Does Subject Knowledge Make a Significant Contribution Beyond That of L2 Listening Ability to L2 Listening?

Hyun-Sook Chung

(International Graduate School of English)


This study was designed to explore whether prior study of a lecture topic enhanced proficient L2 listeners' performance on comprehension and recall of text information. The subjects of the study were 39 EFL graduate school students who were divided into two groups based on the scores on the listening section of TOEFL. Each student listened twice to passages (familiar vs. less familiar) and took comprehension tests. The subjects' comprehension was assessed with 10-item objective test. Additionally, 23 students of them received subject knowledge treatment afterward and took post-test. Results on the comprehension measure for the main effects of Topic familiarity in experiment 1 and Time of test in experiment 2 did reach significance. There was no significant effect for L2 listening proficiency level. Both the advanced and intermediate-high groups performed higher on the familiar topic and the post-test after subject knowledge treatment. Results showed no significant difference between the two groups' L2 listening comprehension due to proficiency level. The effect of subject knowledge did not vary according to the proficiency level.

1. INTRODUCTION

Listening comprehension is anything but a passive activity. It is a complex, active process in which the listener must discriminate between sounds, understand vocabulary and grammatical structures, interpret stress and intonation, retain what was gathered in all of the above, and interpret it within the immediate as well as the larger sociocultural context of the utterance. Co-ordinating all of this involves a great deal of mental activity on the part of the listener. Listening is hard work, and deserves more analysis and support. Listening comprehension as a separate and important component of language learning only came into focus after significant
debate about its validity (Vandergrift, 1999). Recent research has demonstrated the critical role of language input in language learning (Dunkel, 1991; Feyton, 1991), providing support for the primacy of listening comprehension in instructional methods. This has led Dunkel (1991) to assert that the study of listening comprehension has become the 'polestar' of second language acquisition theory building, research, and pedagogy.

Research has demonstrated that adults spend 40-50% of communication time listening, 25-30% speaking, 11-16% reading, and about 9% writing (Rivers, 1984). It follows that language learners will make greater use of comprehension skills. Whereas speakers can, at their own pace, use paralinguistics and other communication strategies to maintain communication, listeners must adjust to the speaker's tempo and active vocabulary. The ability to comprehend aural input has relevance for both language learning and language performance in an L2. From one viewpoint, listening comprehension is important in the L2 learning process in terms of access to comprehensible input (Swain, 1985). From another, being a competent listener is equally important for language learners living in the target language environment. In this environment, listening comprehension is important for everyday survival, ranging from understanding a salesclerk's directions on how to find the shoe department to understanding a teacher's classroom lecture and homework assignment. Consequently, research in L2 listening has focused on identifying what factors are involved in the process of listening and how variation in these factors affects the product of listening, that is, comprehension (Carrier, 1999).

It seems clear that prior knowledge affects listening comprehension such that both first and foreign or second language listeners may have better comprehension when they listen to material on topics for which they have appropriate prior background knowledge. Some first language studies have shown that background or prior knowledge about a topic can help listeners better comprehend passages concerning that topic. Subjects with high prior knowledge of topics demonstrated significantly greater comprehension of material about those topics than did those with limited prior knowledge (Levine & Haus, 1985). In second or foreign language listening, previous research has shown the effects of prior or background knowledge on listening comprehension. Some of this research has demonstrated these effects not only for culturally based background knowledge but also for discipline-specific prior knowledge (Alderson & Urquhart, 1988). More recently, however, Shohamy and Inbar (1991, p. 35) concluded that "while high level listeners seemed to process the text in a knowledge-based manner, the low level test takers seemed to process the text in a data-driven manner." Though subject knowledge has been assumed to influence one's listening comprehension in a second language, research investigating the effect of subject knowledge at different proficiency levels is somewhat controversial (e.g., O'Malley, Chamot, & Kupper, 1989; Schmidt-Rinehart, 1994). It appears that there may be two fundamental issues. Listeners with a high level of proficiency are more
likely to be able to call up appropriate schemata. Secondly, since their linguistic knowledge enables them to decode information at the word level more successfully and with less effort, they have more cognitive resources left over to work on constructing and integrating larger units of meaning (Jenson & Hansen, 1995). Thus, this study was designed to further explore the question of the effect of subject knowledge on proficient L2 listeners' comprehension and recall of text information. In a research design closely parallel to that of a previous study (Chung, 2001) the step in this investigation involved the collection of data in a procedure similar to the previous study. But in this study the additional data were collected after treatment (i.e., providing subject knowledge through subject-matter instruction) to examine the effect of presence of subject knowledge on comprehension of L2 text information. This is the first study of the effect of subject knowledge on L2 listening comprehension to employ graduate school students of English as a Foreign Language listening to authentic textual material and answering comprehension questions in a manner typical of the graduate school class. The research question that the current study tried to address is as follows: Does subject knowledge make a significant contribution to L2 listening performance irrespective of L2 listening proficiency?

