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The Use of Listening Comprehension Strategies to Facilitate Recall: The Effects of Learner L1 Background and Proficiency

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Contents

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Abstract in English

A plethora of studies have been conducted to investigate second language (L2) listening strategies (e.g., Vogel, 1995; Vandergrift, 1997; Chang, 2008); however, the way in which L2 learners use listening strategies to recall the content of academic lectures has not received much attention. In order to examine how learners' proficiency levels and first language (L1) backgrounds play a role in listening comprehension strategies and note-taking can be used to recall information on the TOEFL listening comprehension subtest, two groups of learners of English from different L1 backgrounds (Japanese and Chinese) at two different proficiency levels (intermediate and advanced) were investigated.

The results of the study showed that the advanced level learners tended to recall the gist of the lecture, make use of linking words to grasp the main idea, and make better use of their notes as compared to their lower proficiency level counterparts. The study also revealed differing patterns between Japanese and Chinese learners in terms of how they recalled the lecture information, as well as the quality and quantity of notes they took. To be specific, the Chinese participants used more words and characters in their L1 to take notes than their Japanese counterparts. It is argued that the similarities and differences between English and participants' L1 in terms of syntactic structures may have affected how Chinese and Japanese participants took notes. In addition, the different types of language training received by Japanese and Chinese learners of English in their own countries might have been partially reflected in the differing strategies they used in the current study.

Keywords: Listening comprehension strategies; recall; note-taking

Abstract in Japanese

要旨

数多くの L2 聴解ストラテジー研究が行われている（Vogel, 1995; Vandergrift, 1997; Chang, 2008 等）が、L2 学習者が聴解ストラテジーをどのように学術的講義の聴解内容のリコールに役立てるのかを調査した研究はごくわずかである。本研究は、TOEFL のリスニング問題の内容をリコールするため学習者がどのように聴解ストラテジーおよびノートテイキングストラテジーを使用しているか調査したもので、学習者の母語（日本語・中国語）と英語熟達度レベル（中級・上級）がストラテジー使用に与える影響を考察した。その結果、上級学習者は中級学習者に比べ、聴いた講義の概要を把握するように努め、講義内容の中枢的な意味を理解するために接続表現に着目し、そして中級レベル学習者に比べ自らがとったノートをより着実に利用していることも分かった。また、日本語を母語とする学習者と中国語を母語とする学習者間でも聴解ストラテジー使用と、ノートの質や量も違うことが明らかになった。具体的には、中国人英語学習者はノートを取る際、母語を多く使用する傾向があるのが分かった。このようなストラテジー使用の違いは、日本語・中国語の英語との統語的相違性・類似性によってもたらされた可能性があること、また学習者がそれぞれの母国で受けた訓練の影響も一部関係しているのではないかと考えられる。

キーワード：

聴解ストラテジー、リコール、ノートテイキング

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Chapter 1: Introduction

1.1 Introduction

In the field of second language acquisition, there is a growing interest in studying listening comprehension competency (Oxford, 1996; Goh, 2002; Vandergrift, 2007; Chang, 2008). Previous studies have focused on the listening comprehension process, listening comprehension strategies, academic lecture comprehension, and listening assessment (Vandergrift, 2007). Particularly, stimulated by the effects of using listening comprehension strategies, a number of researchers have been concerned with discovering how L2 learners with different language proficiency levels utilize various listening comprehension strategies to overcome difficulties in audio materials (Goh, 2002; Vandergrift, 2003b; Chang, 2008). In other words, previous studies have paid more attention to how L2 learners decode information at the stage of playing audio materials. However, the way in which L2 learners retrieve or recall information at the stage of completing listening comprehension tasks has scarcely been observed or studied (Vogel, 1995; Liu, 2015).

Some standardized English tests, including TOEFL and TEM-8[1], have unique test formats. Test takers of the two tests are not allowed to view the listening comprehension tasks until they have finished listening to the audio materials. Under such circumstances, the test difficulty increases dramatically as test takers must recall what they have heard in order to complete the corresponding comprehension tasks. A number of researchers have investigated the relationship between working memory capacity and cognitive performance (Daneman & Carpenter, 1980; Call, 1985; Vogel, 1995). The phonological loop, a crucial element in working memory capacity, enables

L2 listeners to hold and recall verbal information (Revesz, 2012). During the stage of completing listening comprehension tasks, it is common for L2 listeners to recall information that they have processed, using listening comprehension strategies. Previous researchers have discovered that advanced listeners are adept at using cognitive and metacognitive listening strategies (Vandergrift, 1997; Chang, 2008); however, research focusing on how L2 listeners use specific listening strategies to recall content is scarce (Vogel, 1995; Liu, 2015). Vogel (1995) revealed that learners who perceived themselves to be the most strategic listeners outperformed those who perceived themselves to be the least strategic listeners on recall tests. However, he did not delve into the relationship between learners' proficiency levels and recall ability using listening comprehension strategies. Liu (2015) showed that successful listeners are more likely to recall the gist of a lecture and its details than their less successful counterparts. However, Liu's (2015) study did not distinguish between the different kinds of details included in the questionnaire. According to Vandergrift (1997), metacognitive and cognitive listening comprehension strategies can be sub-divided into specific listening comprehension strategies, such as focusing on complete information units. It is essential to gain a better understanding of how L2 learners use listening comprehension strategies to facilitate recall and the present study attempts to fill this gap by investigating how advanced and intermediate learners recall content using listening comprehension strategies when they correspond to listening comprehension tasks.

The present study selected academic lectures from the TOEFL iBT listening comprehension subtest. According to Carrell (2007), TOEFL PBT is being phased out, and more first-ranking universities now accept TOEFL iBT scores. In Asia, English learners from different L1 backgrounds strive to prepare themselves for the TOEFL listening comprehension test, so selecting audio materials from the TOEFL iBT listen-

ing comprehension subtest is of practical significance. L2 learners are inclined to utilize listening comprehension strategies when they face difficulties (Vandergrift, 1997), but relevant studies have shown that learners of English from heterogeneous L1 backgrounds select different listening comprehension strategies (Hu, 2002; Takeuchi, 2003). They similarly discovered that Japanese and Chinese learners of English select different listening comprehension strategies in order to process audio materials in English; however, whether Japanese and Chinese learners of English select different listening comprehension strategies to recall information later remains unanswered. Thus, the researcher also aims to address this question in the present study.

As mentioned above, test takers of TOEFL iBT are not allowed to view listening comprehension questions until they have finished listening to the corresponding lecture. To retain key information, test takers must take notes while listening. Note-taking is regarded as an important and useful strategy by a number of L2 learners, as they maintain that taking notes allows them to be more concentrated on audio materials and to retain information (Carrell, 2007). Therefore, more and more researchers have studied the criteria for evaluating the quality of note-taking, how to improve the quality of notes taken by test takers, and the relationship between quality of note-taking and test performance (Norton, 1981; Nye, 1978; Dunkel, 1988; Carrell, 2007; Song, 2011; Thorley *et al*., 2015).

