

## AN EXPERIMENTAL STUDY OF CORRECTIVE FEEDBACK DURING VIDEO-CONFERENCING

**Kátia Monteiro**

This study investigated the effectiveness of oral metalinguistic feedback and recasts as well as the effect of focused tasks (FT) in the development of implicit and explicit knowledge during video-conference interactions. This was accomplished by partial replication of a study performed in a classroom setting. Three groups of Brazilian EFL learners ( $n = 42$ ) participated in a pre-test, post-test, and delayed post-test targeting the regular simple past. The final results indicated that all the groups developed implicit and explicit knowledge of the target structure over time, with no differences across groups. This study also discusses the challenges of experimental research in video-conferencing, and suggests some strategies on how this particular area of research can be improved.

**Key words:** Corrective Feedback, Metalinguistic Feedback, Recasts, Video-Conferencing Interactions, Computer-Mediated Communication (CMC)

**APA Citation:** Monteiro, K. (2014). An experimental study of corrective feedback during video-conferencing. *Language Learning & Technology*, 18(3), 56–79. Retrieved from <http://llt.msu.edu/issues/october2014/monteiro.pdf>

**Received:** February 8, 2013 **Accepted:** August 16, 2013; **Published:** October 1, 2014

**Copyright:** © Kátia Monteiro

### INTRODUCTION

Corrective feedback is considered by many scholars to be an important facilitative strategy in second language acquisition (SLA). Several studies have provided strong evidence of its importance in the process of language development (see meta-analyses by Li, 2010; Mackey & Goo, 2007; Russell & Spada, 2006; and review of the literature by Lyster, Saito & Sato, 2013; Mackey, 2007; Sheen, 2010; Spada, 1997); however, most of the studies conducted so far have focused on feedback in traditional face-to-face classes or in laboratory settings, whereas this tool remains under-investigated in computer-mediated communication (CMC) environments (Li, 2010).

Within the research of computer assisted language learning (CALL), some studies have been developed in order to assess the benefits of corrective feedback in written synchronous computer-mediated (e.g., Lai & Zhao, 2006; Loewen & Erlam, 2006) and computer-delivered environments (e.g., Nagata, 1993; Sagarra, 2007); however, few studies have investigated this construct in oral and video synchronous computer-mediated communication. This number is even lower in relation to experimental research (Yanguas, 2010). The current study was aimed at filling this gap by investigating the effectiveness of metalinguistic feedback, recasts, and focused tasks in video-conferencing by partially replicating R. Ellis, Loewen, and Erlam (2006), who tested the effectiveness of those two corrective feedback types in traditional face-to-face classes in the development of implicit and explicit knowledge.

### LITERATURE REVIEW

#### The Interaction Hypothesis and Feedback

Long (1996) proposed in his interaction hypothesis that during interactions important factors such as input, output, “learner’s developing L2 [second language] processing capacity,” (p. 414) and corrective feedback are put together in order to facilitate language acquisition. The idea behind this hypothesis is that in

an effort to communicate, learners and competent speakers provide and interpret signals of their own and their interlocutor's perceived comprehension, thus provoking adjustments to linguistic form, conversational structure, message content, or all three, until an acceptable level of understanding is achieved (p. 418).

Corrective feedback, a more competent speaker's reaction to learners' ill-formed output (Panova & Lyster, 2002), has been one of the most studied interactional strategies for the acquisition of forms during negotiation of meaning. Although there exists a variety of feedback types, due to space constraints this literature review revisits only the experimental studies developed so far concerning the effectiveness of the two feedback moves related to the current study (i.e., recasts and metalinguistic feedback) in oral conversational contexts and in CALL environments. This literature also includes a brief discussion of another variable under investigation here: the effect of feedback in the development of implicit and explicit knowledge.

### **Studies on Oral Recasts and Metalinguistic Feedback**

Long (2007) defined corrective recast "as a reformulation of all or part of a learner's immediately preceding utterance" (p. 77). It is said to provide negative evidence (i.e., an indication that an error was committed) and positive evidence (i.e., a model for learners to follow) at the same time (Leeman, 2003; Sanz & Morgan-Short, 2004). Recasts are overall regarded as an implicit feedback type, but they can be quite explicit in dyadic interaction when they are intensive and individualized (Lyster & Izquierdo, 2009). In addition, recasts are the most frequent feedback move in classrooms (Lyster & Mori, 2006; Lyster & Ranta, 1997; Panova & Lyster, 2002). Finally, they are categorized as a "provide" feedback type (see feedback categorization by Loewen & Nabei, 2007), because instead of prompting learners to correct their sentences on their own, the interlocutor gives the correct form(s) to the learners.

Metalinguistic feedback takes the form of metalinguistic information about the error committed without the correct form; therefore, it is regarded as a "prompt": a feedback move that induces learners to repair the incorrect forms on their own (Loewen & Nabei, 2007). In addition, metalinguistic feedback provides negative evidence and is often regarded as explicit (Lyster & Ranta, 1997).

The experimental research developed to assess feedback effectiveness increased rapidly in the past two decades and initiated a debate about which feedback type is more effective for error correction. Most of this research involved the comparison of recasts against prompts, and were performed mostly in two distinct environments: classrooms and laboratories. Classroom-based studies commonly involve group interactions; therefore, feedback delivery is usually not intensive, since not all non-target like utterances are corrected by the researcher or teacher. In laboratory-based studies, interactions are usually dyadic and feedback is intensive and controlled. Due to the different characteristics of both environments, feedback has been reported to have differential effects in each of them.

In laboratory settings, recasts and prompts have been shown to be equally effective (Loewen & Nabei, 2007; Lyster & Izquierdo, 2009), although there is also evidence suggesting that metalinguistic feedback might have an advantage (Carroll & Swain, 1993; Varnosfadrani & Basturkmen, 2009) and that recasts might be more effective for novel structures or structures developed at a later developmental stage (Long, Inagaki, & Ortega, 1998; Varnosfadrani & Basturkmen, 2009). When compared to models and not to other feedback types, recasts were shown to be more effective (Long et al., 1998), including when compared to groups receiving no feedback (Han, 2002). Metalinguistic feedback was also demonstrated to be more effective when compared exclusively to the absence of feedback (Lin & Hedgcock, 1996).

In classroom settings, metalinguistic feedback (sometimes operationalized together with other prompts) was demonstrated to be more effective than recasts (Ammar, 2008; Ammar & Spada, 2006; Dilans, 2010; R. Ellis, 2007; R. Ellis et al., 2006; Lyster, 2004; Sheen, 2007). However, there is also some evidence suggesting no differences among those two feedback moves (Loewen & Philp, 2006; McDonough, 2007).

In addition, McDonough (2007) suggested that prompts might help learners transfer the knowledge from a target structure to new structures; although Yang and Lyster (2010) suggested that the advantage for prompts is related only to rule-based forms and not to item-based forms, for which recasts and prompts are equally effective. When compared to groups not receiving feedback, recast groups were demonstrated to have an advantage, at least for the acquisition of phonological knowledge (Saito & Lyster, 2011; 2012).

Recent meta-analyses confirm that in laboratory settings different feedback types tend to be equally effective, while in classrooms, prompts tend to have an advantage. Mackey and Goo (2007) and Li (2010) found high effect sizes for all feedback types in lab-based studies, indicating that during dyadic interaction, any type of corrective feedback move is effective. Lyster and Saito (2010) found in their meta-analysis of classroom-based studies that prompts (including metalinguistic feedback) were statistically more effective than recasts.

The overall advantage of prompts in classrooms might be explained by the fact that in this environment there are more interruptions and feedback is less intensive than in laboratory settings; therefore, there is an advantage for the corrective feedback that is more explicit and output-pushing, as argued by R. Ellis (2007) and Sheen (2007). In laboratory-based studies, different feedback types tend to be equally effective due to the intensiveness of feedback delivery, which makes them more noticeable (Lyster & Izquierdo, 2009).

### **Synchronous CALL Studies and Corrective Feedback**

Corrective feedback effectiveness has also been the focus of some studies on CALL. However, most of the research studies on synchronous environments (e.g., video-conferencing, text-chat) involved written interactions exclusively, with no clear evidence of which feedback type is more effective. Some studies on written computer-mediated interactions (i.e., people communicating through the computer) and on computer-delivered interactions found no differences in effectiveness among different feedback moves (Sanz & Morgan-Short, 2004; Sauro, 2009), while others did not find significant differences in the use of recasts and metalinguistic feedback (Loewen & Erlam, 2006). Studies focusing exclusively on recasts compared to the absence of feedback pointed to the effectiveness of recasts (Sagarra, 2007; Trofimovich, Ammar, & Gatbonton, 2007), but not when they were compared to explicit correction (Yilmaz, 2012). Sachs and Suh (2007) found no differences between enhanced and non-enhanced written synchronous recasts, while Heift (2004) found an advantage for written computer-delivered metalinguistic feedback (with or without highlighting) over repetition with highlighting.