II. THEORETICAL BACKGROUND

Spivey (1995) suggested that the listener/reader draws on a number of knowledge sources (e.g., rhetorical knowledge, background knowledge and experiences, and cultural knowledge) to build meaning from a text. This active negotiation between the listener/reader and the text results in a "constructed meaning" that is in direct contrast to the traditional notion of "referential meaning" located within texts. Constructivist views are consistent with a wealth of cognitive research demonstrating that prior knowledge is a critical component of listening/reading comprehension. For example, listeners/readers who possess high levels of knowledge consistently exhibit better comprehension and retention than listeners/readers with low levels of knowledge (Langer, 1981). Good and poor listeners/readers differ not only in the amount of knowledge they have available but also in how and whether they make use of their knowledge to facilitate comprehension. Good listeners/readers are more likely to use their prior knowledge throughout the listening/reading process than less able listeners/readers (Oakhill, 1984).

In recent research on the constructive processes involved in listening/reading, much of the discussion has centered on the knowledge sources that come into play in the reconstructing of meaning. Previously acquired knowledge can be seen as the starting point for constructing a mental representation of a text, while the minimal cues provided by the text itself are specific instantiations of the prior knowledge structure (Anderson & Pearson, 1984; Spiro, 1980). When
a listener/reader interacts with a text, his/her mental representation of that text is a result of combining the content and rhetorical organization of the immediate text with prior knowledge. In Flower's conceptual model for discourse construction (1987), external and internal forces impinge upon the listener/reader in his/her attempt to interpret a text. It is in the negotiation of these forces that the unique text or its interpretation is achieved.

Spivey (1990) has isolated three operations in the complex process of constructing meaning from text, operations that apply to listeners/readers. The operations are organizing, selecting, and connecting. "The listener/reader organizes textual meaning, selects textual content for the representation, and connects content cued by the text with content generated from previously acquired knowledge" (p. 257). This complex interaction between the available text and the less accessible knowledge of the listener/reader accounts for the multiple representations of meaning of any given text. Flower's (1987) separation of the outer circle of social context, discourse conventions, and language (what the listener/reader knows) from the inner circle of purpose and goals and activated knowledge (what the listener/reader uses at a given moment) frames for us a specific area that we can investigate in the process of constructing meaning, namely, activated knowledge. If we could intentionally activate certain schemata, we might be able to examine their influence on a listener's/reader's mental representation of a text. We know that knowledge is activated when parts of a text are found exciting or problematic and therefore demand more attention. Educator's awareness of the importance of activated knowledge is evident in pedagogical devices like the "advance organizer", introduced before learning a text to provide a conceptual bridge between the listener's/reader's prior knowledge and the propositions in the text that he/she is supposed to learn (Anderson & Pearson, 1984). The assumption is that the imposed schema will influence the listener/reader in the selection of certain parts of the text in order to organize a meaning that will help him/her answer the questions.

The role of background knowledge in language comprehension has been formalized as schema theory (Bartlett, 1932; Rumelhart & Ortony, 1977), which has as one of its fundamental tenets that text, any text, either spoken or written, does not by itself carry meaning. Rather, according to schema theory, a text only provides directions for listeners or readers as to how they should retrieve or construct meaning from their own, previously acquired knowledge. This previously acquired knowledge is called the listener's/reader's background knowledge, and the previously acquired knowledge structures are called schemata (Adams & Collins, 1979; Bartlett, 1932; Rumelhart, 1980). According to schema theory, comprehending a text is an interactive process between the listener's/reader's background knowledge and the text. Efficient comprehension requires the ability to relate the textual material to one's own knowledge. Comprehending words, sentences, and entire texts involves more than just relying on one's linguistic knowledge. As the quote from Anderson et al. points out, "every act of comprehension
involves one’s knowledge of the world as well” (Anderson, Reynolds, Schallert, & Goetz, 1977, p. 369).