Note-taking is a vital strategy that facilitates test takers' ability to encode and store information, and a small number of researchers have studied how cultural aspects may affect note-taking (Dunkel, 1988; Liu, 2001; Carrell, 2007; Song, 2011). As the quality of notes and test performance is positively correlated (Dunkel, 1988; Cushing, 1993; Carrell, 2007), both L1 speakers and L2 learners must take notes to perform well in the following comprehension test while listening to academic lectures

used in the TOEFL listening section. Dunkel (1988) compared the quality of notes taken by L1 speakers and L2 learners and discovered that the number of information units and total number of words could be predictors of L1 speakers' listening comprehension test performance, while test-answerability score and total number of words could be used to predict the performance of L2 test takers. The test-answerability score equals the total number of test questions answerable from subjects' notes (Dunkel, 1988). Dunkel's study showed that differences existed in the notes taken by L1 speakers and L2 learners; however, it did not examine the differences in notes taken by L2 learners from heterogeneous L1 backgrounds.

Few researchers have studied the characteristics of notes taken by L2 learners from different L1 backgrounds separately (Liu, 2001). Liu's (2001) study analyzed the notes taken by Chinese learners of English while listening to academic lectures both qualitatively and quantitatively, but did not make a comparison between notes taken by Chinese learners of English and notes taken by L2 learners from other L1 cultural backgrounds. Therefore, it remains unclear if and how L1 background might affect the ways in which L2 learners take notes while listening to lectures. Within the increasingly globalized world, to increase their competitiveness, learners of English from different L1 backgrounds strive to perform well in English listening comprehension competency (Vandergrift, 2007). The features of notes taken by L2 learners from different L1 backgrounds should be compared, to shed light on how to take effective and quality notes so as to improve L2 learners' listening comprehension competency.

In summary, the present study aims to provide instructive and useful information concerning the differences in the use of recall strategies between L2 learners at different language proficiency levels (advanced and intermediate) from different L1 backgrounds (Chinese and Japanese). Specifically, the study aims to fill in a number

of gaps in the field of L2 listening comprehension research.

1) The study will investigate whether language proficiency and L1 background play a role in using listening comprehension strategies to facilitate recall. Based on the findings, the researcher aims to demonstrate the most frequently used listening comprehension strategies that can be utilized by advanced and intermediate learners to recall information. Distinguishing effective from ineffective listening comprehension strategies would enhance the study efficiency of L2 learners. Ascertaining the differing adoption patterns of listening comprehension strategies used to facilitate recall between L2 learners from different L1 backgrounds could raise EFL teachers' awareness of the characteristics of L2 learners from heterogeneous L1 backgrounds, which could both enhance their faculty and benefit their students. Related functionaries in different Asian countries have devised new curriculums to help the learners of English in their respective countries. By analyzing the differences in how learners of English from different L1 backgrounds use listening comprehension tactics to recall information, the researcher aims to find out the process of acquiring English, which might promote cooperation in the field of second language acquisition between different Asian countries. Two academic lectures from TOEFL iBT listening comprehension subtest and a questionnaire (Vandergrift, 1997) were used to achieve these goals.

2) The present study will also ascertain the differences in notes taken by L2 learners at different language proficiency levels from different L1 backgrounds. Although the role of note-taking in listening comprehension has been acknowledged, note-taking has not been included as an indispensable part of traditional English listening comprehension classes. By displaying the differences in notes taken by English learners at different language proficiency levels from heterogeneous L1 backgrounds, the researcher aims to demonstrate which variables in evaluating note quality are correlated

with L2 learners' test performance. In this way, L2 learners may understand how to take effective notes, and EFL teachers may also comprehend how to transform and update their teaching materials on note-taking. Carrell's (2007) note-coding method will be used in the present study, as her method specializes in analyzing notes taken by test takers of TOEFL iBT.

3) The note-coding method will be improved in the present study.

Few researchers have studied how L2 listeners use their L1 to take notes. Koren's (1997) study discovered that using L1 to take notes while listening to L2 audio materials could benefit some L2 learners. Based on Carrell's (2007) note-coding method, the present study will add the note-coding methods proposed by Koren (1997)–the number of words in L1 and number of characters in L1–so as to find the differences in notes taken by L2 learners from different L1 backgrounds.

The study will address the following four research questions:

1) What are the differences in advanced and intermediate learners' self-reports of listening strategies used to recall information?

2) What are the differences between Japanese and Chinese listeners' self-reports of listening strategies used to recall information?

3) What are the differences in notes taken by participants at different language proficiency levels?

4) What are the differences in notes taken by Japanese and Chinese learners of English?

1.2 Definition of Key Terms

1.2.1 Listening Comprehension Strategies

Language learning strategies, which consist of metacognitive, cognitive, and socio-affective strategies, are used by L2 learners consciously and deliberately to compensate for unknown information in the process of acquiring a foreign language (O'Malley & Chamot, 1990). Specific listening comprehension strategies are included amongst the three learning strategies, and listening comprehension strategies, which also include metacognitive, cognitive, and socio-affective strategies, are consciously used by L2 learners to overcome difficulties in audio materials (Vandergrift, 1997). Vandergrift proposed that by using metacognitive strategies, L2 learners can monitor their listening comprehension process, while, by using cognitive strategies, they can make inferences, summarize audio information, translate what they have heard into their L1, and take notes. Socio-affective strategy can be used by L2 learners to lower their anxiety when processing audio materials in the target language (Vandergrift, 2007). The researcher chose to use Vandergrift's (2007) listening comprehension strategies because they are easy for L2 learners to understand.

1.2.2 Working Memory Capacity

Working memory capacity could be defined as the ability to actively retain information (Baddeley, 2007; Conway & Engle, 1994). Baddeley (2007) concluded that there are three different components of working memory capacity: a central executive

and two sub-systems used to maintain information (the phonological loop and the visuospatial sketch pad). The phonological loop is used to maintain verbal information, while the visuospatial sketch pad is used to store visual information. Unlike short-term memory, which could be defined as a cognitive system for memorizing events and information temporarily (Cowan, 2008), working memory capacity has more functions, such as processing, maintaining, coordinating, and retrieving information.

Distinguishing working memory capacity and short-term memory is far from easy, as they are both related to temporary storage, since there are many similarities between these two terms. Previous studies have not made a clear distinction between short-term memory and working memory capacity. Cowan (2008) maintained that an effective method to distinguish between the two concepts is to specify the different activities involved in them, respectively. A feasible solution to differentiate between them might be to clarify both short-time memory and working memory tasks from the perspectives of duration and the processing load. From my perspective, short-time memory is more relevant to storing information; however, working memory capacity involves storing and retrieving information and using the information to complete various cognitive tasks, including L2 listening and reading comprehension tasks. Thus, the present study considers working memory capacity when it refers to learners' memory.