The few studies on oral and video CMC (i.e., video-conferencing) developed so far are mostly qualitative and observational, with no treatment administered (e.g., Develotte, Guichon, & Vincent, 2010; Lee, 2007). The only studies that have investigated video-conferencing quantitatively through the perspective of the interactionist approach, were Guichon, Bétrancourt, and Prié (2012), Wang (2006), and Yanguas (2010). Those studies, however, were exploratory (i.e., there was no treatment) and were not aimed at investigating feedback effectiveness; therefore, the current study fills this research gap.

It is worth mentioning that although video-conferencing borrows many characteristics of traditional face-to-face communication, it has distinctive interactional characteristics. The most important difference is that during video-conferencing interactions, oral and body language can be used together with a variety of other modalities (e.g., text-chat, pictures, and videos) which enable interlocutors to manipulate how and when to communicate, changing the way they create meaning (Hampel & Stickler, 2012). Develotte et al. (2010) suggested that learners' lack of knowledge of the technologies used in video-conferencing interactions might increase the cognitive load of the tasks, and possible technological problems interrupt the communication flow. Wang (2006) proposed that despite the demands from the technologies (e.g., knowledge of how to manipulate a video-chat program in a computer, of how to switch programs to access different resources), the use of multimodalities can promote more interaction. Wang also argues that video-conferencing has a one-on-one nature, enhancing the potentials for negotiation of meaning,

pushed output, and focus-on-form. Goodfellow, Jefferys, Miles, and Shirra (1996) also argue that in computer-mediated face-to-face interactions, contributions are more frequently required. As a result it changes the nature of “eliciting techniques and turn-taking” (p. 14). Therefore, it is worth investigating if in such environment with new demands and challenges (e.g., technological problems), but with more opportunities for interaction and more access to multiple modalities, corrective feedback and focused tasks have differential effects compared to classroom and laboratory studies.

### **Implicit and Explicit Knowledge**

As a partial replication of R. Ellis et al. (2006), the current study was aimed at investigating the effect of corrective feedback in the development of implicit and explicit knowledge. R. Ellis (2005) and N.C. Ellis (1994) define implicit knowledge as intuitive and automated, usually acquired through a natural process without conscious effort. R. Ellis (2005) defines explicit knowledge primarily as analyzed knowledge, the one “of which learners are consciously aware” (p. 151), which is often regarded as inconsistent and is acquired through conscious operations either incidentally or through instruction (N.C. Ellis, 1994).

Some studies investigated the impact of corrective feedback on the development of both knowledge types. Loewen and Erlam (2006) found no effect for feedback over time neither for implicit nor for explicit knowledge during online chat, but Loewen and Nabei (2007) provided evidence that recasts and prompts develop both implicit and explicit knowledge in classroom settings. Erlam and Loewen (2010) demonstrated that implicit and explicit recasts help develop implicit and explicit knowledge in laboratory setting. R. Ellis et al. (2006) suggested that metalinguistic feedback has an advantage over recasts in the development of both implicit and explicit knowledge in classrooms, a result similar to that of R. Ellis (2007). However, R. Ellis et al. (2006) warned that further studies were needed in order to better test any differential effect and the current study was aimed at contributing to this discussion.

### **CURRENT STUDY**

Although the effectiveness of oral corrective feedback is fairly well-established (Li, 2010), most of the research focusing on this construct was developed in laboratory and classroom settings, while in computer-mediated communication environments research is scarce (Li, 2010; Mackey, 2012). Considering the unique characteristics of video-conferencing, and that in different environments (e.g., classroom and laboratory) feedback has been shown to have differential effects, the current study investigated the effectiveness of feedback in video-conferencing.

This study partially replicated R. Ellis et al.’s (2006) classroom-based study, which investigated metalinguistic feedback and recasts; however, different from R. Ellis et al., a FT-only group instead of a control was adopted in order to single out the effect of corrective feedback, a timed grammaticality judgment test was included (from R. Ellis, 2005), and it was performed in conditions similar to lab-based studies (refer to the methodology section for other minor methodological differences). The following research questions are addressed in the current study:

1. Which type of treatment (i.e., focused tasks plus metalinguistic feedback, FT plus recasts, or FT-only) increases learners’ implicit and explicit knowledge of the English regular past tense during video-conferencing interactions from the pretests to the posttests?
2. Is there any differential effect among the treatments?

### **METHODOLOGY**

A pretest/posttest/delayed posttest design was adopted in the current study and included three groups: FT + metalinguistic feedback, FT + recast, and FT-only. The participants were Brazilian English as a foreign language (EFL) learners, at a roughly low-intermediate level, who were randomly assigned to the groups. The treatment sessions included communicative tasks with focus on the target form (i.e., regular simple

past), and the tests measured explicit and implicit knowledge. The interactions were dyadic, face-to-face (i.e., video call was used), oral, synchronous, and computer-mediated.

### Participants

Participants volunteered to this study in answer to advertisements posted on Facebook and Orkut (i.e., social networks). When they sent an e-mail to the researcher agreeing to the terms of the consent form, they established a preferable time and day to meet weekly for the treatment sessions and for taking the tests. The tests and the treatments sessions were performed during video-conferencing interactions, with the researcher in her office in the USA and the participants in their houses/offices in Brazil.

A total of 65 participants volunteered to the study and took the pretests and first treatment session; however, only 42 had the targeted English level (i.e., low intermediate level) and completed all the posttests. From the 42 final participants, there were a total of 27 males and 15 females (mean age of 27.3, ranging from 18 to 42). The participants lived in 10 different states in Brazil, and were all native speakers of Portuguese. A total of 29 participants reported that they were enrolled in English classes at the time of the data collection, and the average time they reported to have studied English in a language institute was 2.7 years (ranging from one month to 10 years). The majority reported to have used Skype before (31 used and 11 did not).

The participants were randomly assigned to a group: FT + metalinguistic feedback ( $n = 15$ ), FT + recast ( $n = 15$ ), and FT-only ( $n = 12$ ). The average percentage of correct answers on the pretest was 59.4%, ranging from 25.5% to 80%.

### Target Structure

The structure targeted in the current study was the regular simple past tense as in R. Ellis et al. (2006). Following the same hypothesis as R. Ellis et al., learners at a low-intermediate level were expected to have some explicit knowledge of regular past tense, but not a complete mastery of it, making mistakes during unplanned interactions. In addition, it is a frequent and rule-based structure (R. Ellis, 2007), which can easily be learned explicitly. Any use of the irregular simple past or any other non-target forms were not followed by corrective feedback and were not considered in the analysis.

### Procedures

The research chose Skype as the software to perform the study because it allows for video-conferencing, sharing the interlocutors' computer screen, fast file transfers, and the sending of instant messages, all during video interactions. Only audio was recorded because for the purpose of this study audio recordings sufficed to gather the necessary data, and it was less threatening to the participants. The data collection started March 18, 2012 and finished July 31, 2012. On the first day of the data collection the learners took the pretests and the first treatment session. A week later, they took the second treatment session followed by the immediate post-tests; in the third week they performed communicative activities unrelated to the study, and in the fourth week they took the delayed post-tests and performed other activities unrelated to the project. [Figure 1](#) illustrates the research design.

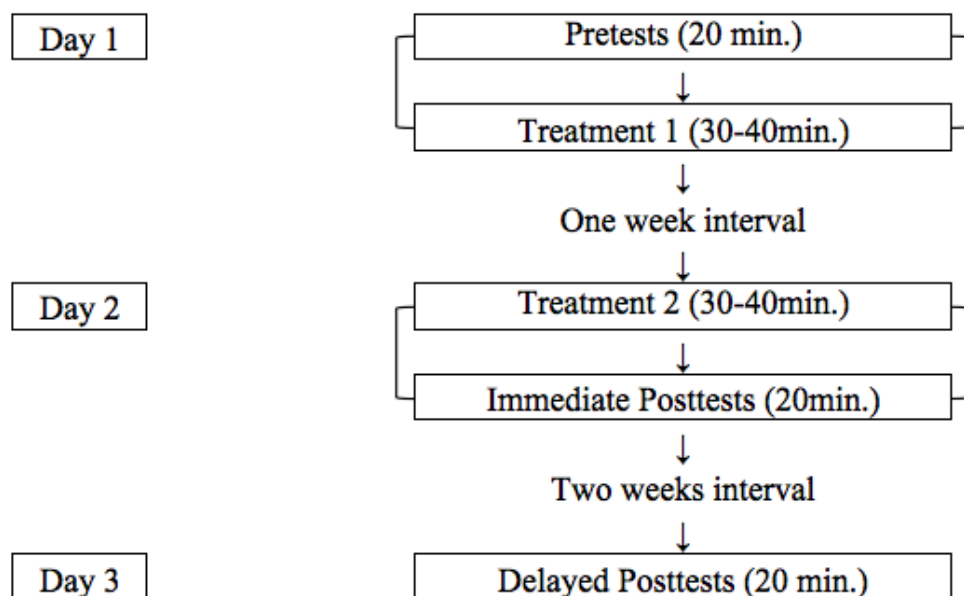


Figure 1. Experimental procedure.

