# Stimulated Recall as a Source of Insights into Negotiation of Meaning

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This article provides support for the use of stimulated recall as a method for eliciting research data in investigations of negotiation of meaning. In the study reported here, stimulated recall was the method of choice for capturing the thinking of a teacher and students as they negotiated meaning in an ESL classroom. Specifically, the method illuminated important aspects of the participants' mental processes, such as their interpretations, intended meanings, and rationale for decision making. Such insights into the participants' thought processes would have been impossible otherwise. The article describes the recall procedures used in the study and explores the potential benefits and limitations of the method for readers who may wish to adopt the method in their own empirical research.

## I. INTRODUCTION

Introspective methods have been used increasingly in second language (SL) research to determine the cognitive processes of L2 learners as they perform language tasks (Cohen, 2000; Gass & Mackey, 2000). The reason for the popularity of introspection as a data-elicitation tool among researchers is that "this methodology provides data on cognitive processes and learner responses that otherwise would have to be investigated only indirectly" (Cohen, 2000, p. 129). Thus, researchers use introspective methods to investigate a range of research topics that involve the inner workings of the mind. In modern research, the methodology has come to include a variety of techniques, such as think aloud, stimulated recall, and written reflection as in a journal. Each technique is compatible with different types of data and research questions. Needless to say, therefore, researchers trying to decide on a method should give careful consideration to the nature of the given data and research questions.

Of the introspective techniques, stimulated recall was used in the study described in this

article as one of the primary data sources in exploring negotiation of meaning between an instructor and learners in an ESL classroom. Negotiation of meaning refers to the interactional modifications that interlocutors make to resolve perceived or experienced communication breakdowns (Pica, 1994). Substantial research interest has been directed toward the role of negotiation of meaning as a particular type of interaction that has been claimed to contribute to language development. That claim, in fact, has been largely supported by empirical data. However, much of empirical research has been concerned only with observable data, and as a result the researchers cannot gain important insights into the process of negotiation of meaning. Negotiation of meaning involves such mental processes as perception, interpretation, and decision making. Therefore, any research study that fails to consider the internal aspects of negotiation of meaning may remain only partial.

The study reported in this article employed stimulated recall for data collection in order to illuminate the participants' thought processes, which are invisible but important aspects of negotiation of meaning. The purpose of this study was twofold: First, the study attempted to shed light on the participants' mental processes involved in negotiation of meaning. Second, in doing so, it highlighted the potential of a particular research methodology, stimulated recall, in exploring the issue under question.

This article first surveys stimulated recall as a research methodology and provides a rationale for using this methodology in the study of negotiation of meaning. Next, the article describes the use of stimulated recall in an actual study. The study, which addresses negotiation of meaning, exemplifies how effective the method can be as a data-collection tool for qualitative investigations. With this information, the readers should have a better understanding of how stimulated recall can increase the penetration of empirical observation to the levels of human thought and decision.

## II.  BACKGROUND

### 1. Introspective Methods

Introspection refers to "the process of observing and reflecting on one's thoughts, feelings, motives, reasoning processes, and mental states with a view to determining the ways in which these processes and states determine our behaviour" (Nunan, 1992, p. 115). Introspective methods have been used to address a wide range of topics in SL research to characterize the thought processes of L2 learners. Those topics include cognitive processes in general L2 production (that is, writing and speaking), comprehension (that is, listening and reading), and skill development (for example, vocabulary building and test-taking).

Other topics are the application of L2 learning strategies, development of L2 judgment (for example, grammaticality or acceptability), and decision making in L2 teaching and learning. (See Gass & Mackey, 2000, for a comprehensive review of introspection SL research.) In the corpus of L2 research, it has become clear that introspective methods have made a great contribution to our better understanding of second-language learning and teaching (Gass & Mackey, 2000; Leow & Morgan-Short, 2003). With those methods, human cognitive processes—notoriously opaque to mere observation—become transparent to scientific inquiry.

Introspective methods can be categorized into two types, depending on the temporal sequence of mental events: concurrent and retrospective. A typical method of concurrent verbalization is the think-aloud protocol, in which learners verbalize their thoughts about a task concurrently with their performance of that task. Although the think-aloud protocol is likely to provide an accurate report as it brings mental processes and the reporting of those processes closer together in time and place, it is obvious that it may not be the most suitable for all types of task or behavior. For example, participants engaging in a speaking activity will have great difficulty in simultaneously reporting their thought processes (Gass & Mackey, 2000). In addition, think aloud may not be practical for participants working on tasks in pairs or in groups. Moreover, some group settings—for instance, classrooms—may preclude the use of think aloud because the method induces essential changes in otherwise naturally occurring behaviors. For those reasons, think aloud has been restricted mostly to studies of individual task performances in experimental settings.

For research topics and settings incompatible with the use of concurrent think aloud, a viable alternative may be a retrospective method. For example, retrospective methods may be more reliable and effective for capturing verbalizations of cognitive processes that occur during oral interactions among multiple interlocutors. Retrospective verbalization, however, has its problems. After even a short time, a participant may forget the subtleties of an earlier activity or otherwise alter the activity in memory. Of the retrospective methods, stimulated recall may best reduce the memory constraints because the method provides concrete visual or aural cues to aid the participant's recall.