1.2.3 Recall Information Processed Using Listening Comprehension Strategies

Recall is an important element in working memory capacity (Goo, 2010). After pro-

cessing audio information, listeners may recall the information they have heard in order to complete cognitive tasks. Different from using listening comprehension strategies for the sake of understanding the ongoing lecture, which occurs during the playing of audio materials, recalling the content processed using listening comprehension strategies occurs after audio materials have finished playing.

1.2.4 Note-taking

It is common for both L1 speakers and L2 learners to write down important information while listening to academic lectures. They may write detailed information, the gist, and content after discourse markers. To save time and write more information, note-takers may use symbols, abbreviations, and numbers to take notes. This process helps them retain information, and they may refer to what they have written to stimulate recall of information (Koren, 1997).

1.2.5 Test-answerability

As an essential element for evaluating the quality of notes, test-answerability could be defined as the number of questions that can be answered using listeners' notes. Test-answerability is also highly correlated to the number of listening comprehension questions (Dunkel, 1988). For instance, in order to answer the fourth question of the first lecture correctly in the present study (see Appendix A), a note taker needed to write "projections" and "texture," or synonyms thereof. If so, he or she would earn one point. In the present study, there were 15 important points that could be used to an-

swer the corresponding listening comprehension tasks. If a note taker wrote 6 points, his answerability was calculated as 6/15, so his or her answerability was 0.4 (40%). Test-answerability differs from efficiency ratio, another key element for evaluating the quality of notes.

1.2.6 Dictogloss

Dictogloss is a technique used for teaching grammatical structures. Learners form small groups, listen to a short text, take notes, and reconstruct the passage by discussing their notes amongst themselves. These activities help learners to focus on the structures while providing a communicative environment for L2 learning (Richards & Schmidt, 2009).

1.3 Structure of the Thesis

The remaining chapters will be organized as follows. In Chapter 2, the researcher presents the theoretical foundation of the study. In this chapter, the researcher reviews the categorization of listening comprehension strategies, the effects of using listening comprehension strategies, the use of listening comprehension strategies to facilitate recall, how students from different L1 backgrounds use listening comprehension strategies, the criteria for evaluating the quality of notes, and the differences in the notes taken by L1 speakers and L2 learners.

In the third chapter, the researcher discusses the design and procedure of the study, in addition to the participants, instruments, and materials. Next, the findings are reported in Chapter 4. In Chapter 5, the researcher discusses the findings. In Chapter

6, the researcher presents a summary of the findings, which will be followed by a discussion of the limitations of the study, as well as its pedagogical implications.

Chapter 2: Literature Review

This section will examine language proficiency level and L1 background as two crucial factors that affect the use of listening comprehension strategies to facilitate recall. First, a brief introduction to the L2 listening comprehension process, the knowledge required to understand L2 audio materials, the difficulties faced by L2 listeners, the skills required to understand academic lectures, and factors affecting listening comprehension strategies will be provided. Later, the relationship between working memory capacity and listening comprehension will be discussed. By reviewing previous studies on recall, the researcher aims to illustrate the gaps that exist in the field of second language acquisition.

After introducing the use of listening comprehension strategies to facilitate recall, the researcher will elaborate on previous studies on the characteristics of the TOEFL listening comprehension subtest, criteria for evaluating note quality, and the differences in notes taken by L1 speakers and L2 learners. Following this, the gaps in previous studies will be revealed, and the researcher will present the research questions of the study.

2.1 Nature of Listening Comprehension

2.1.1 Studies on the Process of Listening Comprehension

Compared with hearing, which can be defined as the precursor of listening, listening is a conscious and deliberate process that requires interaction between attention com-

petency, effort, and self-regulation (Schneider & Shiffrin, 1977). The process of comprehending audio materials can be completed and facilitated using different factors, including contextual information, occasion, and paralinguistic features. Furthermore, listening requires that information from different sources, internal or external, be comprehended.

There are four steps involved in the process of listening comprehension: selecting, organizing, integrating, and monitoring information (Wolvin, 2010). Selecting information, as the initial step in the listening process, requires listeners to identify and categorize the audio stimuli they hear. Listeners must distinguish acoustic information from the environment. For instance, they need to differentiate important audio information spoken by the people around them from the sounds made by other objects. This step should be completed rapidly as important acoustic information may quickly be covered by noise (Oden *et al*., 1991).

In addition, listeners must distinguish language from non-language audio signals. Anderson (2004) concluded that listeners may or may not pay attention to the audio stimuli that reach the sensory area and send them for further comprehension. They must then distinguish language signals from non-language signals by identifying the acoustic features of language signals, such as frequency, pitch, and rhythm.

Next, listeners can utilize their previous phonetic knowledge to identify and categorize the audio stimuli they have heard. During this procedure, listeners also need to identify and adapt to variations in the structure of speech (Norris *et al.*, 2003). Warren (1970) discovered that listeners could repair incomplete sound structures. Finally, listening, to some extent, is also related to other modalities, such as vision and touch experiences. Listeners are required to process the above-mentioned non-audio information while observing gestures or facial expressions.

At the stage of organizing information, listeners are required to identify meaningful units, and these units are organized into a representation of the text base (Wolvin, 2010). Culter (2012) claimed that listeners are required to convert acoustic information into meaningful units using their mental lexicon. Due to the fact that spoken language does not feature spaces between different linguistic levels, such as words and sentences, listeners must also divide acoustic information using prosodic features such as rising and falling tones, pauses, and stresses (Inhoff & Connine, 1995).

According to Wolvin (2010), listeners need to process sentences by ascertaining the agent and action of a sentence, and listeners' prior knowledge and the context may also facilitate the process of sentence processing. Working memory capacity is then essential to organize information, as listeners are required to process a number of meaningful units simultaneously. Baddeley (2007) suggested that there are two crucial elements in working memory capacity, including the phonological loop and the central executive function, and that the two elements are essential to monitor comprehension and organize the meaningful acoustic information in a logical way. Finally, to gain a full understanding of the input, listeners should construct the meaningful sentences they have heard into a text.

After organizing the input into a text, listeners should integrate the information they have heard. Making inferences is the most significant element at this stage. Making inferences can be defined as a kind of cognitive process by which listeners can create new information by utilizing prior knowledge, existing knowledge, and incoming information (Ashcraft, 2006). Inferences can be classified into three categories: semantic, bridging, and elaborative inferences (Wolvin, 2010). Semantic inferences, which are related to linguistic knowledge, serve to complete the structure of an utterance. Listeners may also need to make bridging inferences when they need to ascer-

tain the links between sentences to create a coherent story. Listeners' prior knowledge is critical for them to make elaborative inferences, because their prior knowledge can be used to infer the gaps in texts.

