

COMPUTER MEDIATED COMMUNICATION: A WINDOW ON L2 SPANISH INTERLANGUAGE ¹

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ABSTRACT

The Interaction Hypothesis states that the conditions for SLA are crucially enhanced by having L2 learners negotiate meaning (i.e., resolve their miscommunications) with other speakers, native or otherwise (Long & Robinson, 1998, p. 22). This study demonstrates that incidental negotiations commonly occurred in networked learner/learner discussions as well, especially with respect to their lexical confusions. Fifty intermediate L2 Spanish learners were asked to carry out networked discussions in pairs during their lab time using a synchronous chat program, *Remote Technical Assistance* (RTA), which records all textual entries. Each dyad carried out a series of online tasks that can be described as jigsaw, information-gap, or decision-making. The results show that jigsaw tasks appear to lead the way in promoting negotiations, as Pica, Kanagy, and Falodun (1993) had previously predicated, but that information-gap tasks were not nearly as productive as a stimulus. The findings suggest that computer mediated communication (CMC) can provide many of the alleged benefits ascribed to the Interaction Hypothesis, but with greatly increased possibilities for access outside of the classroom environment. Nevertheless, the predominance of incidental lexical negotiations, in contrast to the paucity of syntactic negotiations, leaves unanswered or unsatisfactorily addressed the issue of grammatical development. The study demonstrates, however, the value of synchronous chat records as a window for investigating interlanguage.

BACKGROUND AND GOALS

From the L2 students' point of view, there exists a relatively long period in which they struggle to communicate in the target language via their own interlanguage, an emerging linguistic system (Gass & Selinker, 1994, p. 11). In order to move toward the target language, SLA research suggests that students must first focus on their own linguistic deficiencies vis-à-vis the target language--what some researchers have described as "noticing the gap" or apperception (Gass, 1997, p. 4). In other words, L2 learners must develop their own metalinguistic awareness in order to stimulate a change in their interlanguage (Schmidt, 1990; Schmidt & Frota, 1986, pp. 306-319).

One way of provoking students to develop this sense of what still needs to be learned consists in having them attempt communication tasks that require them to negotiate the meaning of the message in order to succeed at exchanging information. When working in pairs to solve real communication tasks, students typically encounter linguistic problems, be they lexical, grammatical, phonological, semantic, or pragmatic in nature. At the point that one partner notices a gap or suffers some confusion, the pair will suspend the normal flow of the conversation or "push-down," as it were, from the discourse of the task itself in order to resolve their miscommunication (Gass, Mackey, & Pica, 1998, p. 301; Varonis & Gass, 1985; Gass, 1997). In Gass' words (1997, p. 107), "Negotiation here refers to communication in which participants' attention is focused on resolving a communication problem as opposed to communication in which there is a free-flowing exchange of information." These negotiations often result in the correction of specific mistakes and promote the evolution of the L2 learner's interlanguage toward the target.

In particular, Pica, Kanagy, and Falodun (1993) have predicted that jigsaw and information-gap tasks will promote more of these negotiations than other task stimuli. When working in dyads, jigsaw tasks provide each partner with only half of the information needed to solve the communication task; the partners must share their respective parts equally (i.e., two-way task) and then try to converge on a single outcome. Information-gap tasks assume only one person holds the pertinent information, which the other partner must solicit (i.e., this constitutes a one-way task, but the task can be repeated with the roles reversed to form a two-way task), whether or not a unique outcome is predictable.

Long and Robinson (1998, p. 22) have subsumed this process of negotiation of meaning under the *Interaction Hypothesis*, which states that the conditions for SLA are crucially enhanced by having L2 learners negotiate meaning with other speakers, native or otherwise. Among the benefits cited, these negotiations tend to increase input comprehensibility through language modifications--such as simplifications, elaborations, confirmation and comprehension checks, clarifications requests, or recasts--which end up providing the L2 learner with the type of negative evidence deemed necessary by some SLA theories for continued language development (Gass, 1997, p. 143; Long, 1996; White, 1991). This type of negotiation is also described in the literature as Focus on Form, and is defined by Long (1991, pp. 45-46) as follows:

Focus on *form* . . . overtly draws students' attention to linguistic elements as they arise *incidentally* [italics added] in lessons whose overriding focus is on meaning or communication.