In an attempt to verify the reliability of stimulated recall, Bloom (1954, cited in Gass & Mackey, 2000) inquired into the relationship between accuracy of recall and lapse of time. He found that, if the recall was prompted within 48 hours, the accuracy of the recall was 95%. Gass and Mackey (2000) argued that stimulated recall "has an advantage over a simple *post hoc* interview in that the latter relies heavily on memory without any prompts" (p. 18). Many researchers have acknowledged those benefits, and today stimulated recall is the method of choice for investigations into a number of SL topics. The topics include L2 strategy (Poulisse, 1990; Poulisse, Bongaerts, & Kellerman, 1987), L2 writing (Bosher, 1998; Myung-Hye Huh, 2002), L2 reading and vocabulary (Paribakht & Wesche, 1997,

1999), and L2 oral interaction (Cohen & Olshtain, 1993; Dörnyei & Kormos, 1998; Mackey, Gass, & McDonough, 2000; Tyler, 1995). As discussed in this article, negotiation of meaning also seems a suitable research topic for the stimulated-recall method.

## 2. Negotiation of Meaning

Negotiation of meaning refers to the linguistic modifications made by interlocutors "during communicative interaction, when one interlocutor's message appears to be unclear, incomprehensible, or incomplete in its meaning" (Pica, 2002, p. 4). This particular type of interaction has drawn considerable attention in second language acquisition (SLA) because it may play a facilitative role in the development of language ability. Negotiation of meaning, as the argument goes, offers L2 learners increased opportunities to receive comprehensible input, produce comprehensible output, and attend to L2 form (Gass, Mackey, & Pica, 1998; Pica, 1994).

Long (1983a) claimed that interactional modifications made by native speakers directed toward L2 learners, such as clarification requests, confirmations of message meaning, and comprehension checks, could contribute to L2 acquisition by providing comprehensible input. Swain (1985) drew our attention to the related process of conversational interaction, "comprehensible output," arguing that comprehensible input does not necessarily lead to learners' development of grammatical, discourse, and sociolinguistic competence, and thus, learners' production of modified output is another essential element of L2 acquisition. She argued that, to achieve native-like competence, L2 learners should be "pushed toward the delivery of a message that is not only conveyed, but that is conveyed precisely, coherently, and appropriately" (p. 249) through meaning negotiation.

Both comprehensible input and comprehensible output, whether negotiated by native or non-native speakers, serve to focus the learners' attention on their current system of interlanguage forms. Learners' realization of gaps between their L2 forms and the actual forms in the target language triggers changes in the learners' interlanguage hypotheses and ultimately leads to L2 acquisition. This process, therefore, provides further theoretical support for the importance of negotiation in SLA.

A comprehensive review of previous studies on negotiation of meaning in SLA reveals that substantial research has been directed towards two issues: (1) the causal relationship between negotiation of meaning and language acquisition (Ellis, Tanaka & Yamazaki, 1994; Loschky, 1994; Nobuyoshi & Ellis, 1993; Pica, Young & Doughty, 1987); and (2) the effect of different types of interactional environment on the amount of negotiation of meaning. Types of interactional environment may vary according to task type (Doughty & Pica, 1986; Gass & Varonis, 1985; Pica, 1987), participant structure (Long & Sato, 1983; Oliver, 2002; Pica, Lincoln-Porter, Paninos & Linnell, 1996), age of participants (Oliver,

1998), gender of participants (Gass & Varonis, 1986; Pica, Holliday, Lewis, Berducci & Newman, 1991), and language proficiency of participants (Oliver 2002; Varonis & Gass 1985). In this research, negotiation of meaning has been dealt with largely as a single variable, either dependent or independent, and manipulated categorically and quantitatively. Considering the primary interests and ultimate goals of the field of SLA, it seems that this research focus has been warranted; however, the quantitative approach has failed to look into the meaning-construction processes that the participants go through in such interactions.

## 3. Using Stimulated Recall in Research on Oral Interaction

In SLA research, many models of the negotiation process comprise four stages: *trigger* (utterances or portions of an utterance that generate a comprehension problem), *signal* (something that indicates an occurrence of a communication problem), *response* (something that fixes the problem), and *reaction to response* (an optional stage in which the listener reacts to a previous response). The following exchange, which appears in Pica (2002, p. 4), exemplifies this model of negotiation of meaning:

> (L: English L2 learner; N: native speaker of English)
> L: The boys arrive at station                *(Trigger)*
> N: What did you say about the boy?           *(Signal)*
> L: They arrive at station                    *(Response)*
> N: Oh, really                                *(Reaction to Response)*

Varonis and Gass (1985) initially proposed the model, and with minor revisions the model has served as the principal norm for identifying negotiation routines in numerous studies. Of concern, however, is that the model forces a linguistic approach to the identification and analysis of negotiation of meaning. As a result, studies using the model tend to overlook the mental processes that lie beneath the observable utterances, for example, how meaning is perceived and how decisions are made. The actual utterances reflect only indirectly the perceptions and decision making of the interlocutors; they are neither complete nor accurate reflections of the underlying thought processes. Clearly, a careful examination of the mental processes would provide valuable insights into SLA. Even so, studies to date have omitted consideration of this inner component in their analyses of negotiation of meaning, probably because of the inherent difficulty of observing it. As an inevitable result, the studies have provided only partial accounts of the negotiation process. As pointed out by Allwright and Bailey (1991), "[M]any researchers deal only with observable data, but they may do so at the risk of missing important

insights" (p. 127) into the unspoken thought processes.