At the final stage of listening comprehension, listeners should monitor structure building. According to Wolvin (2010), language comprehension can be regarded as a structure building that requires a combination of incoming information and prior knowledge. During the structure building process, listeners are required to monitor their comprehension. As listeners need to process more incoming information, the structure building process is more challenging, which makes the role of monitoring important.

On the other hand, Anderson (2004) proposed a different version of the language comprehension process. According to Anderson (2004), a comprehensive language comprehension process consists of three highly related stages, which are the perceptual stage, the parsing stage, and the utilization stage. This process can be used to understand both reading and listening comprehension. In the perceptual stage, listeners need to decode the incoming audio information while distinguishing and dissecting phonemes from the speech. At this stage, listeners pay close attention to the input, as they have to distinguish different linguistic levels, such as sounds, words, and sentences (Anderson, 2004). Some other aspects of the task, including pauses and tones, are also of great importance at this stage. According to O'Malley and Chamot (1990), listening comprehension strategies, like selective attention and directive attention, are prominent during this process. In parsing, higher linguistic and cognitive abilities are required. Listeners can construct separated information, such as words and phrases, into a meaningful, sequential, and even dynamic frame. Listeners' prior knowledge and linguistic knowledge can help them construct a layer that is higher

than the superficial surface (Anderson, 2004). During the course of information construction, making inferences is indispensable, as there are gaps between the explicit meaning of sentences. At this stage, listeners tend to give priority to phrases. According to Anderson (2004), when people try to combine individual acoustic signals into a larger layer, they focus on phrases. In utilization, prior knowledge in a listener's long-term memory and the parsed information are combined, as listeners need to fulfill various listening comprehension tasks (Goo, 2010). The knowledge in the long-term memory could be regarded as the schema by which some proficient foreign language listeners make inferences (Goo, 2010). The above-mentioned three stages are interrelated (Anderson, 2004). The listening comprehension process cannot be considered an isolated one-way process, but is, rather, an active and dynamic process. In conclusion, the listening comprehension process is a dynamic and interactive process during which listeners must decode information, make inferences, and construct meaning. When faced with difficulties, listeners must adopt various listening comprehension strategies to facilitate the process of comprehension.

2.1.2 Studies on the Characteristics of Lecture Comprehension

The present study investigates how L2 learners use listening comprehension strategies to recall information while listening to academic lectures. Studying how lectures are comprehended is of great practical significance, as the comprehension process enlightens L2 learners of English regarding how to understand lectures effectively and grasp key information (Weir, 1990). As lectures have their own characteristics, gaining a better understanding of them may facilitate second language learners' compre-

hension. In addition, EFL teachers also need to understand how to optimize their modes of expression so as to help L2 learners understand their lectures. Although most previous studies have focused on how to understand reading materials in the target language, these findings can also be applied to comprehending audio materials in the target language (Anderson, 1985). Richard (1983) paid specific attention to how to understand academic lectures, and first distinguished the differences between conversational listening and lecture listening. These two different types of listening task require different types of listening comprehension strategy. Richard (1983) proposed that background knowledge and prior knowledge are crucial for understanding lectures. Without the support of background knowledge, even advanced L2 listeners' performance is negatively affected. For instance, advanced L2 learners of English majoring in arts subjects often find it difficult to comprehend the science academic lectures used in the TOEFL listening comprehension section. Secondly, Sperber and Wilson (1986) suggested that L2 listeners should be capable of distinguishing important information from unimportant information; for instance, digressions and jokes should be ignored by L2 listeners. In the scenario of taking the TOEFL listening comprehension test, test takers need to take notes while listening to academic lectures. Obviously, they cannot write down all they hear in their notes, so extracting important information is highly recommended.

During the process of understanding lectures, L2 listeners are required to gain a deep understanding of how lecturers deliver lectures. Firstly, different styles of lecture are featured, as lecturers deliver lectures in their own way. Dudley-Evans and Johns (1981) concluded that there are three different lecturing modes: "reading style," "conversational style," and "rhetorical style." "Reading style" means a lecturer delivers his or her lecture by reading aloud the notes he or she has prepared in advance; "conver-

sational style" means that the lecturer speaks informally, with or without referring to notes; "rhetorical style" means that the lecturer regards him or herself as a performer and uses a wide variety of tones and digressions.

Understanding the structure of lectures enables listeners to understand the lectures better and enlightens lecturers on how to organize their lectures effectively (Flowerdew, 1994). Although lectures are monologues, lecturers can still make them interactive. Murphy and Candlin (1979) concluded that there are different elements in lectures:

- marker: *Well. Right. Now*. *Let me.*
- starter: *Let's start our today's discussion on*
- informative: *Octopuses have three adaptions to help themselves survive in the harsh environment.*
- metastatement: *I want to mention two types of generator.*
- conclusion: *so we have discussed three important reasons contributing to…*

With the help of these markers, listeners can understand the structure of lectures and distinguish important information from unimportant information.

Furthermore, lectures feature interpersonal characteristics. In other words, lecturers should relate to their audiences. For instance, when a lecturer aims to introduce the definition of a term, he or she should deliver the definition in a way that makes the interaction between lecturer and audience effective and successful (Flowerdew, 1994). Rounds (1987) made the following suggestions regarding how lecturers could make their lectures interactive:

- elaborating on the content of a lecture in advance
- marking the main points in a lecture
- using linking words to make a lecture cohesive and well-structured

- marking topic change explicitly
- letting students know what they should do
- asking questions appropriately
- using persuasive techniques

Based on the above analysis, it can be perceived that academic lectures have unique characteristics. L2 learners may use different listening comprehension strategies to process academic lectures and facilitate recall. However, the most effective listening comprehension strategies for facilitating L2 learners' recall are yet to be identified. In this study, the researcher aims to fill this gap to enhance L2 listeners' study efficiency.

2.1.3 Knowledge Required in Lecture Comprehension

Although there are a number of similarities between listening and reading comprehension processes, major differences can still be perceived. Buck (2001) claimed that listeners deal with speech that is in the form of sound, that listeners cannot review what they have heard as the speech is encoded in a linear sequence, and that the language style in audio materials differs from written language. Based on the distinctive features mentioned above, listeners need to acquire knowledge that differs from understanding written materials to facilitate their lecture comprehension.