This is not to say that the Interaction Hypothesis can claim that these types of negotiations in and of themselves *cause* SLA, but rather that tasks which promote negotiations of meaning create a fertile environment for SLA to occur. According to Gass (1997, p. 131), "negotiation is a means of drawing attention to linguistic form, making it salient and thereby creating a readiness for learning."

Actually proving that the negotiation of meaning also promotes the restructuring of the learner's linguistic system is a far more elusive proposition, not only for the proponents of the Interaction Hypothesis, but for all theories of SLA as well. Output, especially delayed and linguistically productive output, certainly constitutes strong evidence, but not necessarily conclusive proof, that the learner's internal system has, in fact, been restructured. Tracing output back to a single recorded learning moment would seem exceedingly difficult for any SLA theory. Notwithstanding these research obstacles, the study of what learners do with their miscommunications has brought to light many interesting observations concerning the SLA process. The present study offers additional observations within this interactionist framework by presenting data from computer mediated communication (CMC) among L2 learners of Spanish.

As briefly mentioned above, the benefits of negotiations of meaning were first demonstrated for learner/native speaker oral exchanges (Hatch, 1978; Holliday, 1995; Long, 1981), but further investigations have shown that these benefits hold true for learner/learner oral discussions as well (Gass & Varonis, 1994). Within the context of the Interaction Hypothesis, then, the goals of this study were threefold: (a) to document that networked learner/learner discussions in Spanish would also produce language modifications such as those reported in the oral-based interactionist literature; (b) to characterize linguistically those modifications; and (c) to test whether Pica, Kanagy, and Falodun's predictions concerning the superiority of jigsaw and information-gap tasks also held for students involved in CMC. While it might seem obvious to some that L2 learners will negotiate meaning if engaged by the appropriate tasks, few studies have documented how students do this on-line (for one notable exception, see Pellettieri, 1999). Above all, this study seeks to show how chat programs can provide the SLA field with a convenient window through which to observe L2 interlanguage as it is unfolding.

TOOLS FOR COMPUTER MEDIATED COMMUNICATION

To address these three goals, 50 students from two intermediate Spanish classes at UC Davis were asked to chat in pairs for one hour a week in the language lab using a synchronous chat program, [Remote Technical Assistance](#) (RTA), developed at UC Davis. RTA tool differs from other chat programs such as *Daedalus Interchange*, *IRC*, or *WebCT* chat in the following ways:

- RTA allows users to [record and forward digitized sound](#) ^{*NOTE*} on the fly.
- Students can share text in two ways: through a [chat window](#) that supports random exchanges and through a collaborative writing window or "[Textpad](#)" [Window](#) that requires the participants to follow a turn-taking protocol.
- Students can create [shared whiteboards](#) using either screen capture or blank, white backgrounds.
- This chat program also lets each user [remotely manipulate his or her partner's Web browser](#).
- Finally, RTA permits both point-to-point and multipoint/group chat, whereas other chat programs often only facilitate one or the other mode.

Most importantly, the RTA chat program records all written interactions entered in both a chat window and the collaborative writing window (Textpad), which provide researchers with an instantaneous transcript of all user exchanges that can be conveniently retrieved from a [Web-based management page](#). Fortunately, for the purposes of research, telling students that their responses would be logged by the computer for further examination did not seem to diminish their level of participation or their sense that the computer afforded them a relatively anonymous, or at least protected, environment for their discussions, as evidenced by the confidential nature of some of their exchanges with their partners.

While these special RTA features were fully employed in order to deliver and facilitate the students' on-line completion of the tasks, the experiments described below could also have been carried out by any other chat programs that supports pair work, if supplemented by written instructions, illustrations, and pre-recorded materials. Demonstrating the superiority of RTA vis-à-vis other chat programs was not the focus of this study. Rather, this study assumed certain advantages common to all computer mediated communication (CMC) over face-to-face oral exchanges that have already been reported in the literature, namely, that computer mediated communication constitutes (a) a text-based medium that amplifies students' attention to linguistic form (Warschauer, 1997), (b) a stimulus for increased written L2 production (Kern, 1995), (c) a less stressful environment for L2 practice (Chun, 1998), and (d) a more equitable and non-threatening forum for L2 discussions, especially those involving women, minorities, and naturally reserved personalities (Warschauer, 1996, 1997). Swaffar (1998, p. 1) has succinctly summarized the benefits derived from CMC as compared to oral exchanges in the L2 classroom:

"Networked exchanges seem to help all individuals in language classes engage more frequently, with greater confidence, and with greater enthusiasm in the communicative process than is characteristic for similar students in oral classrooms."