In this regard, the use of stimulated recall may benefit research on negotiation of meaning. Evidence for mental processes often passes unnoticed by interlocutors or the researcher because in many cases communication breakdown and its resolution are too subtle and instantaneous for real-time observation. Furthermore, because an L2 speaker's utterances are often fragmentary, it may be difficult to infer his or her meaning from what was said.

Despite the potential benefits, to this author's knowledge, no negotiation studies have employed stimulated recall to date; yet, the validity of the method finds empirical support in studies of other oral interaction. Tyler (1995), for example, examined miscommunication between a Korean male teaching assistant and an American female student in a videotaped tutoring session. Each participant reviewed the videotaped exchange separately, and each was asked to stop the videotape at any time to comment on anything that made him or her uncomfortable or confused. The researcher also stopped the tape at points to ask the participant what was going on. The stimulated recall data revealed that the participants had different interpretations of their roles and status, which resulted in miscommunication and misjudgments that the other was uncooperative. Interestingly, the participants were unaware of the conflicting interpretations that had brought about the miscommunication.

Dörnyei and Kormos (1998) identified sources of L2 communication problems and problem-management mechanisms in an analysis of communicative tasks performed by 44 Hungarian learners of English. The participants were asked to listen to recordings of their own interactions and to answer questions about and make comments on the difficulties they perceived in the interactions. By using stimulated recall, the authors were able to discover and confirm the problems that the participants actually experienced and the solutions that they produced.

Mackey, Gass and McDonough (2000) used stimulated recall to determine the accuracy of learners' perceptions of native speaker feedback. Learners of English as a second language and learners of Italian as a foreign language carried out a task-based activity in which participants interacted with each other in dyads to detect differences in two similar, but not identical, pictures. When the participants made non-target-like utterances, English- and Italian-speaking researchers provided various types of implicit negative feedback. Immediately after the task completion, the participants, while watching the video-recorded interaction, commented on their thoughts at the time of interaction (i.e., feedback episodes).

In summary, previous research suggests that stimulated recall can shed light on the mental processes of learners while they engage in oral interactions, which presumably include negotiation of meaning. This article reports an attempt to assess the potential of stimulated recall as a method specifically intended to illuminate issues in negotiation of

meaning. The internal processes of negotiation of meaning are potentially complex and rich in information about SLA, and for that reason, a study of negotiation of meaning may represent a significant test for the effectiveness of stimulated recall.

# III.  METHOD

## 1. Setting, Participants, and Data Collection

   This article is drawn from a larger study that investigated naturally occurring negotiation of meaning between a teacher and students in a classroom setting. The participants included one female teacher, Ms. W, and nine students (six women and three men) in an intermediate Listening/Speaking ESL class in a large American university. Five students were from Korea, two from China, one from Colombia, and one from Brazil. The student participants had resided in the U.S. less than a year.

   A qualitative approach was employed for data collection and analysis. The data in the larger study were collected in fifteen 90-minute classes throughout a semester. Data sources included weekly observations, field notes, video recordings, audio recordings, stimulated-recall interviews, participant interviews, and artifacts. The multiple sources were analyzed and interpreted for emerging themes and patterns.

   This article focuses on the findings about the participants' mental processes during negotiation of meaning, findings obtained mainly from stimulated recall. The next section describes the stimulated-recall procedure in detail.

## 2. Procedure of Stimulated Recall

   Eighteen stimulated-recall interviews were conducted with the participants throughout the semester. Each student participant was interviewed at least once (twice for some students) during the semester. Six interviews were conducted with the teacher. Normally, multiple segments were used for stimulated recall in an interview. Each interview lasted from approximately 30 to 90 minutes. The interviews included the following procedures: selecting segments of the audio- and/or videotaped classroom interaction as topics for stimulated recall, selecting recall interview participants, and conducting the stimulated-recall interviews.

   First, the participants and the researcher pre-selected segments for stimulated-recall interviews. Pre-selection of recall segments seemed practical in this case because it would otherwise be time consuming to play back a whole class session during an interview. Pre-selection relied on a combination of two sources, the teacher's notes and the

researcher's observations. Ideally, to narrow the choices to the most informative segments, the researcher would have consulted student notes. Before a given class, Ms. W and the participants had been asked to make notes, during or immediately after the class, of any instances of communication breakdown (see Appendix). Ms. W's notes offered useful information; however, the students' notes were not very informative. Not only did few students return their notes to the researcher at the end of the class, but their notes were so general that they added little to the researcher's observations. Taking notes during class might have been too intrusive for the students, and after class they seemed too pressed for time to write their notes and still make it to their next class. After a few class sessions, the researcher no longer asked students to take notes of their communication breakdowns, but continued to collect notes from Ms. W. Using those notes, as well as her own observations and field notes, the researcher selected audio and video segments of teacher-student interactions for the recall interviews.