Firstly, listeners should acquire adequate linguistic knowledge (Vandergrift, 2007). Hu (2002) concluded that listeners should combine knowledge from different sources to complete their lecture comprehension: phonetic, such as phonological, lexical, syntactic, and pragmatic knowledge. Listeners should integrate both linguistic

and non-linguistic knowledge to comprehend incoming audio information. Listeners should have adequate knowledge to understand the phonological, lexical, syntactic, and pragmatic features of a lecture. As for pragmatics, listeners should have illocutionary and sociolinguistic competencies (Bachman, 1990).

Furthermore, listeners are required to refer to their background knowledge to understand a lecture. Vandergrift (2007) suggested that L2 listeners, to some extent, can use their background knowledge to help them comprehend those parts they cannot understand. This process is more relevant to top-down listening style, which means using prior knowledge to understand the gist of a lecture.

Lastly, listeners should utilize their situational knowledge. This involves the use of paralinguistic features and contexts to facilitate listeners' lecture comprehension. For instance, in order to understand the meaning of a polysemant, L2 listeners should make full use of the context to extract its precise meaning.

2.1.4 Studies on the Second Language Listening Comprehension Process

In this section, the researcher will elucidate the differences between first language comprehension and second language comprehension. There are some similarities between the two listening comprehension processes. For example, both L1 speakers and L2 listeners are easily distracted from the incoming audio information (Buck, 2001). In addition, both first and second language comprehension processes require listeners to utilize linguistic knowledge. Both groups of listeners should utilize various listening comprehension strategies to facilitate their listening comprehension process.

However, there are two distinctions between first and second language listening comprehension. A salient difference lies in the fact that foreign language listeners

have a limited knowledge of the target language, while native speakers' listening comprehension problems are related to lack of attention or interest (Buck, 2001). Furthermore, L2 listeners may not be familiar with the cultural background of a target language, which could lead to misunderstandings in second language listening comprehension (Rost, 2002). In addition, L2 listeners lack related background knowledge to help them understand special expressions and slang in second language listening comprehension materials (Rost, 2002).

Furthermore, individuals acquire their first language automatically; in other words, they learn their first language quickly and unconsciously as they are always in their first language environments. Conversely, for second language learners, although they may make efforts to acquire a great deal of linguistic knowledge regarding their target languages, they may still encounter difficulties in comprehending audio materials in the target languages. L2 learners will never acquire a foreign language as proficiently as their mother tongue (Buck, 2001). L2 learners at different foreign language proficiency levels perform differently in their second language listening comprehension process. Less proficient L2 learners can only understand some words or phrases when dealing with difficult audio listening comprehension materials in the target language. Proficient L2 learners can process audio information in the target language quickly, while weaker L2 learners must spend a great deal of time processing the information and perform less satisfactorily (Buck, 2001).

Although input serves as an important part of second-language acquisition, the amount of input required for a second-language learner to acquire a foreign language has not yet been established (Rost, 2002). Vandergrift (1997) proposed that the difference between successful and less successful acquirers lies in their ability to use listening as a method of acquisition. Rost (2002) concluded that phonological processing,

lexical processing, syntactic processing, and learning context are indispensable in successful L2 listening development. Firstly, when processing phonological and lexical information, successful L2 listeners are adept at using lexical segmentation strategies to identify the onset of a new content word, so they can separate the information chunks in L2 audio materials correctly (Rost, 2002). Furthermore, under most circumstances, for L2 learners, learning to comprehend spoken information and learning the syntax and lexis of the target language through listening do not occur simultaneously. L2 listeners must find a means of access to a grammatical-building model so as to improve their syntactic processing ability efficiently (van Patten, 1996).

A number of researchers have concluded that different factors contribute to failure in L2 listening comprehension (Gardner & MacIntyre, 1992; Dörnyei, 2001; Ellis, 1994; Singleton, 1995). Cognitive factors, such as intelligence, language learning attitude, and the use of language learning strategies are correlated with the listening comprehension performances of L2 learners (Gardner & MacIntyre, 1992; Dörnyei, 2001). Singleton (1995) suggested that environmental factors, including timing of instruction and teaching methodology, could exert an influence on the performance of L2 learners. Ellis (1994) proposed that affective factors, such as learning anxiety and motivation, could contribute to the success or failure of L2 listening comprehension. Learners initiate their second language acquisition process to gain an international perspective or communicate with people from exotic lands. Few, however, can achieve their goal of learning a second language. By studying L2 learners at high language proficiency level, it can be substantiated that creating an optimal learning environment and adopting effective teaching methodologies are significant.

As mentioned above, L2 listeners may face various difficulties in the second language listening comprehension process. In addition, they have inadequate linguis-

tic knowledge of the target language, and lack related background knowledge. Under such circumstances, it is not uncommon for them to utilize various listening comprehension strategies to help them comprehend L2 listening comprehension materials. The usage of strategies is crucial in the second language listening comprehension process. In the following section, the researcher will review listening comprehension strategies.

2.2 Studies on Listening Comprehension Strategies

2.2.1 Studies on the Factors Affecting the Use of L2 Learning Strategies

According to Willing (1988), learning strategy can be defined as an internal mental process for gathering, processing, combining, classifying, and retrieving information. L2 learners can be trained to acquire and utilize various learning strategies, while making full use of those learning strategies can facilitate their second language learning (Chang, 2008). Therefore, gaining a deep understanding of language learning strategies is quite important for L2 learners to enhance their L2 language proficiency.

A number of scholars have proposed different versions of the categorization of learning strategies. Oxford (1990) concluded that L2 learners are inclined to adopt five effective language learning strategies: compensation, metacognitive, cognitive, social, and affective strategies. Firstly, compensation strategies, as proposed by Oxford (1990), mean that foreign language learners use their past linguistic knowledge and the clues in the listening material to understand difficult words. To achieve this goal, students' previous pronunciation and grammatical knowledge is crucial. Furthermore, compensation strategies also encompass the use of pronunciation

knowledge to infer the social status and identity of the speakers in listening materials. Language learners can utilize compensation strategies to make further implications and inferences. Secondly, Bacon (1992) and O'Malley *et al*. (1989) suggested that cognitive strategies are those most frequently used by language learners. Bacon (1992) categorized them under two listening styles: the top-down and bottom-up styles. According to him, the bottom-up strategy refers to the use of clues or evidence in audio transcripts to understand new information. L2 learners tend to divide a passage into different meaningful groups, and try to understand the basic meaning by comprehending linguistic cues. Furthermore, the top-down strategy relates to listeners' personal knowledge, which is "Schemata knowledge." Schema knowledge means prior knowledge. By referring to this knowledge, L2 learners might be competent in using the main idea of a passage to understand the details of the passage. According to Bacon (1992), language learners are inclined to rely on the bottom-up style to process difficult audio information, while they are likely to use the top-down strategy to deal with a less difficult text. Thirdly, according to Oxford (1990), metacognitive strategies, which can be categorized as indirect language learning strategies, consist of identifying the purpose, self-monitoring, and self-evaluation. Fourthly, social strategies refer to language learners' ability to be grouped together to discuss their difficulties in the process of language learning. For instance, they could discuss their understanding of the listening comprehension materials that they have heard, through which their listening competency can also be enhanced (Oxford, 1990). Affective strategies refer to the affective side of a foreign language learner (Oxford, 1990). The use of affective strategies is crucial as the emotions, attitudes, and values of test takers can affect listeners' performance in the listening comprehension test (Oxford, 1990). O'Malley and Chamot (1990) identified three primary learning strategies: metacogni-

tive, cognitive, and affective strategies. Although there are numerous learning strategies, the cultural factor is crucial; in other words, L2 learners from different cultural backgrounds favor different language learning strategies (Reid, 1987). According to Flowerdew and Miller (2005), there are other factors that could affect how L2 learners adopt different learning strategies.