According to schema theory, the process of interpretation is guided by the principle that every input is mapped against some existing schema and that all aspects of that schema must be compatible with the input information. This principle results in two basic modes of information processing, called bottom-up and top-down processing. Bottom-up processing is evoked by the incoming data: the features of the data enter the system through the best fitting, bottom-level schemata. Schemata are hierarchically organized from most general at the top to most specific at the bottom. As these bottom-level schemata converge into higher level, more general schemata, these too become activated. Bottom-up processing is, therefore, called data-driven. Top-down processing, on the other hand, occurs as the system makes general predictions based on higher level, general schemata and then searches the input for information to fit into these partially satisfied, higher order schemata. Top-down processing is, therefore, called conceptually-driven (Carrell & Eisterhold, 1983).

An important aspect of top-down and bottom-up processing is that both should be occurring at all levels simultaneously (Rumelhart, 1980). The data that are needed to instantiate, or fill out, the schemata become available through bottom-up processing; top-down processing facilitates their assimilation if they are anticipated by or consistent with the listener’s/reader’s conceptual expectations. Bottom-up processing ensures that the listeners/readers will be sensitive to information that is novel or that does not fit their ongoing hypotheses about the content or structure of the text; top-down processing helps the listeners/readers to resolve ambiguities or to select between alternative possible interpretations of the incoming data.

In seeking to understand the role of background knowledge in listening/reading comprehension, it is often useful to draw a distinction between formal schemata (background knowledge of the formal, rhetorical organizational structures of different types of texts) and content schemata (background knowledge of the content area of a text) (Carrell, 1983). In schema theory, this type of formal schemata knowledge is usually contrasted with content schematic knowledge, which is claimed to be background knowledge about the content area of a text. A listener’s/reader’s failure to activate an appropriate schema (formal or content) during listening/reading results in various degrees of non-comprehension. This failure to activate an appropriate schema may either be due to the speaker’s/writer’s not having provided sufficient clues in the text for the listener/reader to effectively utilize a bottom-up processing mode to activate schemata the listener/reader may already possess, or it may be due to the fact that the listener/reader does not possess the appropriated schema anticipated by the speaker/writer and thus fails to comprehend. In both instances, there is a mismatch between what the speaker/writer anticipates the listener/reader can do to extract meaning from the text and what the
listener/reader is actually able to do. The point is that the appropriate schemata must exist and must be activated during text processing (Carrell, 1987).

Thus, a growing body of empirical research attests to the role of both content and formal schemata in EFL/ESL listening comprehension. Second language listeners attempt to provide schemata to make sense of texts, and they do so persistently. However, these efforts will fail if the listener cannot access the appropriate existing schemata, or if the listener does not possess the appropriate schemata necessary to understand a text. Most commonly, accessing appropriate content schemata depends initially on textual cues; the phonemic display must be somehow restructured by the listener as meaningful language. At this point, general language processing skills are most important. For second language listeners, then, obviously some language proficiency is required to activate relevant schemata, and it is not surprising that failures to access appropriate schemata (i.e., comprehend) are often interpreted solely as deficiencies in language processing skills. Consequently, poor listeners are encouraged to expand their vocabularies and to gain greater control over complex syntactic structures in order to improve listening comprehension. Indeed, some listening problems are related to such language skill deficiencies. However, as we have noted, listening comprehension depends crucially on the listener’s being able to relate information from the text to already existing background knowledge (Johnson, 1982).

Whether or not the learner has prior knowledge of the topic being discussed has been shown to have an effect on listening comprehension (Chiang & Dunkel, 1992; Long, 1990; Schimidt-Rinehart, 1994), as it does on reading comprehension. In a study of EFL learners, Chiang and Dunkel (1992) found that learners who listened to a lecture on a familiar topic had higher comprehension scores than those who listened to a lecture on an unfamiliar topic. In studies of learners of Spanish as a foreign language, Long (1990) and Schimidt-Rinehart (1994) found the same higher comprehension rates for familiar passages than for unfamiliar ones. The study of Jenson and Hansen (1995), however, found that subjects’ performance did not differ significantly whether the text presented was on a familiar or unfamiliar topic. Their findings did not support the hypothesis that L2 listeners who have indicated prior knowledge of a topic will perform better on listening comprehension than listening skills alone would predict. Hence, the effects of prior knowledge on L2 listening comprehension are somewhat unpredictable.