After the segments were selected for stimulated-recall interviews, the participants in those segments were contacted as soon as possible (within 24 hours). In most cases, the interviews were carried out within 48 hours after the actual class. The interviews, which involved only one participant at a time, took place in a small room equipped with a VCR, a remote controller, and a cassette player. During each interview, the audio- and video-recordings of classroom interaction were used to stimulate recall. To compare the perceptions and emotions of interlocutors in the same recorded interaction, two or more participants would sometimes be asked to comment on the same segment.

Before the interview began, the participant was given the following directions for the stimulated-recall tasks:

> What you are going to do now is watch the video (or listen to the audio). I have already selected some parts for this interview based on what I observed and what you wrote on your communication breakdown note. You will watch (or listen to) the segment twice, but you can watch (listen to) the segment as many times as you want. I am interested in what you were thinking and how you were feeling **at the time** you were talking to your teacher (or student). I can hear what you were saying by looking at and listening to the video (or audio), but I don't know what you were thinking and how you were feeling. So, what I'd like you to do is to pause at any point and tell me what you were thinking, how you were feeling, what was in your mind **at that time** while you were talking to your teacher (or student). I will also pause and ask some questions about the segments. [Adapted from Gass & Mackey, 2000]

Stimulated-recall interviews were conducted in Korean with Korean students and in

English with the rest of the participants. The interviews were audiotaped and later transcribed.

In addition to conducting the recall interviews, the researcher also informally asked questions of the participants immediately after a given class about instances of negotiation of meaning taking place during the class. For this informal recall, the researcher's field notes were used as prompts. The questions were generally about what the student's had intended by certain utterances, how they had interpreted their interlocutor's messages, or why they did or did not pursue negotiation.


# IV.   RESULTS AND DISCUSSION

Stimulated recall turned out to be effective in revealing the participants' interpretations, intended meaning, and decision-making processes during negotiations of meaning. This section presents some of the interesting insights made possible by the method.

## 1. Comprehension Process Between the Teacher and Students

Comprehension in oral interaction is a complicated, multiple-layered cognitive process. Kramsch (1993, p. 47; citing Charaudeau, 1983) pointed out the complexity of achieving mutual comprehension by showing that it actually involves two processes: a production process and an interpretation process:

> The production process, by which an *I* addresses a *YOU* whom he or she believes (and wants) to match his or her communicative purpose;
>
> The interpretation process, by which an addressee *YOU* builds an image of *I*'s intentions and purposes, and possibly sends back to *I* a different image from that which *I* wanted to project. *I*, upon discovering that the interpreting *YOU* is not the same as the one imagined (and wanted), discovers in himself or herself another *I* (*I´*), which is the *I* perceived and constructed by the interpreting *YOU*. Of course, this process does not end there, but continues back and forth, across turns-at-talk, generating each time new levels of interpretation, new dimensions of self- and other-understanding—the essence of hermeneutic dialogue.

In this view, human beings are not passive recipients but active interpreters of meaning, making use of their perception of what is uttered and of how their interlocutors are

interpreting those utterances. Seen in this light, comprehension is inherently a social process involving the interlocutors. Because comprehension is a dynamic between any two interlocutors, however, it becomes difficult for an outside observer to capture the interplay of their mutual attempts at interpretation. The situation may be even more complex in L2 teacher-student negotiations of meaning because not only does the negotiation of meaning involve some type of comprehension problem, but students may also lack the linguistic resources needed to encode and decode meaning adequately. Example 1 demonstrates the complexity of the interpretation process.

Example 1

| 1 | Taemin[1]: | in Korea, in Korea, I, I look for… who did, who did wrote the note |
| 2 | Ms. W: | in Korea, what will happen? |
| 3 | Taemin: | I look for who di, who write the letter |
| 4 | Ms. W : | you will do what? |
| 5 | Taemin: | who, write the letter |
| 6 | Ms. W: | you would write a letter |
| 7 | Taemin: | who, who did write a letter about to me, I, I find him |
| 8 | Ms. W: | oh, so someone who just put a letter on your car? |
| 9 | Taemin: | yeah, I find someone |
| 10 | Ms. W: | what would the letter say? |
| 11 | Taemin: | is warning and then curse |
| 12 | Ms. W: | okay, so:: and you think that letter is more polite than just |
| 13 | | someone telling you |
| 14 | Taemin: | NO |
| 15 | Ms. W: | okay, so we get the same reaction. just in one case, someone's |
| 16 | | writing a letter, in another case, someone's telling you directly? is |
| 17 | | that the only difference? |
| 18 | Taemin: | yes, I think it's different. write, write a letter is a very serious |
| 19 | | reaction to that to person, writ// |
| 20 | Ms. W: | //OH, so writing a letter is more serious than just telling someone? |
| 21 | Taemin: | yeah |
| 22 | Sumi: | formal |
| 23 | Taemin: | yeah, formal and// |
| 24 | Ms. W: | //more formal, yeah |
| 25 | Taemin: | yeah. |

(colon(s): :: prolonging of sound; two slashes: //abrupt cut-off; capitals: loud speech)

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[1] Pseudonyms are used for the student participants in this manuscript.