TWO EXPERIMENTS

All 50 students asked to chat in Spanish were native speakers of English enrolled in university-level intermediate Spanish courses during the 1998 Spring and Fall quarters. Students were given an hour-long training session on how to use RTA for synchronous chatting at a distance before attempting the tasks described below. Next, working in dyads in different locations throughout the lab, the students attempted to solve a series of tasks that required cooperation with their assigned partner to complete successfully. The instructors were not part of any of these networked discussions. Each task asked the pairs to use the chat window to solve the task and then summarize their results in a more formal way (i.e., write a report) using the Textpad window. While the RTA chat window promotes more colloquial, if not oral-like exchanges, the Textpad window--where only one person can have control of the cursor or stylus at any one time--produces much more formal and accurate prose, like that of take-home writing assignments.

The primary focus of this study was to analyze the discourse produced in the chat window, including any chat-window discussions that took place in response to finishing the Textpad summary. Testing whether or not the more expanded array of RTA options (i.e., sound, shared whiteboards, remote URL manipulation) might have a significant effect on language learning vis-à-vis other chat programs remains a questions for future investigation.

The tasks themselves were modeled after Pica, Kanagy, and Falodun's (1993) typology, which distinguishes whether the tasks are one-way or two-way exchanges of information, whether only one or both members of the pair have access to all the pertinent facts needed to find a solution, whether there exists a unique solution or multiple solutions and, finally, whether the task require that the participants reach some sort of agreement or convergence. As mentioned earlier, Pica et al. singled out jigsaw and two-way information-gap tasks as being particularly favorable for stimulating negotiations of meaning. With jigsaw tasks, the participants possess different pieces of the puzzle needed for a solution and, therefore, must work collaboratively to converge on a single outcome. With information gap tasks, the participants must affect an exchange of information, either one-way or two-way. With decision-making tasks, the participants have equal access to all relevant facts but are *not necessarily* forced to converge on any common solution. Pica et al. also predicted that tasks with a convergence requirement were, in general, superior for promoting interactions. This study sought to validate their findings for CMC exchanges among non-native speakers (NNS).

The tasks for the 1998 Spring and Fall quarters are given in (1) and (2) below. The four tasks from Spring Quarter were modified slightly and expanded for Fall quarter based on the results from the first group of 25 students. In essence, more information-gap tasks were added for the fall and the "Drawings" comparison task was replaced by a "Password Game" task in hopes of stimulating more negotiations. In addition, the tasks for Fall '98 also included developing a profile of a Spanish heritage speaker (NS) who connected to the RTA network from another building at the same time as the L2 students. This task was added in response to the students' frequent requests for more contact with native speakers as registered in the Spring '98 post-test usage questionnaires.

All students were assigned different partners for each new task in order to heighten the collaborative nature of their conversations and to avoid any student collusion that might work against the spirit of the negotiations. All tasks were carried out within the constraints of one 50-minute classroom period.

(1) Tasks for Spring '98

- a. [NNS Profile](#) (1-way information gap task): Develop a personality profile of your partner; summarize the profile in writing by working together and using the collaborative writing tool, TEXTPAD.
- b. Drawings [A](#) and [B](#) (jigsaw of the "Odd man out" type): Identify the drawing that doesn't fit in 3 groups of 4, where each partner can see only 2 of 4 drawings. Then develop a rationale for these choices and summarize them in writing using TEXTPAD.
- c. [Calendar](#) (jigsaw task): Share the activities from two different personal calendars: Antonio Banderas and Madonna. Identify the events done in common by the two people. Then develop a story written in the past about those common activities.
- d. [Apartment](#) (jigsaw task): Find an apartment in Madrid by sharing different sets of Web ads and radically different personal preferences (see URL) for the ideal living conditions, as given by the instructor. Summarize the results using TEXTPAD.