The purpose of the present study was to examine these effects again using another population of subjects. These subjects are of interest because they are very proficient second language listeners. In Chung (2001), Business major subjects (who had taken Introduction to Statistics) at an advanced L2 proficiency level were not available and subject knowledge of Statistics did not help the Business major group involved in the study on L2 listening comprehension test. This study was a replication of my previous study with the following
exception: A proficient group that received the subject knowledge treatment was added. The question of interest was whether subject knowledge had a greater effect on L2 listening performance than L2 listening ability.

III. METHOD

1. Participants

The participants were 39 Korean students from a single school in Seoul, Korea. The students involved in the study were drawn from two classrooms. All participants were non-native speakers of English and had studied English as a foreign language for at least 10 years. There were 6 men and 33 women. For purposes of this study, participants were classified as either advanced (M = 43.63; standard deviation = 2.45) or intermediate-high (M = 36.06; standard deviation = 2.76) based on a mean split on the listening section of the Test of English as a Foreign Language (TOEFL), the possible range of which is 0 to 50 (raw scores). The purpose of this listening task was to assess participants’ listening comprehension skills in a normal standardized test setting. The mean score for the sample on the TOEFL listening section was 40.08 (standard deviation = 4.32). They all had taken the course “Introduction to Linguistics” last semester where the instructor used whatever language he had at his disposal to get the message across.

Moreover, to gain insight into whether or not providing the subject knowledge treatment lead subjects to more effective comprehension of a passage, 23 students who were enrolled in Introduction to Statistics (one of the two classes that participated in the study) were asked to take the comprehension test before and after the treatment. The pre-test, treatment, and post-test spanned 6 weeks. This exercise was meant to establish the degree to which performance on the post-test depended on subject knowledge.

2. Materials

Materials for this study consisted of the listening section of the Test of English as Foreign Language (TOEFL), two listening passages (Linguistics vs. Statistics) used by the previous study (Chung, 2001), and ten-item objective tests which were composed of short-answer questions and four-option, multiple-choice items. Passages were selected from Linguistics and Statistics textbooks in an attempt to provide some level of ecological validity of instructional and testing materials and to increase the opportunity for transfer to authentic academic listening
tasks. For each passage, a comprehension test was developed that included both literal and application-level questions. Each comprehension test contained 7 questions developed to test literal comprehension and 3 application-level questions developed to determine whether the listener could go beyond information in the passage to generate appropriate answers. Therefore, students had to use their own subject knowledge and ideas to formulate a response. The responses to the objective comprehension questions were scored using the following two-point scale: 1 point = a correct answer (maximum 10 points); 0 point = an incorrect answer or no response. Short-answer responses were not scored on spelling correctness, but on accuracy of content. All passages and corresponding tests were critiqued by two native speakers to establish content validity, which showed suitability of the passage and test as compared to the other passage and test and a similarity in its demands on the students.

3. Procedures

The listening section of the Test of English as Foreign Language was administered prior to the experiment and scored as directed in the manual of instructions for the test. All comprehension tests were administered to the students in their original classroom. All testing took place in the first week of the Spring semester of 2003. The investigator presented each one of the 39 subjects with a packet that consisted of the listening section of TOEFL, two listening passages and two L2 comprehension tests. They were told that the purpose of the exercise was to determine if their subject knowledge of the topic about which they were to listen would help them better understand.

Subjects were told to listen twice to the audiotaped passage hypothesized to be more familiar to them (i.e., Linguistics passage) and they were permitted to take notes while listening to the passage in order to eliminate memory storage problems. After the second playing, they answered ten objective questions. The comprehension test (see Appendix A) was spoken twice to the participants by the English native speaker on tape and the alternatives were given to them in written form on an answer sheet. To enhance the reliability of the test, the participants were instructed not to use guessing strategies. The identical procedure was followed for the other passage hypothesized to be less familiar to the participants (i.e., Statistics passage). The Statistics passage was presumed to be less familiar because they had not taken Introduction to Statistics.

Additionally, the same comprehension test for the Statistics text (see Appendix B) was administered to 23 students who were taking Introduction to Statistics in the Spring semester of 2003. These students participated in the first experiment mentioned above. The pre-test for the Statistics passage was given in the first week as a part of the first experiment and the post-test in