Table 2.1

Factors Affecting the Use of Learning Strategies

Factor	Explanation
Target language	Teachers of foreign languages may use different methods to teach their languages, which would affect learners' use of learning strategies.
Proficiency level	Compared to learners at low language proficiency levels, high-level foreign language learners may use more meta-cognitive learning strategies.
Knowledge about self	Knowledge about one's personality also exerts an influence on the use of language learning strategies.
Gender	Female learners may use more learning strategies.
Motivation	Language learners who are highly motivated use more learning strategies.
Learning style	Learning strategies vary in the learning styles chosen by different language learners.

Career orientation	People who engage in language related careers may adopt more language learning strategies.
Teaching methodology	How language teachers teach affects the acquisition and utilization of learning strategies.
Task requirement	Different assignments may require learners to adopt variable strategies. For instance, group projects may require more socio strategies.

L2 listening comprehension competency is important for L2 learners. As mentioned above, processing audio materials in the target language is different from comprehending written materials (Rost, 2002). When L2 learners initiate their second language learning process, they need to adopt a number of strategies that are more relevant to the L2 listening comprehension process (Vandergrift, 2007). Based on O'Malley and Chamot's (1990) learning strategy proposal, Vandergrift (1997) derived three types of listening comprehension strategy for L2 listening comprehension.

2.2.2 Taxonomy of Listening Comprehension Strategies

Vandergrift (1997) proposed a more detailed version to classify listening comprehension strategies, in which the three primary strategies are metacognitive, cognitive, and affective. These three strategies can be further divided into various tactics. Specifically, metacognitive strategy consists of organization, monitoring, and evaluation tactics.

Cognitive strategy consists of inference, elaboration, summarization, translation, repetition, resourcing, grouping, note-taking, deduction, and substitution tactics. Finally, socio-affective strategy consists of lowering anxiety and discussing difficulties with peers. Listening comprehension should be regarded as an automatic process (Buck, 2001), and it can be either one-way directional or bi-directional (Vandergrift, 2007). When chatting with someone, L2 listeners could play the role of either a listener or a speaker. When L2 learners take a TOEFL listening comprehension subtest, they play the role of a listener only. In order to conquer difficulties in audio materials, it is necessary for them to adopt different listening comprehension strategies.

Table 2.2

Vandergrift's Classification of Metacognitive Listening Strategies

Metacognitive Strategies		
Strategy	Focus on the learner	Focus on the Teacher
Advanced organization	Predict the purpose of a listening task.	Write a topic on the blackboard.
Directed attention	Listeners should understand the gist of a specific listening task.	Ask learners what information they tend to focus on.
Selective attention	Learners should pay attention to details.	Ask listeners some detailed questions before they listen for a second time.
Self-management	Listeners should motivate themselves to listen to a lis-	Before listening to a task, teachers can chat with

	tening task.	students in the target language, so students can prepare themselves for the task.
Comprehension monitoring	Checking L2 listeners' understanding.	Teachers can assign learners to listen to part of a lecture; therefore, listeners can generally understand the lecture.
Auditory monitoring	Listeners are aware of when something sounds right or wrong.	Teachers ask listeners to use their mother tongue to establish their understanding of audio materials.
Performance evaluation	Learners can judge their performances.	Teachers can use guidelines to teach learners how to evaluate their own performance.
Problem identification	Learners should figure out the problems causing their failures in understanding audio information.	After finishing a task, teachers can ask students to analyze their difficulties.

Table 2.3

Vandergrift's Classification of Cognitive Listening Strategies

Cognitive Strategies		
Strategy	Focus on the learner	Focus on the teacher
Linguistic inference	Speculating on the meaning of difficult words	Before starting tasks, teachers can write some difficult words on the board and ask students to speculate on their meanings.
Voice inference	Guessing by the tone of speakers. (O'Malley & Chamot, 1990)	Teachers can ask learners to focus on how the task is said.
Paralinguistic inference	Guessing the meaning of unknown words by referring to paralinguistic clues	Teachers can discuss with learners how to use paralinguistic features to facilitate their understanding.
Extra-linguistic inference	Guessing based on the requirements of a task.	Teachers can write some specific questions on the board to attract students' attention.
Inference between parts	Making use of words in the text to infer implications between parts.	Students should know that the information at the beginning of a text can be used to deduce later parts of the text.
Personal elaboration	Learners use their personal experience to facilitate their L2 listening	Teachers can ask students to discuss their prior knowledge of the topic.

	comprehension.	
World elaboration	Learners can use their world knowledge to understand the task.	Teachers can stimulate learners to recall their background knowledge related to the topic.
Academic elaboration	Learners can use their academic knowledge to facilitate their understanding.	Teachers can teach learners relevant academic knowledge.
Questioning elaboration	Learners can question themselves about what they know about this topic.	Teachers can arrange brainstorming sessions.
Creative elaboration	Learners endeavor to make the story more interesting.	Teachers can provide different endings to a story to students before displaying the real ending.
Imagery	Learners can imagine the plot of an article.	Teachers can ask learners to close their eyes to imagine the plot of an article.
Summation	Learners make a mental summary of an article.	Teachers can ask learners to introduce their mental summaries to each other.
Translation	Learners translate what they have heard into their mother tongue	Teachers can ask learners to translate what they have heard into their L1.

Transfer	Learners use prior knowledge to facilitate their listening comprehension.	Teachers can ask students to focus on key words.
Repetition	Learners should repeat some key words from audio materials.	Teachers should arrange shadow tasks in ordinary listening comprehension class.
Resourcing	Listeners use any available resources or instruments to facilitate their understanding.	Teachers should attract listeners' attention to artifacts that can facilitate their understanding.
Grouping	Listeners classify and group words together according to the words' attributes.	Teachers can ask learners to classify and group words that are similar to each other.
Note-taking	Learners can take notes while listening	Teachers can teach learners how to take notes.
Substitution	Learners can use the words they know to fill in gaps during the listening comprehension process.	Teachers can ask students to provide words to compensate for gaps in audio materials.