(2) Tasks for Fall '98

- a. [NNS Profile](#) (1-way information gap task): Develop a personality profile of your partner. Summarize the profile in writing using the collaborative writing tool, TEXTPAD.
- b. [NS Profile](#) (1-way information gap task): Partners will connect to a group chat with some unknown native speaker (NS) located in another building. The dyad must find out who the

- mystery NS person is, develop a personality profile of this person, and summarize the profile in writing using the collaborative writing tool, TEXTPAD.
- c. [Password game](#) (2-way information gap task): Guess the object or concept that your partner describes (or gives synonyms for), then switch roles. Each person has a set of three words. Develop a rationale for these choices and summarize them in writing using TEXTPAD. (List of possible words: *sadness, conflict, absence, history, dialogue, democracy, translation, success, and wound.*)
 - d. [Mystery Object](#) (Decision-making task): Based on written, sound, and image clues given by the instructor, guess the identity of the mystery object, then write up the results using TEXTPAD. Each student has access to the same task stimuli.
 - e. [Calendar](#) (jigsaw task): Share the activities from two different personal calendars: Antonio Banderas and Madonna. Identify the events done in common by the two people. Then develop a story written in the past about those common activities using TEXTPAD.
 - f. [Apartment](#) (jigsaw task): Find an apartment in Madrid by sharing different sets of Web ads and radically different personal preferences (see URL) for the ideal living conditions. Summarize the results using TEXTPAD. Each partner has a different set of goals that s/he must negotiate with the partner and, if necessary, reach a compromise.

Regardless of the task type, the negotiations that arose in these networked exchanges tended to follow Varonis and Gass' (1985) typical schema, illustrated in (3): trigger, indicator, response, reaction. In other words, the first use of the linguistic item(s) in question becomes the "trigger" for the negotiation event. The partner experiencing a communication problem indicates that fact with an appropriate phrase, such as, "I don't understand X," or, more simply, "what's X?" The other partner then attempts an explanation or "response" in an effort to clarify the misunderstanding. If the negotiation is successful, the partner who indicated the non—understanding in the first place brings closure to the negotiation event by acknowledging the help given, usually by means of a stock phrase such as "yes, thanks" or "I see" or "now that's clear." Notice in (3) that the response, which is an explicit correction in this case, is articulated completely in Spanish, albeit with some nontarget-like expressions typical of the students' interlanguage at this level. In other words, their utterances are neither all wrong nor all right but somewhere in between, as the concept of interlanguage itself suggests. The student exchanges have been translated literally into English in order to approximate the level and quality of their interlanguage. Their linguistic errors are not discrete in nature, but involve complex misuses and omissions of structures from the target language, as well as pragmatic and cultural confusions. Often times a native Spanish speaker would have used completely different structures than the one employed by the L2 learners. Calculating what is right or wrong is not a straightforward proposition when dealing with interlanguage.

(3) Lexical negotiation with an explicit correction (Drawings task, Spring '98)

X: Cuales son en común ? [What are in common?]	[TRIGGER]
Y: como se dice comun en igles? no comprehede [How do you say "common" in English?... no understand]	[INDICATOR]
X: común es cuando algo y una otra algo son el mismo; entiendes mi explicacion? ["Common" is when something and another thing are the same; do you	[RESPONSE]

understand my explanation?]

Y: si, gracias...
[Yes, thank you.]

[REACTION]

Some negotiations, of course, were considerably shorter than the schema shown in (3), being composed of more pointed speech routines such as "What's X?" followed by a retort such as "X is Y." Others negotiations, such as (4) below, required extended probing and negotiation between partners to resolve the initial misunderstanding.

X: describame su primer dibujo y
despues yo describo a tu mi primer
dibujo
[Describe for me your first picture and
then I will describe to you [nominative
case] my first picture.]

Y: ellos estan a una **sepultura**.
[They are at a tomb.]

[TRIGGER]

X: que es **sepultura**?
[What's a "tomb"?)

[INDICATOR]

Y: **cementario**
[a cementary]

[RESPONSE]

X: tu estas usando el diccionario?
[You are using the dictionary?]

Y: si
[yes.]

X: puse
[I put.]

Y: para la gente muerto
[for the dead people.]

[RESPONSE]/ [TRIGGER]

X: ...no puse un diccionario
[I didn't put a dictionary.]