### Instructional Materials

In dyadic interaction with the researcher, the participants performed focused tasks, defined by R. Ellis et al. (2006) as communicative tasks “designed to encourage the use of particular linguistic forms” (p. 352). The tasks required the use of the regular simple past by eliciting narratives through pictures, videos, story prompts, or questions. A tool offered by Skype (i.e., “Send Files”) was used to send participants the materials necessary for the tasks. There were three controlled tasks (i.e., the verbs to be used were provided by the researcher): (a) two picture description activities (see Appendix A for an example) and (b) a description of a silent movie (link at the time of the research: <http://www.youtube.com/watch?v=BWIPZvwcX8>), and three free-constructed tasks: (c) a story telling activity in which the participants were required to narrate three short stories/sentences in the past (one true story and two fictional stories), (d) a story creation task in which participants had to make up a story using a list of preset words (see Appendix B), and (e) answers to questions made by the researcher requiring participants to narrate events of their personal lives in the past (e.g., what presents did you receive last Christmas? Where did you travel to on your last vacation?), including distractors (i.e., questions requiring participants to use different verb tenses).

An average of one hour and twenty minutes was spent for the two treatment sessions. On the first day participants performed one picture description task, the description of the silent movie and the story telling activity [i.e., (a), (b), and (c)], on the second day participants performed another picture description task, the story creation task and answered to the questions targeting the use of simple past [i.e., (a), (d), and (e)]. All the groups performed the same tasks.

### Instructional Procedures

During the tasks, the researcher orally provided the appropriate feedback type (i.e., the text-chat option was not used) for each experimental group, except for the FT-only group. As in R. Ellis et al. (2006), the FT + recast group received a more explicit type of recast: declarative (i.e., falling intonation) and partial (i.e., the correct form of the verb was provided not in the context of a sentence), as illustrated in extract 1:

### Extract 1.

Participant: He drop his wallet yesterday.

Researcher: Dropped.

Participants in the FT + metalinguistic group had their non-target structure repeated and followed by a metalinguistic explanation, as in [extract 2](#).

### Extract 2.

Participant: He miss the flight.

Researcher: Miss – you should use the simple past tense.

## Testing Instruments

The pretests results and the participants' performance during the first treatment sessions were used as measures of proficiency. It was established that participants with a score higher than 80% would not be included in the study, and also those who showed an advanced or high intermediate command of English based on the personal judgment of the researcher.

As in R. Ellis et al. (2006), the current study adopted the following measures: an untimed Grammaticality Judgment Test (GJT), a metalinguistic knowledge test, and an oral imitation test. A timed GJT was also added, a test piloted by R. Ellis (2005). The measures are described below in the order they were administered.

### Untimed and Timed Grammaticality Judgment Tests

The untimed GJT ([Appendix C](#)) was included to assess explicit knowledge, while the timed GJT ([Appendix D](#)) was included to assess implicit knowledge (please refer to R. Ellis, 2005, for further information about how the measures used in the current study were developed and the logic behind them). Each type consisted of 23 items: eight grammatical, eight ungrammatical, and seven distractors for the untimed, and eight grammatical, seven ungrammatical, and eight distractors for the timed. Correct answers counted as one point while incorrect ones were counted as zero points.

For the untimed GJT only the grammatical/ungrammatical judgment was required, which differs from R. Ellis et al. (2006), wherein the subjects were also required to report the degree of certainty of each of their judgments and if they used feel or rule to answer to the test. For the timed GJT, participants were given two minutes and twenty five seconds to complete the test (20% more time than what native speakers used when the measures were piloted, as suggested by R. Ellis, 2005). One of the versions of the untimed GJT was borrowed from Loewen and Erlam (2006), whose study also replicated R. Ellis et al. (2006). The others were developed by the researcher and tested with native speakers of English.

Test reliability was calculated using Cronbach's alpha for the three versions of the untimed GJT: pre-test version, .636, immediate post-test version, .609, and delayed post-test version, .626; and for the timed GJT: pre-test version, .318, immediate post-test version, .216, and delayed post-test version, .450.

### Metalinguistic Knowledge Test

This measure ([Appendix E](#)) contained seven sentences, four targeting the past tense and three distractors. It was included to assess metalinguistic knowledge, a type of explicit knowledge (R. Ellis, 2005). Participants saw the sentences on their screen, and they were informed that the sentences had one grammatical mistake. Then they were required to correct each one orally and to provide an explanation for their correction. For each accurate correction of the past tense, participants received one point, and zero points for inaccurate ones. For each correct metalinguistic explanation they also received one point

and zero points for incorrect ones. Test reliability was calculated using Cronbach's alpha for the three versions of the metalinguistic knowledge test: pretest version, .885, immediate posttest version, .790, and delayed posttest version, .859.

### Oral Imitation Test

This measure (Appendix F) was included to assess implicit knowledge (R. Ellis, 2005) and it consisted of 23 belief statements: eight grammatical, eight ungrammatical, and seven distractors. The researcher informed the participants that some of the sentences contained one grammatical mistake and then read each statement twice. The participants were asked to orally correct the ungrammatical statements and repeat the grammatical ones. An appropriate imitation (i.e., the grammatical sentences were repeated as in the original) or appropriate correction was counted as one point. An inaccurate imitation (i.e., the target structure was not reproduced as in the original or was avoided) or inaccurate correction was counted as zero points. Different from R. Ellis et al. (2006), participants were not required to agree or disagree with the statements before attempting to imitate them; therefore, the focus of this test in the current study was on form and not on meaning. Although it would be preferable to have the statements recorded instead of read, since the participants took the tests on their computers from their houses while the researcher was in her office, reading was preferable in order to guarantee the quality of the listening and not to send a permanent audio file to the learners. Test reliability was calculated using Cronbach's alpha for the three versions of the oral imitation test: pretest version, .799, immediate posttest version, .648, and delayed posttest version, .694.

Each of the four measures was applied in time one, two, and three and in order to minimize test-retest effect, the order of the items was changed from pretest to posttests, and the referents of the sentences (e.g., subjects, adverbs) were modified. A small trial session was performed prior to the tests, with six statements for each measure, except for the metalinguistic knowledge test, where only two were used.

A second rater scored 20% of the oral imitation tests and 20% of the metalinguistic knowledge tests and interrater reliability was calculated. The lowest Kappa value of .61 was found for the first, and .77 for the latter, considered a substantial and acceptable agreement (Pallant, 2007). It is possible that agreement was not as high for the oral imitation test due to the low saliency of the morpheme *-ed*.

Participants saw the tests statements for the timed GJT, untimed GJT, and metalinguistic knowledge test through the option "Share Screens" on Skype, which allowed the researcher to temporarily show the items of the tests to the participants without sending them a permanent file, and they were required to type their answers through the text-chat option.

## RESULTS

The recordings of the treatment sessions were transcribed and the instances of feedback and target forms produced are provided in Table 1. Any indistinguishable items (because of the technological voice-chat environment) were eliminated from the analysis, requiring the results of the three versions of the oral test to be converted into percentages to allow comparison among participants' scores. In order to keep uniformity in the test results, the scores of all the four measures were converted into percentages.

**Table 1.** *Number of Target Forms Elicited and Feedback Provided.*

	<i>n</i>	Correct target forms elicited	Incorrect target forms elicited	Feedback provided
Metalinguistic	15	391	289	146
Recast	15	340	279	181
FT-only	12	219	267	4



One-way ANOVAs and Kruskal-Wallis (for the metalinguistic knowledge test, which was the only measure with non-normally distributed data) tests were utilized in order to test if the groups were statistically different at the onset of the study. The one-way ANOVAs indicated no statistical differences for the untimed GJT ( $F(2, 39) = .412, p = .665$ ), for the timed GJT ( $F(2, 39) = 1.501, p = .235$ ), and for the oral imitation test ( $F(2, 39) = 2.857, p = .07$ ). Kruskal-Wallis also revealed no statistical differences between the groups in regards to the metalinguistic knowledge test ( $\chi^2(2, 42) = 3.291, p = .193$ ); therefore, groups were statistically at the same level on the pretests.