This excerpt is a closing part of a lengthy interaction between Taemin and Ms. W. What Taemin had said, which was confirmed by stimulated recall, before the above exchanges occurred can be summarized as follows: "I parked my car in my apartment parking lot, taking up two spaces by mistake. An American left a warning note saying 'If you park this way again, your car will be towed.' I don't understand why he did not talk to me directly. I'm not sure this is common in America." Ms. W misinterpreted Taemin's meaning as "The American told (not wrote to) me not to park that way, and I was offended by the American's rude attitude." However, according to the recall data, Taemin did not know that he had been misunderstood at that moment. Thus, in the above interaction, Taemin was trying to say "If the same thing had happened in Korea, I would have found the person who wrote the note, because I could not have accepted it. I think leaving a written note is much more impolite than talking orally." However, Ms. W, building on her previous misinterpretation, ended up constructing a different meaning from what Taemin had intended. In a stimulated recall interview, Ms. W explained this interchange as follows:

> He said that the same situation occurs in Korea, but the method of communication was written rather than oral. So then I thought he was asking why someone would address the issue orally rather than in writing. I thought he was trying to make a point about how strange it was to him that someone would speak to him about the situation rather than write him a note. So I asked him questions focused on trying to figure out why that was so strange. For example, was it more polite to address someone in writing rather than orally? But he said the letter would be a warning and then a curse. So the content is the same; it was just the method of communication that was different. So what was it about, saying the same thing orally that was so strange to Taemin that he remembered it and found it noteworthy enough to bring up in the discussion? So, finally, he said writing it down was more serious. So I thought maybe he was saying that writing it down made the situation something he should pay attention to, but just saying it was a waste of time because if it's not in writing, that doesn't mean anything.

Clearly, Ms. W was making a diligent effort to construct the meaning that Taemin was trying to communicate, as evidenced by the interplay of her interpretations of Taemin's utterances, her belief about what was mutually understood up to that point, and her perception of how Taemin was interpreting her, as well as other contextual factors relevant to that moment. Likewise, Taemin was trying to bring Ms. W's interpretation in closer alignment with what he originally intended, as evidenced by his interpretations of Ms. W's utterances, his perception of himself as interpreted by Ms. W, and his assumption of what

had been shared so far. Both participants, as well as the researcher, believed that teacher and student had reached a mutual understanding, because they concluded the interchange with an agreement that "writing a letter is more serious than just telling somebody" (Lines 18 to 21). As Ms. W said in the recall interview, "I was not satisfied that I had correctly understood, but it seemed we had reached a point where we were both satisfied enough to move on".[2] The recall data revealed, however, that what Taemin meant by *serious* was in fact *rude*, while Ms. W interpreted it as *important*. This example illustrates that sometimes interlocutors do not recognize the differences among actual understanding, perceived understanding, and understanding on which they simply agree, and these differences cause difficulties in getting to a shared understanding.

Comprehension is a cumulative and dialogic process in that people engage in co-construction of meaning through the continuous interplay of *interpretation of utterances* and *interpretation of interpretation* within themselves as well as between them and their interlocutors. When this view is considered, observable data alone often does not clearly signal communication breakdowns, and the researcher has difficulty tracing such breakdowns to their origins or tracing them forward to their resolutions. This process may become even more complex in a classroom, because a number of potential interlocutors are present who can bring their interpretation to bear on an ongoing interaction at any given point, as Sumi did in the above example (Line 22).

Significantly, had the stimulated recall not revealed the participants' meaning-making processes, the example would have been considered "successful." Not only did the communication problems appear to be resolved, but the teacher also made continuous confirmation checks or clarification requests, to which the student responded with a great amount of modified output. In fact, underlying much of the previous research is the assumption that more negotiation leads to more acquisition. A quantitative analysis, however, may have falsely concluded that the above exchange was highly fruitful, when in fact the participants failed to reach a mutual understanding, and they were even unaware of that failure. As seen in the example, stimulated recall added valuable insights into the negotiation of meaning by illuminating the comprehension processes, processes inaccessible otherwise.

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[2] As this comment by Ms. W makes evident, "successful negotiation" of a given communication problem is rather a matter of perception. In other words, negotiation was deemed successful not when the teacher and student reached exactly the same meaning, something that would be inherently impossible, but when both parties were satisfied with the degree of their shared understanding, a level of understanding they believed was "good enough" to move on.

## 2. Discrepancy Between the Degree of Non-Understanding and Linguistic Realization

Previous research has largely considered *partial understanding* or *incomplete understanding* as a uniform construct. Yet, there exist different levels of partial understanding. When interlocutors have more precise perceptions of the degree of their understanding, they can contribute more effectively to negotiations. They can decide how to negotiate according to the degree of their perceived understanding and the degree of certainty of their perceived understanding. When faced with comprehension difficulties, a person may verbalize the problem and thus signal the communication breakdown. Of the well-known devices for signaling non-understanding, clarification requests and confirmation checks have been discussed most often in the literature; however, research has somewhat overlooked "multiple functions and also multiple realizations [of such devices], choice among which is not arbitrary" (Long, 1983b, p. 183). Despite Long's (1983b) call for further research, with few exceptions this issue has been neglected to date.