X: una esta muerto?
[one is dead?]

[INDICATOR]

Y: tu sabes
[you know.]

X: no
[no.]

X: No se.
[I don't know.]

X: hola, describama mas
[hello, describe for me more]

- Y: donde tu puso gente muerto
[where you puts [sic] dead people.] [RESPONSE]
- Y: y visitas tu familia muertos
[and you visit your dead family.] [RESPONSE]
- X: oooo, el lugar donde los muertos ir
cuando estan muertos....en latierra?
[Ooooh. The place where the dead to go
when they are dead . . . in the earth?] [REACTION]
- Y: si pero en un cementario
[Yes, but in a cementary.] [RESPONSE]
- X: si entiendo
[Yes, I understand] [REACTION]

(4) Request for lexical assistance (Calendar task, Fall '98)

THE RESULTS

Looking at the transcripts in a purely quantitative light, Tables 1 and 2 illustrate just how task-sensitive these incidental negotiations can be. To begin with, the total number of negotiations comprises only a small fraction of the overall conversational turns, ranging from 0.3% to 3.8%. This result is not unexpected since these conversations are driven by the need to exchange information, and the incidental moments that focus on form are tangential to the main line of discourse (i.e., the task). Jigsaw tasks account for 93% and 78% of the total negotiations for the spring and fall, respectively, with task #6 (Apartment task) stimulating the most negotiations from students in both quarters. A chi-square test comparing jigsaw tasks with all other task types proved highly significant (all $p < .001$), although the effect size as measured by a phi coefficient was only .067 and .102 for the fall and spring, respectively. These results appear to corroborate Pica et al.'s finding for jigsaw tasks, but not for information-gap tasks.

Table 1. Total Number of Negotiations for Spring '98 Study

Task	Task Type	Total Turns	Negotiations	Negotiations/ Turns
1. NNS Profile	Info gap (1-way)	769	2	0.3 %
2. Drawings	Jigsaw	817	16	1.9 %
3. Calendar	Jigsaw	1064	21	2.0 %
4. Apartment	Jigsaw	929	36	3.8 %

Table 2. Total Number of Negotiation for Fall '98 Study

Task	Task Type	Total Turns	Negotiations	Negotiations/ Turns
1. NNS-	Info gap	544	7	1.2%

Profile	(1-way)			
2. NS-Profile	Info gap (1-way)	1,348	4	0.3%
3. Password	Info gap (2-way)	1,154	5	0.4%
4. Mystery Obj.	Decision-making	354	6	1.7%
5. Calendar	Jigsaw	504	15	3.0%
6. Apartment	Jigsaw	1,013	35	3.5%

The Apartment jigsaw task was the most productive for several reasons. First, the students had to maintain loyalty throughout the entire task to their assigned personalities (the Oscar/Feliz "odd-couple" phenomenon), which helped animate their exchanges. Second, the apartment ads themselves contained many abbreviations in Spanish which motivated frequent clarifications (e.g., *wc* = bathroom, *c/* = *calle* [street], *c/c* = *calefacción central* [central heat], *ext.* = *exterior* [exterior], *port. físico* = *portero físico* [doorman on duty]). And, finally, the chat session could only be terminated when the pair successfully chose 1 apartment from the 8 listings (four for each partner). In other words, failure was not an option and any miscommunications had to be resolved, if the pair had any realistic hope of moving toward a final solution.

In [Table 2](#), it should also be noticed that task #2 from the Fall quarter, the "native-speaker profile," generated the most exchanges, but triggered few negotiations. This was the only pairing of an L2 learner with a native speakers in these two experiments. For task #2, each intermediate Spanish learner used a computer in the language lab to connect to an unknown heritage speaker located in a different building on campus at a pre-arranged time outside of class. The L2 learners enjoyed this experience immensely. In fact, the Spring group from the quarter before had strongly suggested that future networked exchanges should include native speakers. Without a doubt, the presence of heritage speakers increased the overall glibness in Spanish for these pairs, possibly because the heritage speaker constantly tried to keep the conversation moving along. But the mere protocol imposed by an interview tends to encourage polite listening for content as opposed to expressing concerns about linguistic forms or accuracy. In terms of power and authority, the learner/native speaker pairing was unequal, since the native speakers were much more in control of the conversation. This fact could have increased the fear of embarrassment for the L2 learner and acted as a damper to noticing and repairing any miscommunications. I will leave for a further study what interactions between L2 learners and native speakers look like when they are assigned a more challenging jigsaw task, such as #6.²