Mixed ANOVAs were calculated in order to assess the effect of the treatment over time and any differential effect among treatments, with the scores of the four tests as within-subject variables and with groups (i.e., FT + recast, FT + metalinguistic, and FT-only) as between-subject variables. Alpha level was set at .05 for all measures and effect sizes were interpreted using Cohen's criteria: ".01 = small effect, .06 = moderate effect, .14 = large effect" (Cohen, 1988, as cited by Pallant, 2007, p. 273).

### Untimed Grammaticality Judgment Test

The descriptive statistics for the untimed GJTs are presented in Table 2. Statistical analyses indicated that the data were normally distributed and the assumptions of sphericity and homogeneity of variances were not violated. In order to answer the first research question (i.e., significance for time), within-subject analysis was calculated. A significant main effect for time was found,  $F(2, 78) = 5.421, p = .008$ , with large effect size ( $\eta^2 = .22$ ) and power of 82%, but there was no interaction effect: time X groups  $F(4, 78) = .201, p = .94, \eta^2 = .01$  and power of 9%. Figure 2 illustrates the development of the groups over time.

Table 2. Descriptive Statistics of the Untimed GJTs.

	<i>n</i>	Pre-test		Immediate post-test		Delayed post-test	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Metalinguistic	15	65.9	18.4	74.2	16	72.5	15.5
Recast	15	68.8	14.4	76.7	12.6	75.9	14.9
FT-only	12	71.4	13.7	76.6	14	78.7	13.9

In order to answer the second research question concerning differential effects among groups, a between subjects analysis was calculated. This analysis revealed no differences among groups,  $F(2, 39) = .483, p = .62$ , with small effect size ( $\eta^2 = .02$ ) and power of 12%.

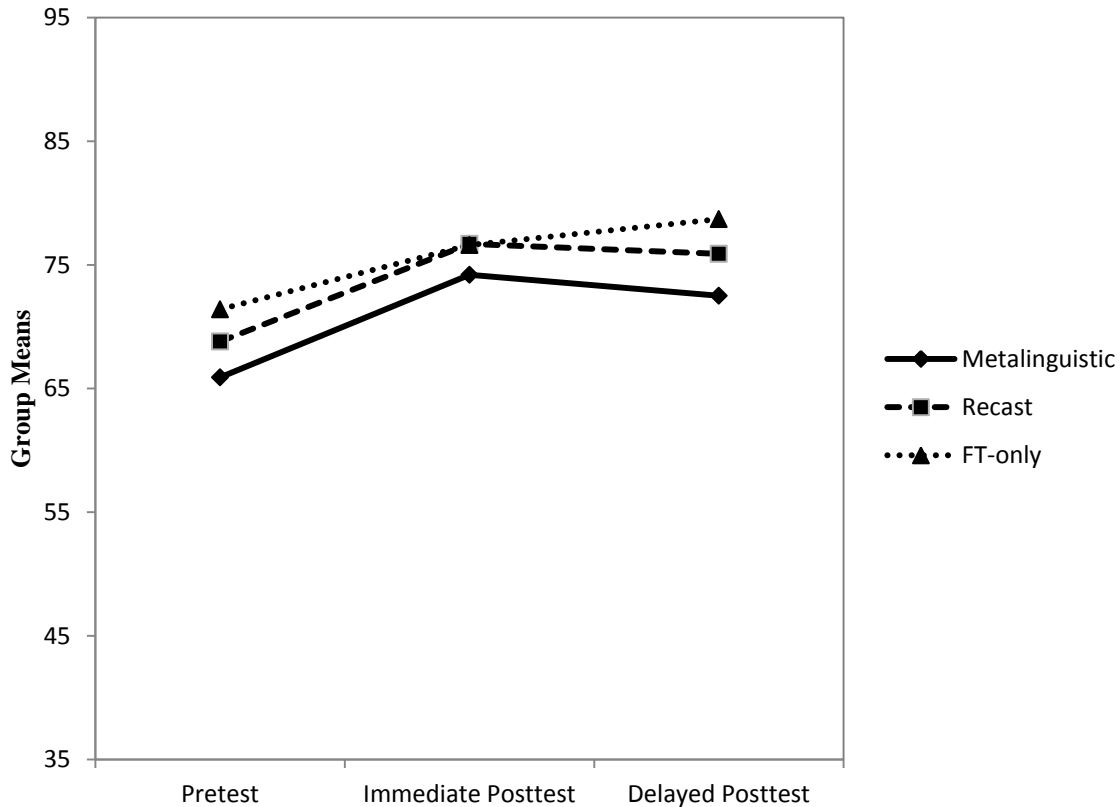


Figure 2. Group means for the untimed GJTs.

### Timed Grammaticality Judgment Test

The descriptive statistics for the timed GJTs are presented in Table 3. The data were normally distributed and the assumptions of sphericity and homogeneity of variances were not violated. In order to answer research question number one (i.e., significance for time), within-subject analysis was calculated. A significant main effect for time was found,  $F(2, 78) = 6.376, p = .004$ , with large effect size ( $\eta^2 = .25$ ) and power of 88%. No interaction effect was found for this measure: time X groups  $F(4, 78) = 1.122, p = .352, \eta^2 = .06$  and power of 34%. Figure 3 illustrates the development of each group over time.

Table 3. Descriptive Statistics of the Timed GJTs.

	<i>n</i>	Pre-test		Immediate post-test		Delayed post-test	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Metalinguistic	15	60	12.3	67.1	17.2	70.7	16.3
Recast	15	60	13.8	73.3	12.8	66.7	15.1
FT-only	12	67.8	13.3	72.8	10.4	71.7	11.4

In order to answer to the second research question concerning differential effects among groups, a between-subject analysis was also calculated. This analysis revealed no differences among groups,  $F(2, 39) = .783, p = .464$ , with small effect size ( $\eta^2 = .04$ ) and power of 17%.

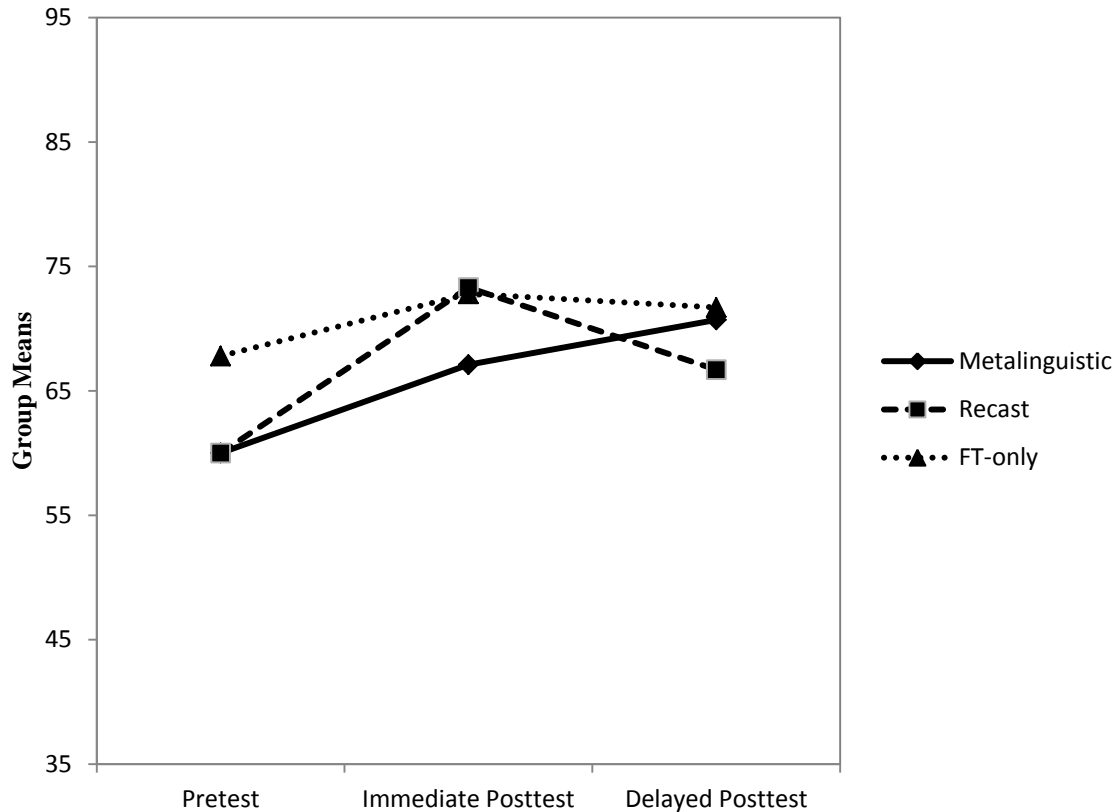


Figure 3. Group means for the timed GJTs.