Rost and Ross (1991) classified strategies for signaling comprehension difficulties into three types: (1) *global strategies*, in which the respondent indicates non-understanding without identifying the trigger (for example, "What?" or "I don't understand"); (2) *local strategies*, in which the respondent indicates the precise location of the trigger (for example, "What does *disposal* mean?"); and (3) *inferential strategies*, in which the respondent tests hypotheses based on his or her interpretation of what is heard. Each type of strategy may indicate a different level of understanding. In addition to these strategies, the respondents may add particular phrases, such as "I'm not sure…," or "I think I understood, but I just want to confirm," to express the degree of their confidence in their understanding. Properly used, such linguistic devices allow the message sender to judge how close the recipient's interpretation is to what the sender originally intended. With that information the message sender can then utilize negotiation mechanisms that are effective for the specific problem.

In the previous example, the linguistic realizations of Ms. W's signals of non-understanding reflected how much she understood, how convinced she was of her understanding, and what she did not understand. For the students, however, who lacked sufficient linguistic resources, transferring their meaning to well-matched linguistic structures may have been so demanding that they were discouraged from displaying their non-understanding.

Sometimes the students were not able to articulate precisely the level of their comprehension problems, in which cases the teacher had to carry the greater burden of negotiation, not for repairing the problems but for identifying what needed repair. The following example illustrates how Feng's question, which did not reflect the actual level of her non-understanding, led to Ms. W's unnecessary explanation.

Example 2

| 1 | Ms. W: | any questions? |
|---|---|---|

1   Ms. W:      any questions?
2   Feng:       I have a question. eh, what is, what is garbage disposal?
3   Ms. W:      what is the garbage disposal?
4   Feng:       yes, because, because my, my kitchen has something wrong with
5               this, I think, but I don't know the name.
6   Ms. W:      oh, okay, a garbage disposal, (starts drawing) okay we have to
7               rely on my very poor drawing, okay here is a sink… underneath
8               the sink… there is a drain…, a garbage disposal is right here
9               underneath your sink. and you put the food down here and then it
10              goes to the pipe, and then goes to the disposal and it grinds up
11              everything.
12  Feng:       okay the food cannot, eh, go, eh to, eh, down, so (**)
13  Ms. W:      oh, so are you saying the food won't go down here? (pointing to a
14              sink in her drawing)
15  Feng:       oh, okay. I know.
16  Ms. W:      (making a puzzled look)
17  Feng:       I know you
18  Ms. W:      okay, but I'm not sure I understand. are you saying that the food
19              doesn't go down here (pointing to the sink), or the food doesn't//
20              (pointing to the drain)
21  Feng:       //the, the, the … down
22  Ms. W:      okay, so the food do:::es go down the drain, and goes down the
23              disposal, but your garbage disposal doesn't work?
24  Feng:       yes.
(asterisk(s) in parentheses: (**) inaudible speech)

Feng's question in Line 2 sounded a bit strange at the time because up to that moment the class had been engaged in a long discussion on the topic of *garbage disposal*. During a stimulated recall interview, Feng said, "I knew what a garbage disposal was, but I just wanted to confirm it. My garbage disposal was not working, but I didn't call the apartment manager because I didn't know the name. So before I called the office, I just wanted to confirm that what I had in mind was the same as the one the class was referring to as a garbage disposal." Her utterance in Line 4 also reveals that she already knew to some degree what a garbage disposal was. Although Feng tried to let Ms. W know that further explanation was not necessary because she already knew it ("I know" in Lines 15 and 17), Ms. W did not seem to understand this message. Regarding this segment, Ms. W said,

At that point, I thought she had asked what the garbage disposal was. Now I think she knew it, I mean, I can hear that on the tape now that she said "My kitchen has some problem, but I didn't know the name," but at that time, I didn't understand what it was she was saying, that's why I went on my whole description of what the garbage disposal was. So this is why I resorted to the drawing part, because we had already talked about it. . . . She said "I know, I know," so I was not sure what she was trying to ask me in the first place. So I was trying to understand what the question was.

In this case, had Feng used linguistic forms that more precisely reflected her need, she could have communicated her purpose better in her question to Ms. W. In a broad sense, this is an example of a discrepancy between the meaning of what the L2 learner intended and the meaning of what the speaker actually articulated. In fact, because of their limited L2 ability, learners often make utterances that do not properly reflect their intentions. When their interlocutors perceive L2 learners' utterances as unclear or incomplete, then the error becomes reparable because the problem comes to the surface. Errors that go undetected, however, may create a false sense in one or both interlocutors that they are sharing the same meaning. This problem is depicted well in Example 2, where the degree of non-understanding did not match the linguistic realization. The stimulated recall, however, proved effective in clarifying the L2 learner's true intentions.

## 3. Decision Making Regarding Whether to Negotiate Meaning

Negotiation of meaning is a juggling act that requires the participants to make moment-by-moment decisions. When one of the interlocutors perceives a communication problem, he or she must first decide whether or not to initiate negotiation. If neither participant decides to initiate negotiation, the opportunity to resolve the problem and thereby learn from it is lost. Alternatively, if the participants decide to initiate negotiation, as that negotiation proceeds they must constantly decide whether to continue the negotiation to its resolution or to abandon it.