From the linguistic viewpoint, lexical confusions triggered the overwhelming majority of negotiation: 75% and 95% of all negotiations were lexical for the Spring and Fall groups, respectively. In the post-test attitude surveys, one student (Fall '98) clearly articulated his new awareness of the importance of these lexical negotiations by observing "It gave me a wake-up call that vocabulary means everything." Whether this finding would obtain for other non-Romance target languages that exhibit more syntactic complexity (e.g., Japanese) remains an interesting question for further research.

Nevertheless, other miscommunications due to phonology, morphology, and syntax did crop up, but these were few and far between. In [\(5\)](#) the correct response for the password game is *salida* [exit]. Speaker Y

guesses the answer by typing *exito* without an accent where he or she should have put *salida* [exit]. Speaker X explicitly reminds speaker Y that phonemic stress in Spanish can be important, despite the fact that their networked exchanges are text-based. In this case, speaker X points out that *éxito* [ék-si-to] with an accent is a correct Spanish word, but it means "success" not "exit" as speaker Y had intended. Speaker Y acknowledges that [ek'-sí-to] with an accent means "success," and then the dyad continues working toward the correct answer, *salida*.

(5) Pronunciation negotiation: (Password task, Fall '98)

X: cuando hay un fuego, nos vamos . . . [when there is a fire, we go . . .]	
Y: alli [there]	
Y: a un exito [to an exit]	[TRIGGER]
X: perdon, la palabra no es <u>exito</u> [excuse me, the word is not <u>exíto</u>]	[INDICATIVE]
X: es <u>ex' ito</u> [it's <u>éxito</u>]	[RESPONSE]
X: son diferentes, pero los mismos [they are different, but the same]	[RESPONSE]
Y: success ['success']	[RESPONSE]
X: si [yes]	[REACTION]

Morphological confusions, too, served as an occasional point of departure for an exchange which focuses on form, as shown by the direct question on gender marking in (6). The pair is trying to write up their report on the Spring '98 Drawing task (2) by using Textpad, the collaborative writing tool. They switch back to the chat window to resolve a gender confusion which needs to be correctly written in their report. Both (6) and (7) below are not, strictly speaking, examples of negotiation of meaning in the classical sense, since there is no *incidental* communicative misunderstanding, but rather a direct attempt to resolve a linguistic question, albeit extremely relevant to finishing the task at hand (i.e., the written report).

(6) Grammar negotiation: gender marking (Drawing task, Spring '98)

X: <u>la o el país</u> ? ["la" or "el" country]
Y: <u>país</u> es masculino ["Country" is masculine.]
X: sí? [Yeah?]
Y: ok [Ok.]

Example (7) presents another direct grammatical question similar to the one in (6). Here the pair tries to clarify the Spanish aspectual distinctions in the past: the preterite versus the imperfect. Speaker Y first states that the verb should be in the preterite *fue* because the action occurs in the past, a thoroughly unhelpful comment, since both the imperfect *era* and the preterite *fue* encode past events and are mapped to only one translation in English, "was." Then speaker Y differentiates repeated or habitual events from discrete, punctual past actions--a reasonably good account of the aspectual contrasts in question. This explanation proved comprehensible and effective for speaker X, and the pair then returned to the more central task imposed by writing up their report.

(7) Grammar negotiation: verbal aspect (Calendar task, Spring '98)

X: pero, usamos **era** o **fue**?
 [But, do we use era ("was" the imperfect)
 or fue ("was" the preterite)?]

X: **Fue** un día llena
 [It was (the preterite) a full day.]

Y: creo que **fue** porque todo ocurre en el
 pasado
 [I think fue (the preterite) because it all
 occurs in the past.]

Y: y **fue** un día y no un serie de días
 [And it was (the preterite) one day and not
 a series of days.]

X: esta bien, ok?
 [All right?]

Y: sí
 [Yes.]