### Metalinguistic Knowledge Test

The descriptive statistics of the metalinguistic knowledge tests are presented in Table 4. The data were not normally distributed and the assumptions of sphericity and homogeneity of variances were violated. In order to compensate for the violation of sphericity, the Greenhouse-Geisser values were used for testing the initial research question (i.e., significance for time). Since there is no non-parametric version for the mixed-ANOVA, there was not a way to compensate for the violation of normality; therefore, results from this measure must be interpreted with caution. A significant main effect for time was found,  $F(2, 78) = 20.112, p < .005$ , with large effect size ( $\eta^2 = .34$ ) and power of 100%. No interaction effect was found for time X groups:  $F(4, 78) = 2.194, p = .09, \eta^2 = .10$ , with 56% of power. Figure 4 illustrates the development of each group over time.

Table 4. Descriptive Statistics of the Metalinguistic Knowledge Tests.

	<i>n</i>	Pre-test		Immediate post-test		Delayed post-test	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Metalinguistic	15	45	41.4	84.2	28.5	76.7	32
Recast	15	68.3	33	86.7	15.3	90	20.7
FT-only	12	68.8	28.9	78.1	26.2	93.8	11.3

In order to answer the second research question concerning differential effects among groups, a between-subject analysis was also calculated. This analysis revealed no differences among groups,  $F(2, 39) = 1.452$ ,  $p = .247$ ,  $\eta^2 = .07$  and power of 29%.

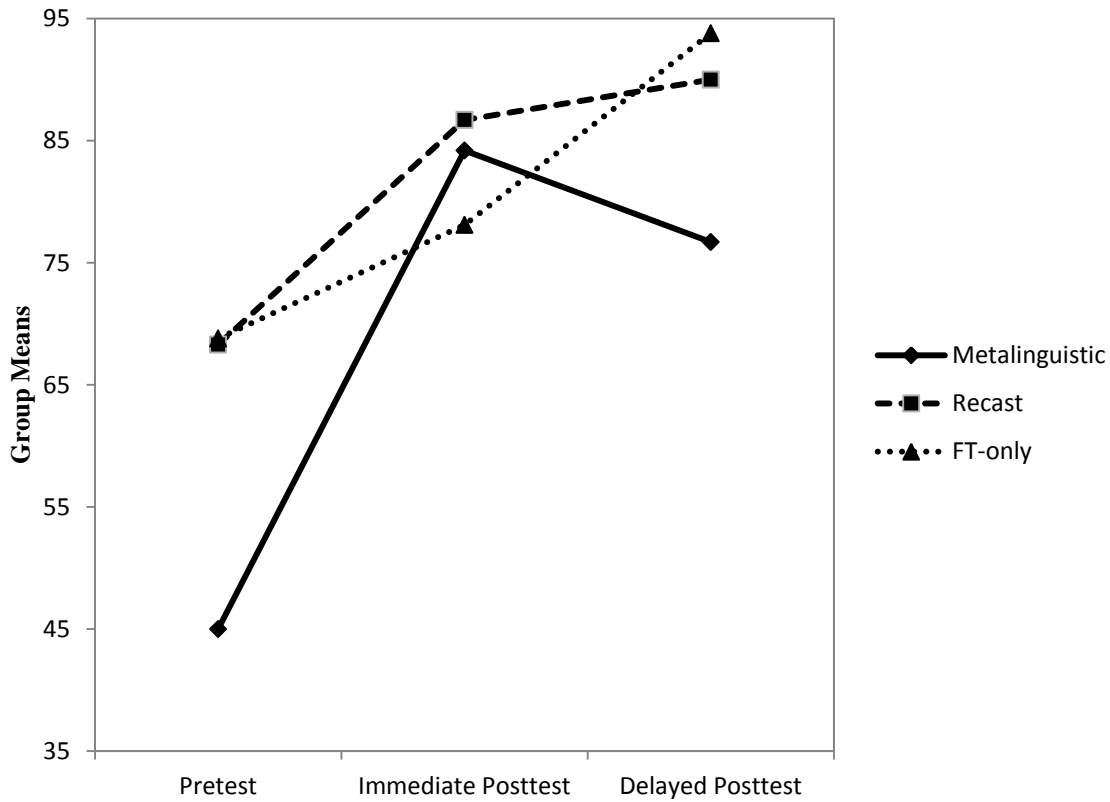


Figure 4. Group means for the metalinguistic knowledge tests.

### Oral Imitation Test

The descriptive statistics for the oral imitation tests are presented in Table 5. The data were normally distributed, and the assumptions of sphericity and homogeneity of variances were not violated. In order to answer research question number one (i.e., significance for time), within-subject analysis was calculated. Significant main effect for time was found,  $F(2, 78) = 8.736$ ,  $p < .005$ , with large effect size ( $\eta^2 = .32$ ) and power of 96%. No interaction was found between time X groups,  $F(4, 78) = 2.352$ ,  $p = .06$ , with moderate effect size ( $\eta^2 = .11$ ) and power of 66%. Figure 5 illustrates the development of each group over time.

Table 5. Descriptive Statistics of the Oral Imitation Tests.

	<i>n</i>	Pre-test		Immediate post-test		Delayed post-test	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Metalinguistic	15	39.3	23.1	51.9	21.1	54.9	24.9
Recast	15	45.3	21.3	49.8	20.2	59.2	23.2
FT-only	12	58.5	17.3	52.4	20.2	64.4	15.7

In order to answer the second research question concerning differential effects among groups, a between-subject analysis was also calculated. This analysis showed no differences among groups,  $F(2, 39) = .921$ ,  $p = .407$ , with small effect size ( $\eta^2 = .05$ ) and power of 20%.

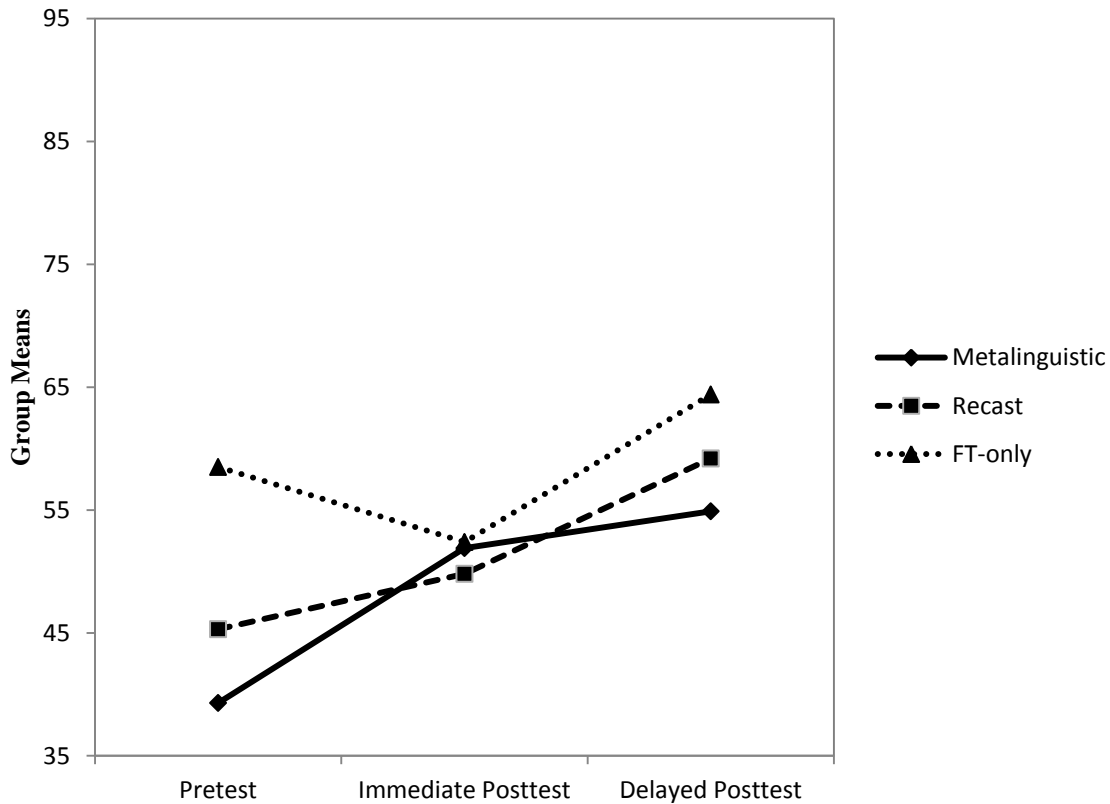


Figure 5. Group means for the oral imitation tests.