Table 2.4

Vandergrift's Classification of Socio-affective Listening Strategies

Socio-affective Strategies		
Strategy	Focus on the Learner	Focus on the Teacher
Asking questions	Learners can ask more questions about the text.	Teachers should motivate learners to ask questions related to a text.
Cooperation	Learners work together to exchange their understanding with each other.	Teachers can classify listeners into different groups and encourage them to discuss.
Lowering anxiety	Listeners try to relax before a text is displayed.	Teachers should devise methods to make students feel relaxed.
Self-encouragement	Learners should be confident about themselves.	Teachers should set achievable targets for listeners.

2.2.3 Listening Comprehension Strategies for Understanding Lectures

In this section, the researcher aims to review specific strategies used in understanding lectures. As Aiken (1978) states, comprehending lectures is slightly different from comprehending other types of audio information. The lecture comprehension process

is an interactive and complex process, so researchers have not proposed a comprehensive model to describe what lecture comprehension is. There are two stages in the lecture comprehension process. Firstly, listeners should understand all audio information at the phonological, lexical syntactic, and pragmatic levels. At the second stage, they should use their comprehension to fulfill various communicative demands, so a number of skills are required at this stage (Aitken, 1978).

Different researchers have proposed different strategies required in the listening comprehension process from different dimensions (Aitken, 1978; Weir, 1993; Richard, 1983; Powers, 1986). Aitken (1978) proposed that the strategies involved in the listening comprehension process should be used to fulfill the communicative demands of different contexts. Aitken`s depiction of the strategies required to understand lectures focused on the aspect of cognition. The strategies include the following:

- Being able to understand the meanings of unknown words in listening comprehension materials.
- Comprehending the syntactic structure of listening comprehension materials.
- Inferring the real intention of the speaker from stressed sounds, intonation cues, and other paralinguistic features.
- Making appropriate conclusions and inferences.
- Analyzing the attitude of the speaker towards an event or object.
- Figuring out the rhetorical approaches used in listening comprehension materials.

Weir (1993, cited in Flowerdew, 2004: 12) listed four categories of strategy used for understanding lectures, which were decoding meaning, making inferences, understanding implicit meaning, and taking notes. Weir described more cognitive strategies than Aiken's (1978) proposal of the skills required to comprehend lectures. He first proposed that taking notes is highly important for L2 listening comprehension, and

proposed the following strategies (Weir, 1993).

(a) Direct meaning comprehension

- Listening for the main idea.

- Listening for the crucial information, such as statements and illustrations.

- Listening for specific details.

- Identifying a speaker's intention and attitude.

(b) Making inferences

- Making inferences and understanding implications.

- Taking social context into consideration.

- Understanding the communicative function of the audio information.

- Guessing the meaning of unknown words.

(c) Contributory meaning comprehension

- Perceiving phonetic features.

- Understanding grammatical features.

- Understanding the syntactic structure of sentences.

- Understanding cohesive methods.

(d) Taking notes

- Competency to write down crucial information.

- Competency to select key information.

Richards (1983, cited in Flowerdew, 2004: 12) suggested a more detailed version of the strategies used in the listening comprehension process. Richards (1983) summarized two different listening comprehension objectives: listening to comprehend daily conversations and listening to comprehend academic lectures:

(a) Conversational listening

- Being able to retain and store listening materials of different lengths.

- Being able to distinguish sounds in the target language.

- Being able to identify the stress patterns of words.

- Being able to recognize the rhythmic structure of listening comprehension materials.

- Being able to perceive word boundaries.

- Being able to recognize the vocabulary used in daily conversation topics.

- Being able to detect key words.

- Being able to deduce the meaning of words in specific contexts.

- Being able to recognize the syntactic patterns of sentences.

- Being able to identify cohesive devices in audio materials.

- Being able to identify elliptical forms.

- Being able to analyze sentence constituents.

- Being able to understand the communicative functions of audio information.

- Being able to infer the goals, procedures, and participants of audio information.

- Being able to use background knowledge to infer the gist of audio information.

- Being able to foresee the outcome of the story described.

- Being able to infer the connection between events.

- Being able to infer the cause and effect of events.

- Being able to distinguish between literal and applied meanings.

- Being able to reconstruct the topic of audio information.

- Being able to adapt to different speech rates.

- Being able to process audio information containing pauses and errors.

- Being able to perceive speakers' paralinguistic features.

- Being able to use various listening comprehension strategies.

(b) Lecture listening

- Being able to understand the purpose of academic lectures.

- Being able to understand how the topic of a lecture is developed.
- Being able to understand the relationship between meaning units.
- Being able to understand the role of conjunctions.
- Being able to understand causes and effects.
- Being able to understand the general meaning of specific terms.
- Being able to understand words in specific contexts.
- Being able to understand the function of intonation to signify information structure.
- Being able to infer the attitudes of speakers.
- Being familiar with different lecture styles: formal and impromptu.
- Being able to understand the function of non-verbal cues.
- Being able to acquire background information relevant to different topics.

Powers (1986, cited in Flowerdew, 2004: 13) produced another version of the strategies used in academic lecture listening. Powers asked 144 teachers what strategies were important to comprehend lectures. Based on their opinions, nine sub-strategies were regarded as important.

- Being capable of distinguishing important information units from unimportant ones.
- Being capable of figuring out the relationships between major information units.
- Being capable of identifying the topic of a lecture.
- Being capable of taking notes.
- Being capable of retrieving information from notes.
- Being capable of figuring out the relationships between information in notes.
- Being capable of comprehending terms and key words in lectures.
- Being capable of understanding the structure mode of lectures.
- Being capable of figuring out examples and supporting ideas.

The above-mentioned strategies are important for processing lectures. To en-

hance their efficiency in acquiring a foreign language, L2 learners need to ascertain the listening comprehension strategies most used by advanced L2 learners (Chang, 2008). Therefore, the present study aims to reveal the strategies most used by advanced L2 learners of English to comprehend lectures, so as to fill the above-mentioned gap.

2.2.4 How Language Proficiency Level Affects the Use of Listening Strategies

In this section, the researcher will review previous studies on how advanced L2 learners use listening comprehension strategies and reveal the gaps in these studies. As mentioned earlier, there are primarily three types of listening strategy, which are metacognitive, cognitive, and socio-affective strategies. Vandergrift (1998) suggested that the use of listening strategies is highly personal and individualized, regardless of proficiency level. On the other hand, other researchers argue that listeners at different foreign language proficiency levels might demonstrate distinctions in their use of listening strategies (Chamot *et al*., 1987; Oxford, 2014; Vogel, 1995). By studying Russian L2 learners at different levels of proficiency, Chamot *et al*. (1987) discovered that higher proficiency learners use more listening strategies than lower proficiency learners, and that higher proficiency learners could describe what listening strategies they used clearly and elaborately. Vandergrift (2003) concluded that compared with less proficient listeners, advanced listeners are more inclined to use metacognitive strategies. According to Oxford (1996), the reason why advanced listeners use more metacognitive strategies lies in the fact that these strategies help them to manage and control their learning processes. In addition, Vogel (1995) discovered that L2 beginners only focus on individual words rather than the structure of listening materials, due to

their limited linguistic knowledge.