Decision making, clearly a mental process, is largely invisible to an observer. When a participant decides not to initiate the resolution of a perceived problem or decides to abandon an effort to resolve the problem, the observer may have difficulty detecting the moment of the decision, because often at that point the participant feigns understanding. In addition, with only observable data, it is difficult to infer why a participant decides to pursue negotiation at one point, only to give up the effort at another point. (See Young-Sook Shim, 2005, for further discussion about important factors affecting participants' decision making in negotiation of meaning). In the study examined here,

however, stimulated recall was able to produce valuable insights into those decision-making processes. The following is an example.

Example 3
(The class is talking about unique jobs they know.)

| 1 | Taemin: | the driver who, who dri, drive (**) for drunk person |
| 2 | Ms. W: | the driver who drives… a what? |
| 3 | Taemin: | drunk, the drunk person, drunk |
| 4 | Ms. W: | a drunken person? |
| 5 | Taemin: | yeah |
| 6 | Ms. W: | ah, okay, so someone gives you free drives? free rides? |
| 7 | Taemin: | NO, no, that's… am, the… pay, they paid the, the person to drive |
| 8 | Ms. W: | like a taxi driver? |
| 9 | Taemin: | no, no, taxi… something like that, but different, eh, specifically |
| 10 | | other person (**) |
| 11 | Ms. W: | oh, really, I didn't know people who special// |
| 12 | Taemin: | //yeah |
| 13 | Ms. W: | oh, really, interesting |
| 14 | Taemin: | many people in Korea |
| 15 | Ms. W: | (laughing) so if I call a cab, they might say, "if you, sorry you are |
| 16 | | not drunken, I can't pick you up" hahahaha (laughing) |

In this example, Taemin was describing a unique job in Korea: a driver who drives for people too drunk to drive themselves. What Ms. W did not understand was that the driver drives the drunk person's car, not his own car or a taxi. In other words, the driver takes the drunk person to his or her home in the person's own car so that the person need not come back and pick up the car the next day. While the researcher had an accurate understanding of what Taemin was describing, probably because of shared background knowledge, Ms. W, who was not familiar with a service never seen in the U.S., initially misunderstood the driver to be a taxi driver who only picks up drunk people.

The utterances produced by the participants in Example 3 provided the researcher with good information about what was not understood and about how negotiation proceeded. Nevertheless, a few points remained unclear: Was Ms. W's comprehension problem finally corrected? Did Taemin believe that he had made himself understood in the end? If not, why did he decide to stop negotiating? To probe those questions, stimulated-recall interviews were conducted with the participants separately. According to Ms. W's remarks during her interview, her initial misunderstanding remained uncorrected at the end of the interchange, although she believed she had come to the proper understanding. Interestingly, Taemin said

he had been aware that Ms. W failed to understand his intended meaning. "At first, I tried to explain what I had meant. But after several attempts, I realized that Ms. W had still misunderstood it. At that time, I thought it was not going to happen. I thought it would be too hard to make her understand, because she did not have background knowledge about Korean culture and society. So I just stopped and acted as if our communication had gone just okay." This recall comment revealed that Taemin made a decision whether to pursue negotiation based on his perception of the deficiencies in the teacher's background knowledge of the ongoing topic. In many cases, including this one, stimulated recall provided interesting supplemental information to the data, information that allowed the researcher to tap into the decision-making processes involved in negotiation of meaning.

## V.   LIMITATIONS OF THE STUDY

Stimulated recall, just as with any other research method, has its shortcomings. Some of the drawbacks, which became apparent during the earlier study, are presented here for a more rigorous examination of the method for future research.

A particularly serious concern pertains to the time frame of the event itself and the stimulated recall. Participants sometimes reported new interpretations of their behaviors during the course of the recall interviews. This revision was not surprising. Typically, L2 students in class are cognitively occupied in a continuous effort to comprehend input and produce output; therefore, their understanding of a situation is often only partial at the time of interaction. The problem, however, is that the participants may fail to make a distinction in their reports between their new interpretations and the interpretations they had at the time of the interaction. For example, when a participant reports during the recall interview that "I misunderstood her at that time," two interpretations are possible: (1) "I perceived my misunderstanding at the time of the interaction," and (2) "I did not perceive my misunderstanding at the time of the interaction, but now I recognize it while reviewing the videotape." In addition, the students' inaccurate and inconsistent use of tenses ("I think I misunderstood her" versus "I thought I misunderstood her") sometimes obscures their intended meaning.

Being aware of these pitfalls, the researcher tried to focus the interviews on the earlier event. She frequently reminded the participants that they were to report their cognitive and emotional state at the time of the interaction in the classroom. In addition, the researcher often asked the participants to distinguish clearly in their replies between past and present interpretations (by asking, for example, "Is that what you thought at *that* time? Or is that what you think now?").

Another   methodological   limitation   of   the   study   was   that   interviews   with   some

participants were conducted in their second language, English. The choice of L1 or L2 for recall interviews is an important issue in the literature (Cohen, 1993; Gass & Mackey, 2000). Because of their imprecise word choices, people attempting to communicate their thoughts in a second language may distort or fail to communicate their intended meaning. "They may verbalize what they can, rather than the full version of what they were thinking" (Gass & Mackey, p. 98).