## DISCUSSION

The first research question asked if there would be significant gains over time for each individual type of computer-mediated interaction in the development of implicit and explicit knowledge: FT with metalinguistic feedback, FT with recasts, and FT-only. The results of the mixed ANOVAs revealed main effect for time for all four measures (with large effect sizes and high power values) and no interaction effect. Therefore, the answer to the first research question is that both corrective feedback types with focused tasks and focused tasks only are effective at helping learners develop explicit and implicit knowledge over time.

The effectiveness of metalinguistic feedback and recasts plus focused tasks adds support to laboratory-based studies that indicate that both feedback moves tend to be effective when they are intensive, individualized, and controlled (e.g., Loewen & Nabei, 2007; Lyster & Izquierdo, 2009). As explained by Yang and Lyster (2010), recasts help learners by allowing them to compare the target-like forms with their non-target like forms and store them in memory, while metalinguistic feedback forces learners to access and retrieve target forms from memory. Although those feedback moves activate different cognitive processes, the current study suggests that both are effective for the development of implicit and explicit knowledge in dyadic video and audio CMC interaction.

However, focused tasks only were also effective in promoting implicit and explicit knowledge. The

effectiveness of FT-only adds support to previous studies that suggest that intensive practice with focus on form by itself help learners develop knowledge of target structures (Erlam & Loewen, 2010; Loewen & Nabei, 2007; Sanz & Morgan-Short, 2004). Different from other studies which adopted one or two focused tasks (e.g., R. Ellis, 2007; R. Ellis et al., 2006) there were six focused tasks in the current study, all prompting the use of simple past; therefore, practice from these diverse tasks might have led participants to attend to form and restructure their interlanguage system. In fact, in the current study participants in the feedback groups produced a total of 1299 correct and incorrect target forms while in R. Ellis et al.'s (2006) study participants produced a total of 194.

The results reported above are different from the classroom-based study replicated here (R. Ellis et al., 2006), which found that metalinguistic feedback had an advantage over time in the development of the two knowledge types. Therefore, it is suggested based on the current study that during dyadic video-conference interactions, focused tasks, with or without corrective feedback, help learners develop implicit and explicit knowledge, a finding similar to Erlam and Loewen's (2010) laboratory study.

The second research question asked if the treatments would have any differential effects in relation to each other. The answer to this question is no, since the results of the between-subject analyses from the mixed ANOVAs indicated that there were no significant differences among groups and no interaction between time and groups was found. In addition, effect sizes were small for group comparisons. The lack of difference between the two feedback types might be explained by the fact that dyadic video-conferencing interactions are similar to laboratory interactions where feedback is controlled and individualized, making the corrective force of recasts as much evident as that of metalinguistic feedback. Similarly, the lack of difference between the feedback groups and the focused task only group might be explained by the intensity and length of the treatment sessions, which might have allowed participants to attend to form during the tasks.

Different from the current study, R. Ellis et al. (2006) found an advantage for the metalinguistic group over the recast and over the control group for most measures; whereas the recast group had almost no advantage over the control group. This difference is possibly related to the design of each study. R. Ellis et al. developed their study in classrooms, while the current one was developed in conditions similar to laboratory-based studies, which usually indicate that recasts and prompts are equally effective (e.g., Loewen & Nabei, 2007; Lyster & Izquierdo, 2009). In addition, in R. Ellis et al.'s, the control group did not perform the same tasks as the feedback groups; therefore, there was no opportunity for their participants to attend to the target form and thereby no comparison with the current study is possible.

It is important to note that the current study faced several issues related to research in video-conferencing, and with the strategy of gathering participants online. The first issue was related to the difficulty to control for previous instruction and for the type of instruction subjects had (e.g., grammar-oriented, communicative). Participants reported having studied English in language institutes from one month to ten years; therefore, some might have had more or less instruction of the target structure. Interestingly, some participants stated that they had studied English mostly by themselves, using online tools (i.e., websites directed to English learners, videos); therefore, they might not have had any type of instruction at all. In addition, teaching methodologies differ from one language institute to another, varying in terms of how explicit structures are taught. In order to reduce such variability, future researchers should gather participants at language institutes, where more homogeneous groups can be formed and where it may be possible to control for the previous instruction of target structures. Alternatively, when gathering participants online, researchers should narrow down who can participate in the study by requiring certain pre-requisites (e.g., individuals who never studied at language institutes, individuals who had a certain score at standardized tests). Another option is to include instruction of the target structure(s) as a variable. Despite the problems with the linguistic diversity of the participants, the variety of backgrounds also lends more validity to studies, because the results are not restricted to a single population.

The lack of control over the environment where participants took the tests and treatment sessions was another issue inherent to video-conferencing. Since most of the participants were connected with the researcher from their houses, the treatment sessions were constantly interrupted by phone calls, diverse outside noise (e.g., ambulances, TV sounds), messages coming from different sources on the participants' computers, technological problems, among others. In this particular respect, video-conferencing classes resemble traditional face-to-face classes where "distractor variables cannot be easily or entirely controlled" (Li, 2010, p. 316). While distractors might not be a methodological issue during the treatment sessions, it might constitute a confounding variable for test implementation. [Extract 3](#) is an example of a class that was interrupted by a soccer game on TV.

#### Extract 3.

- Researcher: Next one.  
 Participant 3: What I did before class? I worked... I worked.  
 Researcher: Next one.  
 Participant 3: Gol. ((Participant's comment on what was being transmitted on the television))  
 Researcher: Seu time fez um gol? You must be happy.  
 "Did your team score?"  
 Participant 3: Yeah.  
 Researcher: Let's continue though.

Controlling participants' access to computer and Internet tools (e.g., dictionaries, translators) during the tests was also an issue. Although the researcher required participants not to make use of such tools, since they used their personal computers from a place different from that where the researcher was, it is not possible to state with certainty whether or not the participants used them. One suggestion is that in future research with online distant testing, participants should be required to use the option "Share Screens" on Skype during the testing session. This way the researcher can control the participants' behavior on the computer being utilized. However, even with such a procedure there is the issue of access to other devices such as smartphones, making online distant testing a challenge for a study designed with participants in a location different from the researcher's.

Technological problems also affected this study in different ways. Intermittent background noises, low audio quality, or failures during some of the calls possibly affected the treatment effectiveness. In the current study, only 50.6% of the target structures produced incorrectly were followed by feedback in the FT + metalinguistic feedback group and 64.9% in the FT + recast group, while in R. Ellis et al. (2006) those percentages were 83.9% and 88.9% respectively. Analysis of the transcriptions suggests that the technological problems were one cause of the low feedback delivery, as illustrated in [extract 4](#). During this interaction there was a constant background noise from the call and three ill-formed target forms were not corrected in this single extract:

#### Extract 4.

- ((constant background noise from the call))  
 Participant 4: The wife arrive at work and at 10 o'clock she pack cans. She drinks coffee with your friend and check check out at 5. The wife arrive at house.  
 Researcher: Arrived.  
 Participant 4: And kiss... her husband.  
 Researcher: Great. All done.

Technological problems in future research could be prevented by requiring participants to have a bandwidth of 1.2 megabits or more, which is the amount suggested by Skype.com for high video-conference quality.

There are limitations in the current study unrelated to video-conferencing issues. It did not include a no-treatment group in order to test exclusively for test-retest effect. Since in the current study most of the test items targeted the use of simple past, this might have raised participants' awareness of the target structure, possibly affecting their performance on the posttests. Sample size was small and although power was high for main effect for time, it was low for group comparisons, indicating that more participants were needed. Test reliability was also an issue for the timed grammaticality judgment tests, suggesting that the results of this particular test must be interpreted cautiously. Finally, the measure of proficiency of the target structure was the pretests and the analysis of the descriptive statistics revealed that standard deviation was high for most measures, indicating that participants were possibly at different developmental stages and the current study did not control for that. As stated above, it is indispensable for future studies that include participants gathered online to better control for proficiency level.

Despite the limitations, this study adds some support to the pedagogical usefulness of focused tasks and feedback in video-conferencing interactions, and it suggests ways in which experimental research in oral and video CMC can be improved.

## **CONCLUSION**

The current study investigated the effectiveness of metalinguistic feedback, recasts, and focused tasks, using measures of implicit and explicit knowledge as in R. Ellis et al. (2006). It was suggested that intensive and individualized focused tasks, with or without corrective feedback, help develop both knowledge types, and metalinguistic feedback and recasts were shown to be equally effective. In addition, since the current study was one of the first which attempted to experimentally investigate video-conferencing interactions, several suggestions for future research were included here, such as the importance of preventing technological problems and better screening and assessing potential participants. Future research in video-conferencing is promising, since it allows not only for audio and video interactions, but also for the use of different modes (e.g., text chat, pictures) simultaneously; therefore, future studies should explore how those modes can be combined in order to enhance corrective feedback. Finally, at a time technology has been increasingly used in learning environments and as a learning environment per se, it is indispensable to understand how language is acquired with the mediation of computers. Notwithstanding the technological problems still present in video-conferencing and the challenges of distant online testing, research in this setting can only contribute to the pedagogical use of technologies.