POST-TEST STUDENT ATTITUDES AND REFLECTIONS

All participants were asked to fill out a post-test attitude survey which gathered opinions about the pros and cons of synchronic chatting using the RTA tool. The most common student response (51 comments) fell into one or more of the following three areas: their RTA experience was fun, helpful, and/or conducive to improving their communication skills in Spanish, as illustrated by (8), a sample of their most frequent comments. A few students seemed to suggest that the computer mediated communication (CMC) medium might even be superior at times to the oral discussions that occur (or, unfortunately, do not occur) in the language classroom.

(8) Common Responses from the Post-Test Attitude Survey:

- RTA definitely made me feel more comfortable using Spanish. Since we were not allowed to use English as a crutch, we had to figure out how to communicate with each other. I've never really had the opportunity to do that before this program. (Spring '98)
- The RTA experience was fun and helpful. It made you think quickly and keep communicating. It took the place of having conversations with a partner in class, which I think is better because most people don't seem to converse very long or enthusiastically in class. (Spring '98)
- Being able to communicate with a fellow student was very useful as a learning process, as we were able to help each other. Chat and Sound created two good sources of communication. Chat,

Sound, and Textpad were key as they enabled us to work together on the same paper or "text". . . We were able to help each other with problems or try to figure out a problem together. (Fall '98) Two students were able to reflect on the underlying interactionist framework and the advantages of jigsaw tasks, as shown in (9). These comments underscore the importance of negative evidence as a stimulus for continued development toward the target language, at least with respect to lexical development.

(9) Unusual Comments from the Post-Test Attitude Survey:

- You learn by correcting yourself and your partner's mistakes. Therefore, a good method but actually it is not obvious right now. (Fall '98)
- I feel that having to compromise and working blindly, meaning not everybody had the same information [i.e., jigsaw tasks], I was forced to exercise writing/communication skills--which was helpful. (Fall '98)

When specifically asked what were the weaknesses of the RTA program, about half of the students said they were completely satisfied with their experience. The complaints that did surface varied widely and dealt with system failures or program glitches, the difficulty of adding Spanish accents, the lack of time to complete the tasks, uneven levels of task difficulty, or their own lack of sufficient computer experience.

FINDINGS AND DISCUSSION

1. These two experiments support the following four findings:
2. Well-designed networked tasks promote learners to notice the gaps in their lexical interlanguage in a manner similar to what has been reported in the literature for oral learner/learner discussions.
3. Jigsaw tasks prove superior to other types of tasks (e.g., information gap, decision-making, opinion tasks) as a stimulus for the students' Focus on Form as Pica et al. had predicted, but the same cannot be said of information gap tasks.
4. Networked exchanges, since they are text-based and learners must type out or produce the structures in question, appear to constitute an example of forced output (Swain, 1985), which some researchers have identified as a crucially important factor in the promotion of a fertile learning environment for SLA. Networked exchanges especially stimulated learners' metatalk or reflections on their own vocabulary use (Swain, 1998, p. 68).
5. Lexical confusions make up the most common form of negotiation in these learner/learner networked exchanges.

Although finding (1) may appear at first blush rather obvious or even trivial in that learners are bound to focus on form in the due course of carrying out well-designed collaborative tasks, this study demonstrates that CMC produces similar benefits to those of oral discussions *without the temporal and spatial constraints imposed by the classroom*. The practical implications of this finding, however, are not insignificant. If one puts aside phonetic accuracy and oral practice for the moment and concentrates on written modalities alone, this finding suggests that a CMC learning environment could provide many of the alleged benefits ascribed to the Interaction Hypothesis, but with greatly increased possibilities for access outside of the classroom. If negotiations are important for the SLA process (i.e., the Interaction Hypothesis), then networked negotiations provide a medium for this fruitful activity to occur not only more frequently but also at any time of the day or night. Increased opportunities to engage in collaborative tasks online could provide a significant benefit in light of the arduous journey L2 learners must make toward the target language and the important role that input plays in this process. Providing students with increased opportunities to engage in negotiations, in the sense defined above, could direct language teachers to accord CMC a more expanded role in the L2 curriculum.

By the same token, future research needs to compare and contrast synchronic learner/learner exchanges, such as those reported in this study, with asynchronous discussions so commonly employed in today's

foreign-language classroom in the form of e-mail and bulletin boards. It is important to determine if negotiations of meaning occur with the same frequency in an asynchronous setting with jigsaw-type tasks.