Interesting data relating to this issue are found in Mackey, Gass, and McDonough (2000). The authors found differences in the amount of commentary made by those speaking in their L1 and those speaking in their L2. In that study, L2 users had no comment for 12% of the data, while the L1 users had no comment for only 3.5% of the data. In addition, for the L2 users, the average number of words per recall comment was 16, whereas for the L1 users, the average was 26. It is likely that the choice of language for recall contributed to these differences.

In anticipation of this potential problem, this researcher gave the student participants the option to recall in their L1 with the assistance of an interpreter; however, the participants preferred to communicate in English, because they believed that the interview was a good opportunity to improve their communication skills. Therefore, the interviews were conducted in English without the presence of interpreters.

During the interviews, several tactics were used to ensure successful communication despite the students' lack of English proficiency. First, before starting an interview, the researcher created a comfortable and friendly atmosphere by engaging the students in small talk. In this way, the students were able to shed some of their communication anxiety. During the interview, the researcher always rephrased what she heard the students say to check her understanding. When they seemed stuck for a word, the researcher encouraged them by suggesting words, or she reassured them with supportive remarks (for example, "It's okay. We have plenty of time. Just take your time. Maybe you can give me an example or something."). Fortunately, the students were very willing to negotiate meanings with the researcher. During the interviews, they used every strategy available: looking up words in bilingual dictionaries, writing down words, drawing pictures, and providing examples. By these means, they were generally able to convey their meanings, though probably not as much as they could have expressed in their L1.

## VI.  CONCLUSION

This article provided evidence for the effectiveness of stimulated recall as a data-elicitation method in empirical research. In doing so, the article described how stimulated recall provided the author important insights during a study of negotiation of

meaning. In that study, stimulated recall data shed light on the participants' internal processes, such as their perceptions of comprehension, their intended meanings, and their decision-making processes. Knowledge of all those mental processes is essential for an understanding of negotiation of meaning.

To date, researchers in SLA have shown little concern with the complicated nature of the mental processes involved in negotiation of meaning. The probable reason for that neglect is that such processes are mostly unobservable. As a result, the previous research has relied solely on observable utterances, and few attempts have been made to penetrate the underlying complexity of the internal processes involved in negotiation of meaning. For example, researchers may have been too confident and naïve in their interpretation of an interlocutor's "Yes, I understand" as a sign of successful negotiation, when in fact those words did not necessarily reflect the interlocutor's actual understanding (not to speak of the frequent cases in which interlocutors feign understanding). In addition, previous researchers may have considered many instances of negotiation successful, when the interlocutors actually had abandoned their attempts to negotiate a shared meaning. Furthermore, because researchers have generally failed to look deeper into why interlocutors decide or decide not to negotiate at particular moments, they may have missed opportunities to understand negotiation as a learning behavior.

Clearly, we are never entirely privy to the mental processes of interlocutors. Nevertheless, a fine-grained research method like stimulated recall brings us nearer to understanding those processes. In the study examined in this paper, stimulated recall methodology rendered the analysis more reliable and useful by providing insights that would have been impossible by other methods. Obviously, stimulated recall, like any other methodological approach in SL research, has its failings and pitfalls, as discussed earlier in this article. Nevertheless, if researchers elicit their data carefully and interpret the data wisely, stimulated recall can allow SL studies to tap into rich, unseen data sources to supplement what can be observed about negotiation of meaning.

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## APPENDIX
### Communication Breakdown Note

Please write down any instance(s) of communication breakdown you perceived or experienced between you and your teacher (or student) in class today. What I mean by *communication breakdown* is a moment when you did not understand what your teacher (or your student) said, or when you think your teacher (or student) did not understand what you said. Take a brief note when this happens during class. Then right after class, try to recall the moment of communication breakdowns and expand your notes. Your expanded notes may include the description of your feelings, thoughts, behaviors, reactions, etc. at the particular moment(s) of communication breakdown.

Describe the moment briefly. When did it occur? Who said what?

*Expanded notes:*
1. When you did not understand what your teacher (or student) said,
   Did you make efforts to resolve the miscommunication? (for example, making a request for clarification, repetition, explanation, nonverbal expression, etc.)
      a) If yes, please write down what you did.

   As a result, was the miscommunication resolved? Or was it still left unresolved?

      b) If no (that is, if you did not try to resolve the miscommunication), why didn't you do anything even if you did not understand what your teacher (or student) said? What did you think and how did you feel at the moment?

2. When it seemed your teacher (or student) did not understand what you said

Did you make some efforts to make yourself understood when your teacher (or student) did not understand what you were saying? (For example, giving examples, elaborating, repeating, rephrasing, etc.)

   a) If yes, please, write down what you did.

As a result, was the miscommunication resolved? Or was it still left unresolved?

   b) If no (that is, if you did not try to resolve the miscommunication), why didn't you do anything even if your teacher (or student) did not understand what you said?

What did you think and how did you feel at the moment?

Applicable levels: secondary and college level
Key words: stimulated recall, negotiation of meaning

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