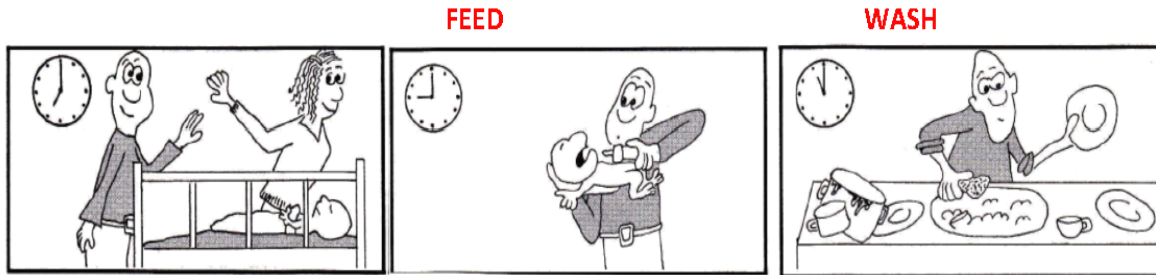
---



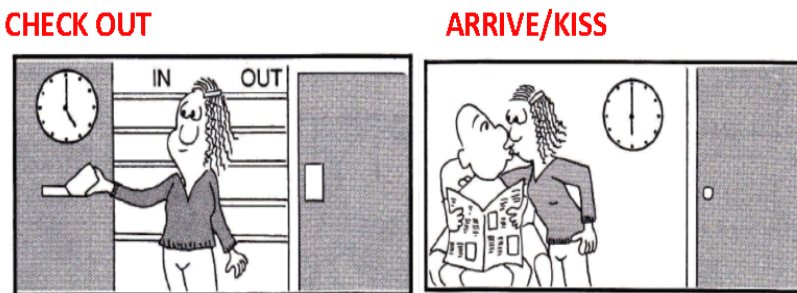
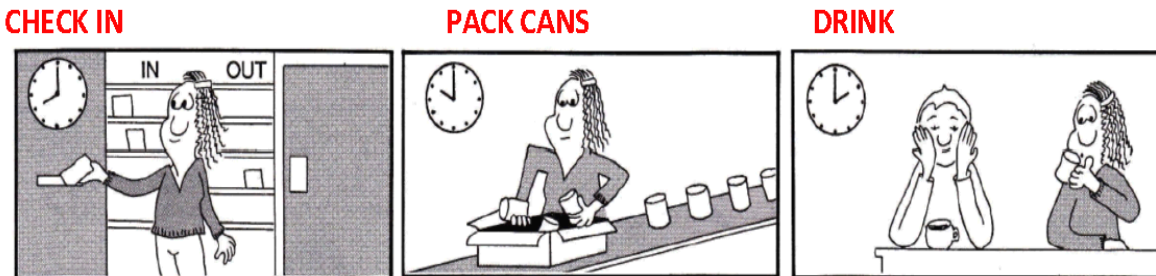
**APPENDIX A. Picture Description Task**

Continue the story:

Last Friday, at 7 a.m. the wife left for work and the husband...



Meanwhile, the wife...



Adapted from: Ligon, F., Tannenbaum, E., & Rodgers, C. R. (1991). More picture stories: Language and problem-posing activities for beginners. New York: Longman.

## APPENDIX B. Story Creation Task

Create a story with 10 out of the following 16 words. You should start the story like this: **On my last vacation...**



TV



BALL



FOOD



BEACH



GYM



AIRPLANE



PHONE



MUSIC



CARDS



NIGHT CLUB



HAWAII



SUN



SPOON



COMPUTER



MOUNTAIN



GUITAR

**APPENDIX C. Untimed Grammaticality Judgement Test****Pretest version:**

1. My mother cooked an apple pie last night.
2. From 1995 to 1999, Eduard lived in Europe.
3. Patricia wants to finding a new bicycle next year.
4. Lilian painted her walls last Wednesday.
5. Chris walked to the supermarket yesterday.
6. She has been living in Portugal since four months.
7. Mary finally saves money to buy an apartment.
8. My sister once paints a beautiful picture.
9. Luis wants to buy a car next week.
10. Kathy has been studying in Cambridge for three years.
11. Charles prepares dinner for his parents once.
12. Five years ago, they visit many interesting cities.
13. Lucas wanted to buy a bike last year.
14. They haven't seen Mary for a long time.
15. Janice visited her sister in London last summer.
16. When he was a child, he wants to be a doctor.
17. Chris works hard in his last job.
18. Peter has been studying French since a long time.
19. Alex says he wants to travel next year.
20. Patrick worked very hard last month.
21. A long time ago, Lucca watches horror movies.
22. He studied French two years ago.
23. In February 1939, it rains every day.

**APPENDIX D. Timed Grammaticality Judgment Test****Pretest version:**

1. I fail an exam last semester.
2. I talked to her yesterday night.
3. He finished work and walked to the park.
4. She buys an expensive dress soon.
5. I wait for the bus this morning.
6. They have to going to a meeting.
7. I like to eat chocolate every day.
8. We just dance for two hours.
9. I played soccer when I was younger.
10. I have been working here for three years.
11. I go to a party next week.
12. She will give she the book.
13. She never travels to Europe in her life.

14. I walked to school after I missed the bus.
  15. He likes fruits before.
  16. In January, a big accident happens.
  17. People lived better in the past.
  18. The mechanic perfectly repaired the car.
  19. I have never exercised for two hours.
  20. My friend finally asked for help.
  21. I just call my mother.
  22. They travel to the beach once.
  23. I looked through the window when I heard the noise.
- 

### **APPENDIX E. Metalinguistic Knowledge Test**

#### **Pretest version:**

1. An American invents Microsoft Word.
  2. I listen to music yesterday night.
  3. She like to play soccer.
  4. Thomas studies statistics before.
  5. My sister she is really smart.
  6. Classes start last February.
  7. You must to go to the doctor.
- 

### **APPENDIX F. Oral Imitation Test**

#### **Pretest version:**

1. I lived in Brazil for two years.
2. I talked to her on the phone yesterday.
3. We waited for one hour.
4. I like spend time with her
5. I will go to Brazil next year.
6. I studied French when I was a child.
7. She works there last year.
8. They walk to school this morning.
9. I don't like this book.
10. Send her that letters.
11. They stay at the party last night.
12. I arrive late once.
13. She arrived home and called him.
14. I work everyday before.
15. She get sick every winter.
16. I haven't gone yet.
17. I just noticed your dress.
18. I travel to Hawaii once.

19. This summer I painted my house.
20. He finally asks for a favor.
21. She invents this joke years ago.
22. You should to drink more water.
23. I finally saved some money.

---

## ABOUT THE AUTHOR

Kátia Monteiro received her Master's in Linguistics from California State University, Long Beach. Her areas of interest are language acquisition, computer assisted language learning, and corrective feedback.

**E-mail:** [katia.re.monteiro@gmail.com](mailto:katia.re.monteiro@gmail.com)

---

## REFERENCES

- Ammar, A. (2008). Prompts and recasts: Differential effects on second language morphosyntax. *Language Teaching Research*, 12(2), 183–210.
- Ammar, A., & Spada, N. (2006). One size fits all?: Recasts, prompts, and L2 learning. *Studies in Second Language Acquisition*, 28(4), 543–574.
- Carroll, S., & Swain, M. (1993). Explicit and implicit negative feedback: An empirical study of the learning of linguistic generalizations. *Studies in Second Language Acquisition*, 15(3), 357–386.
- Develotte, C., Guichon, N., & Vincent, C. (2010). The use of the webcam for teaching a foreign language in a desktop videoconferencing environment. *ReCALL*, 22(3), 293–312.
- Dilans, G. (2010). Corrective feedback and L2 vocabulary development: Prompts and recasts in the adult ESL classroom. *The Canadian Modern Language Review*, 66(6), 787–815.
- Ellis, N. C. (1994). Introduction: Implicit and explicit language learning—an overview. In N. C. Ellis (Ed.), *Implicit and explicit learning of languages* (pp. 1–31). San Diego, CA: Academic Press.
- Ellis, R. (2005). Measuring implicit and explicit knowledge of a second language: A psychometric study. *Studies in Second Language Acquisition*, 27(2), 141–172.
- Ellis, R. (2007). The differential effects of corrective feedback on two grammatical structures. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A series of empirical studies* (pp. 339–360). Oxford, UK: Oxford University Press.
- Ellis, R., Loewen, A., & Erlam, R. (2006). Implicit and explicit corrective feedback and the acquisition of L2 grammar. *Studies in Second Language Acquisition*, 28(2), 339–368.
- Erlam, R., & Loewen, S. (2010). Implicit and explicit recasts in L2 oral French interaction. *The Canadian Modern Language Review*, 66(6), 877–905.
- Goodfellow, R., Jefferys, I., Miles, T., & Shirra, T. (1996). Face-to-face language learning at a distance? A study of a videoconference try-out. *ReCALL*, 8(2), 5–16.
- Guichon, N., Bétrancourt, M., & Prié, Y. (2012). Managing written and oral negative feedback in a synchronous online teaching situation. *Computer Assisted Language Learning*, 25(2), 181–197.
- Hampel, R., & Stickler, U. (2012). The use of videoconferencing to support multimodal interaction in an online language classroom. *ReCALL*, 24(2), 116–137.