Finding (4)--that lexical negotiations predominate these learner/learner exchanges--should not come as any surprise either. An intermediate L2 learner has typically logged only 200 hours of instruction in the target language and simply doesn't have a solid syntactic base with which to help or correct peers. Vocabulary knowledge, however, can be more straightforwardly developed. In fact, certain methodologies such as the *Natural Approach* concentrate more on lexical growth than grammatical accuracy. Vocabulary breakdowns constitute the most obvious barrier to learner/learner discussions, especially on the Internet where no body language clues are available to support the speaker's meaning.

Nevertheless, the Focus on Form approach still leaves certain questions either unanswered or unsatisfactorily addressed: in particular, the issue of grammatical development. While the positive impact of negotiations on vocabulary development seems fairly obvious from the examples presented here and elsewhere in the literature, it is not at all clear that *incidental* negotiations will ever suffice for supplying all the types of evidence needed to come to grips with the many syntactic difficulties still plaguing the intermediate learner's grammar. This present study yielded only a handful of grammatical negotiations and many of them did not constitute negotiations of meaning in the classical sense, but rather direct questions about linguistic forms. Few interactionist studies have demonstrated that incidental negotiations within a task-based approach might stimulate a comprehensive development of the learners' morphological and syntactic problems on a larger scale (for exceptions, see Loschky & Bley-Vroman, 1993; Mackey, 1999; Swain, 1998). More attention must be directed to this end, if the Interactionist Hypothesis is to be considered a principal stimulus for students' internal syntactic restructuring, which is at the very heart of the SLA question.

On a related topic, classroom practitioners frequently worry that learner/learner discussions will propagate and reinforce nontarget-like language, in other words, the blind leading the blind. Kern (1995, p. 470) has adequately characterized this problem with large-group networked exchanges in an intermediate French class using *Daedalus Interchange*: "Grammatical accuracy suffers [with CMC] and consequently learners read 'defective' French." These fears certainly warrant close attention, but they were not borne out by an examination of this study's transcripts of 50 students. No incorrect forms were explicitly passed on from one to the other in their incidental negotiations in the present experiments. Porter's findings (1986, p. 219) also seem to indicate that "such miscorrections and error incorporations were extremely rare in the data." Nevertheless, this issue needs to be rigorously monitored and reexamined as more data comes in. Again, additional data from networked discussions via Chat programs that make the data collection relatively easy, such as RTA, should allow us to determine the frequency of student/student miscorrections. Swain's recent study (1998, pp. 77-79) offers some new data on this question: Of the total negotiations tallied in her study, only 8.2% involved the transmission of incorrect solutions. She found in her post-tests, however, that students tended to remember these incorrect solutions and reproduced them on subsequent tests.

CONCLUSIONS

SLA research conducted with chat programs with log-keeping capabilities, such as RTA, document much more than the type of student satisfaction reflected in the sample comments given above in (8) and (9). They provide a window that lets us track the painfully slow development of interlanguage, an evolution which proceeds most overtly at the lexical level, one word and/or meaning at a time. The complete chat records from these two RTA experiments provide convincing evidence that carefully crafted tasks stimulate L2 learners to negotiate meaning which, in turn, seems to affect their output. By all accounts, jigsaw tasks provide the greatest inducement for negotiations, perhaps because they require each partner to both request and contribute parts of the solution, exacting from L2 learners a certain level of cooperation, convergence, and a pooling of resources. These tasks appear to constitute ideal conditions

for SLA, with the CMC medium being no exception. In the process, L2 learners heighten their metalinguistic awareness of where they are in their own L2 vocabulary development and where they still need to go in order to gain more targetlike lexical control. Doing tasks in a CMC environment, then, generates apperceived input, which can subsequently be used to modify and improve their vocabulary.

Clearly, the interactionist model has opened up many productive avenues for SLA research. This study shows that the records provided by networked exchanges can be of great service to this line of investigation.

NOTES

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2. The native speakers in this study were all enrolled in a special course designed for heritage Spanish speakers. This adds a further complication in that these speakers have strong oral knowledge of Spanish but underdeveloped or non-academic Spanish written skills.

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