may often have clearly understood one another due to other types of conversational features, such as choosing appropriate topics or discourse markers (van Lier & Matsuo, 2000), thus eliminating the need for repair moves. Hence, the greater number of repair moves (including pronunciation-related moves) in the voice chat context may be a result of confounding variables, such as poor reception due to technological problems. Additionally, Long's (1983) perspective on negotiation of meaning as an indicator of successful conversation has been challenged by van Lier and Matsuo, who expressed negotiation of meaning as a series of repair moves that signal a failure in communication and only a speaker's subsequent attempt to address conversation problems. In fact, van Lier and Matsuo questioned the very value of repair moves as a primary indicator of language acquisition, saying that "…frequent repair indicates conversational trouble, and more conversational trouble can mean less conversational success…" (p. 267).

Strengths

This study contributes to the discussion of repair move interaction by discussing the benefits of conversational, synchronous chat between English L2 speakers, and seemed to be completely free from the effects of observer's paradox (Labov, 1972). The study examined qualities that naturally and uniquely occurred in the anonymous, synchronous chat room environment -- the focus on written and spoken language devoid of the gestures, expressions, and additional tools inherent to other environments, for example. Reliability was strengthened by observing numerous chat rooms with similar profiles, thus minimizing extraneous factors. By providing qualitative as well as quantitative data analyses, concurrent triangulation was employed to address weaknesses (or possible negative results) inherent to a singularly quantitative or qualitative approach (Creswell, 2003).

Teachers and learners may want to consider the potential language learning opportunities created by repair negotiation between NNSs in text or voice chat room conversations. For example, chat room

conversation is, for many, an easily accessible environment for language practice, especially for learners who do not live in target language-speaking areas (Blake, 2000; Doughty & Long, 2003). In addition, chat is often a free format in which to practice a language. Teachers may therefore want to direct learners to text and voice chat environments to provide out-of-class language and negotiation work. Although more research is needed, this study found that conversational chat rooms do facilitate repair moves, which are thought to be beneficial to second language development. Teachers may wish to systematically include out-of-class chat room practice as part of course syllabi. Learners might thus benefit from the kind of target language practice that may be more closely matched to their real-world needs. Furthermore, using simple and widely-available materials and equipment, learners may print chat logs or record chat interactions and then conduct further analysis in the classroom.

Whereas many types of repair moves were found -- specifically, clarification requests, confirmation checks, self-repetitions, recasts, explicit corrections, and incorporation repair moves -- clarification requests were used most often. Participants used the repair moves of negative feedback significantly less frequently than negotiation of meaning repair moves. Therefore, it is possible that NNS conversational chat may not engender the type of repair move that is thought to force learners to focus on grammatical accuracy through their output. Further research on NNS conversations in chat rooms could expand on hypotheses related to grammar-oriented modified output.

This study suggests that although text chat is the more widely available and most studied form of chat, voice chat offers an environment in which learners are more apt to negotiate for meaning. Voice chats in this study generated a number of repair moves, specifically negotiation of meaning-type repair moves, which was significantly higher than the number in text chat. Conversations in voice chat rooms would thus seem to benefit learners in the repair move aspects of language development, especially in pronunciation repair and in the incorporation of repair moves. Indeed, the data provided evidence that many of the repair moves were made in efforts to attend to pronunciation breakdowns in particular. Because of the inherent absence of non-verbal communication and the focus that current voice chat technology places on pronunciation, voice chat may be an optimal environment for pronunciation work. Additionally, with the increasing availability and affordability of online chat technology, including the growth of Internet protocol telephony, voice chats may become increasingly popular. Therefore, teachers and learners may wish to consider the voice chat environment not only to assess, discuss and practice phonology, but as a potentially rich venue for NNS conversations and language development.

NOTES

1. The names of the online English school, the school's course names, and all of the school's students, who were participants in this study, have been changed to protect the students' records and identities.

2. Sections 4.07 and 8.03 of the APA Ethics Code Draft 7 state:

> 4.07 Use of Confidential Information for Didactic or Other Purposes. Psychologists do not disclose in their writings, lectures, or other public media, confidential, personally identifiable information concerning their clients/patients, students, research participants, organizational clients, or other recipients of their services that they obtained during the course of their work, unless (1) they take reasonable steps to disguise the person or organization, (2) the person or organization has consented in writing, or (3) there is legal authorization for doing so.
>
> 8.03 Informed Consent for Recording Voices and Images in Research. Psychologists obtain informed consent from research participants prior to recording their voices or images for data collection unless (1) the research consists solely of naturalistic observations in public places, and

it is not anticipated that the recording will be used in a manner that could cause personal identification or harm.

3. The voice chat technology used in this study is a type of Voice-over Internet Protocol (VoIP). With VoIP, phone connections are assigned to computer addresses, similar to the way in which network printers are assigned to computer addresses. Instead of using a VoIP telephone (as many VoIP users do), participants in this study used a VoIP-connected computer, a microphone, and speakers to participate in audio sessions.

4. HearMe produced software enabling voice conferencing (VoIP) until October 2001 when the company ceased operations. In December 2001, New York-based Paltalk acquired assets of HearMe. PalTalk provides video conferencing, instant messaging, voice e-mail, and video e-mail over the Internet in addition to the HearMe VOIP conferencing technology.

ABOUT THE AUTHOR

Kevin Jepson specializes in ESL curriculum development, assessment, and technology-enhanced, situated learning. He is an ESL editor at CTB/McGraw Hill and has worked for the Monterey Institute of International Studies (MIIS), Heinle, and GlobalEnglish. He graduated with distinction from MIIS with an MA-TESOL and CALL Certificate in 2002.

E-mail: kevin.jepson@sbcglobal.net

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