- Han, Z. (2002). A study of the impact of recasts on tense consistency in L2 output. *TESOL Quarterly*, 36(4), 543–572.
- Heift, T. (2004). Corrective feedback and learner uptake in CALL. *ReCALL*, 16(2), 416–431.
- Lai, C., & Zhao, Y. (2006). Noticing and text-based chat. *Language Learning & Technology*, 10(3), 102–120. Retrieved from <http://llt.msu.edu/vol10num3/pdf/laizhao.pdf>
- Lee, L. (2007). Fostering second language oral communication through constructivist interaction in desktop videoconferencing. *Foreign Language Annals*, 40(4), 635–649.
- Leeman, J. (2003). Recasts and second language development: Beyond negative evidence. *Studies in Second Language Acquisition*, 25(1), 37–63.
- Li, S. (2010). The effectiveness of corrective feedback in SLA: A meta-analysis. *Language Learning*, 60(2), 309–365.
- Lin, Y.-H., & Hedgcock, J. (1996). Negative feedback incorporation among high-proficiency and low-proficiency Chinese-speaking learners of Spanish. *Language Learning*, 46(4), 567–611.
- Loewen, S., & Erlam, R. (2006). Corrective feedback in the chatroom: An experimental study. *Computer Assisted Language Learning*, 19(1), 1–14.
- Loewen, S., & Nabei, T. (2007). Measuring the effects of oral corrective feedback on L2 knowledge. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A series of empirical studies* (pp. 361–378). Oxford, UK: Oxford University Press.
- Loewen, S., & Philp, J. (2006). Recasts in the adult English L2 classroom: Characteristics, explicitness, and effectiveness. *The Modern Language Journal*, 90(4), 536–556.
- Long, M. (1996). The role of the linguistic environment in second language acquisition. In W.C. Ritchie & T. K. Bhatia (Eds.), *Handbook of language acquisition* (pp. 413–468). San Diego, CA: Academic Press.
- Long, M. (2007). Recasts in SLA: The story so far. In M. H. Long (Ed.), *Problems in SLA* (pp.75–116). Mahwah, NJ: Erlbaum.
- Long, M., Inagaki, S., & Ortega, L. (1998). The role of implicit negative feedback in SLA: Models and recasts in Japanese and Spanish. *The Modern Language Journal*, 82(3), 357–371.
- Lyster, R. (2004). Differential effects of prompts and recasts in form-focused instruction. *Studies in Second Language Acquisition*, 26(3), 399–432.
- Lyster, R., & Izquierdo, J. (2009). Prompts versus recasts in dyadic interaction. *Language Learning*, 59(2), 453–498.
- Lyster, R., & Mori, H. (2006). Interactional feedback and instructional counterbalance. *Studies in Second Language Acquisition*, 28(2), 269–300.
- Lyster, R., & Ranta, L. (1997). Corrective feedback and learner uptake: Negotiation of form in communicative classrooms. *Studies in Second Language Acquisition*, 20(1), 37–66.
- Lyster, R., & Saito, K. (2010). Oral feedback in classroom SLA. *Studies in Second Language Acquisition*, 32(2), 265–302.
- Lyster, R., Saito, K., & Sato, M. (2013). Oral corrective feedback in second language classrooms. *Language Teaching*, 46(1), 1–40.
- Mackey, A. (2007). The role of conversation interaction in second language acquisition. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A series of empirical studies* (pp. 1–

26). Oxford, UK: Oxford University Press.

Mackey, A. (2012). Why (or why not), when and how to replicate research. In G. Porte (Ed.), *Replication research in applied linguistics* (pp. 21–46). Cambridge, UK: Cambridge University Press.

Mackey, A., & Goo, J. (2007). Interaction research in SLA: A meta-analysis and research synthesis. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A series of empirical studies* (pp. 408–452). Oxford, UK: Oxford University Press.

McDonough, K. (2007). Interactional feedback and the emergence of simple past activity verbs in L2 English. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A series of empirical studies* (pp. 323–338). Oxford, UK: Oxford University Press.

Nagata, N. (1993). Intelligent computer feedback for second language instruction. *The Modern Language Journal*, 77(3), 330–339.

Pallant, J. (2007). *SPSS survival manual*. Berkshire, UK: Open University Press.

Panova, I., & Lyster, R. (2002). Patterns of corrective feedback and uptake in an adult ESL classroom. *TESOL Quarterly*, 36(4), 573–595.

Russell, J., & Spada, N. (2006). The effectiveness of corrective feedback for the acquisition of L2 grammar. In J. M. Norris & L. Ortega (Eds.), *Synthesizing research on language learning and teaching* (pp. 131–164). Amsterdam, The Netherlands: John Benjamins.

Sachs, R., & Suh, B.-R. (2007). Textually enhanced recasts, learner awareness, and L2 outcomes in synchronous computer-mediated interaction. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A series of empirical studies* (pp. 197–227). Oxford, UK: Oxford University Press.

Sagarra, N. (2007). From CALL to face-to-face interaction: The effect of computer-delivered recasts and working memory on L2 development. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A series of empirical studies* (pp. 229–248). Oxford, UK: Oxford University Press.

Saito, K., & Lyster, R. (2011). Effects of form-focused instruction and corrective feedback on L2 pronunciation development of /ɪ/ by Japanese Learners of English. *Language Learning*, 62(2), 1–39.

Saito, K., & Lyster, R. (2012). Investigating the pedagogical potential of recasts for L2 vowel acquisition. *TESOL Quarterly*, 46(2), 387–398.

Sanz, C., & Morgan-Short, K. (2004). Positive evidence versus explicit rule presentation and explicit negative feedback: A computer-assisted study. *Language Learning*, 54(1), 35–78.

Sauro, S. (2009). Computer-mediated corrective feedback and the development of L2 grammar. *Language Learning & Technology*, 13(1), 96–120. Retrieved from <http://llt.msu.edu/vol13num1/sauro.pdf>

Sheen, Y. (2007). The effects of corrective feedback, language aptitude, and learner attitudes on the acquisition of English articles. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A series of empirical studies* (pp. 301–322). Oxford, UK: Oxford University Press.

Sheen, Y. (2010). The role of oral and written corrective feedback in SLA. *Studies in Second Language Acquisition*, 32(2), 169–179.

Spada, N. (1997). Form-focused instruction and second language acquisition: A review of classroom and laboratory research. *Language Teaching*, 30(2), 73–87.

Trofimovich, P., Ammar, A., & Gatbonton, E. (2007). How effective are recasts? The role of attention, memory, and analytical ability. In A. Mackey (Ed.), *Conversational interaction in second language acquisition: A series of empirical studies* (pp. 171–195). Oxford, UK: Oxford University Press.

Varnosfadrani, A., & Basturkmen, H. (2009). The effectiveness of implicit and explicit error correction on learners' performance. *System*, 37(1), 82–98.

Wang, Y. (2006). Negotiation of meaning in desktop videoconferencing-supported distance language learning. *ReCALL*, 18(1), 122–145.

Yang, Y., Lyster, R. (2010). Effects of form-focused practice and feedback on Chinese EFL learners' acquisition of regular and irregular past tense forms. *Studies in Second Language Acquisition*, 32(2), 235–263.

Yanguas, Í. (2010). Oral computer-mediated interaction between L2 learners: It's about time! *Language Learning & Technology*, 14(3), 72–93. Retrieved from <http://lt.msu.edu/issues/october2010/yanguas.pdf>

Yilmaz, Y. (2012). The relative effects of explicit correction and recasts on two target structures via two communication modes. *Language Learning*, 62(4), 1–36.