L2 listeners at different language proficiency levels differ in their method of using listening strategies (Murphy, 1985; Chamot & Kupper, 1989; Bacon,1992; Vandergrift, 2003; Bianco & Guisado, 2012; Chang, 2008). Murphy (1985) studied how L2 listeners at different proficiency levels listen to academic lectures, and he concluded that advanced learners could process audio materials better and use various listening strategies flexibly, whereas the less advanced L2 listeners in his study could only focus on certain words in the text. Chamot and Kupper (1989) conducted in-depth research on how skilled listeners use listening strategies, and found that the skilled listeners in their study could monitor their listening comprehension processes effectively, integrate their prior knowledge into their listening comprehension processes, and make full use of the following comprehension questions to predict the topic of the listening material and make inferences. Moreover, O'Malley *et al*. (1989) studied whether L2 listeners use distinct listening strategies at different stages of the L2 listening comprehension process. As Anderson (1985) first concluded, the L2 listening comprehension process comprises the three different stages of perception, parsing, and utilization. In the first, perceptual, stage, paying attention to details might be crucial. Skilled listeners can naturally redirect to the audio materials they have heard, while less skilled listeners lose themselves once distracted (O'Malley *et al.,* 1989). Secondly, in the parsing stage, grouping and inferences proved significant, with proficient listeners able to process large chunks of the incoming audio material and make inferences. Conversely, less proficient listeners could only process information on a word-by-word basis. At the final stage, elaboration has been shown to be the most important strategy. Listeners at high proficiency level can make inferences and refer to their prior knowledge simultaneously to facilitate their listening comprehension pro-

cess (O'Malley *et al.*, 1989). Bacon (1992) also studied the differences in how listeners at different language proficiency levels use listening strategies, and claimed that the most significant distinction is that advanced listeners can use listening strategies flexibly. Vandergrift (2003) claimed that advanced listeners can use various listening strategies flexibly and effectively at the same time. Bianco and Guisado (2012) proposed that high language proficiency L2 listeners are competent at consciously utilizing listening strategies and their understanding is enhanced by their use. The listening strategies adopted by proficient and less proficient L2 listeners are nearly identical; however, listeners at different language proficiency levels demonstrate discrepancies in the frequency with which they employ listening strategies, the preferential order, and the mode of utilization (Chang, 2008).

The effects of listening comprehension training have also been verified (Vandergrift, 1997). L2 listeners who have been provided with training in the use of listening strategies might use those strategies effectively. In Vandergrift's study, the treatment group that received training in the use of listening strategies showed apparent changes in their use of listening comprehension strategies. Specifically, study participants could take notes effectively, while the control group showed little improvement in employing listening strategies.

However, a number of researchers have argued that the effect of listening comprehension strategies might be exaggerated (Vann & Abraham, 1990; Chang, 2008). Learners at different levels of proficiency actually use the same listening comprehension strategies. Therefore, their performance in listening comprehension tests may not be attributable to the use of listening comprehension strategies. Furthermore, Vann and Abraham (1990) concluded that training in the use of listening strategies cannot guarantee satisfactory performance in listening comprehension tests. Chang (2008)

found that other factors such as listening task type and anxiety level can affect the use of listening strategies.

Based on the above analysis, previous researchers have focused on how advanced L2 learners use listening comprehension strategies when they process audio information; however, how they recall the information processed using these listening comprehension strategies has seldom been studied. Thus, in the present study, the researcher aims to fill this gap.

2.2.5 Use of Listening Comprehension Strategies to Facilitate Recall

Kintsch and Yarbrough (1982) suggested that the use of listening comprehension strategies facilitates L2 listeners' audio material comprehension. By using listening comprehension strategies while processing audio information, listeners might understand the organization of a lecture, the relationship between ideas, and the rhetorical structure of the lecture. Dijk and Kintsch (1978) proposed that listeners might use listening comprehension strategies to understand the rhetorical structure of lectures, which could be classified as cause-and-effect, comparison, categorization, and procedural description. According to Dijk and Kintsch (1978), processing verbal information involves understanding and recalling information, which suggests that listeners recall the information processed using listening comprehension strategies.

According to Meyer and Freedle (1984), when trying to understand and recall incoming information, listeners need to take advantage of their working memory capacity to understand the discourse type, gist, detailed information, and rhetorical cues in a lecture.

The role of working memory has become increasingly salient in the field of se-

cond language acquisition (Vandergrift & Baker, 2015). In addition, Vandergrift and Baker argue that working memory capacity plays a pivotal role in cognitive psychology because it can be used as an important element to explain the differences in cognitive capacity between individuals. Different from short-term memory, which refers to a system for temporary storage of memory, working memory refers to the ability to store and retrieve information actively (Goo, 2010). The present study focuses on how L2 listeners recall contents in L2 audio materials. The participants were asked to process, store, and recall the contents in the two lectures used in this study, whose requirements belong to working memory capacity.

According to Goo (2010), working memory capacity consists of mechanisms that can be used to maintain information, and mechanisms that can coordinate its storage and processing functions to complete complex cognitive tasks. Working memory capacity is an integration of all the cognitive resources in one's mind, and is regarded as a model that consists of different components. In other words, working memory is a dynamic system that enables individuals to maintain task-relevant information in support of complex cognitive tasks (Kane *et al*., 2007). There are four elements in working memory capacity, including the central executive, the phonological loop, the visuo-spatial sketchpad, and the episodic buffer (Vandergrift & Baker, 2015). The central executive and phonological loop are crucial elements in working memory capacity (Revesz, 2012). According to Goo (2010), the central executive controls information storage and task-relevant behaviors such as second language listening comprehension and retrieving knowledge in the long run. Furthermore, two subsystems are also crucial in working memory capacity. The phonological loop consists of holding and recalling verbal information competencies (Revesz, 2012), while the visuo-spatial sketchpad is used to hold non-verbal information. Lastly, the fourth element in

working memory capacity is the episodic buffer, which plays the role of integrating the information from the above-mentioned three sources and transferring them into the long-term memory of individuals. Among the four elements, the central executive and phonological loop are more likely to be studied by researchers, as L2 learners' capacities are limited when they are required to complete different cognitive tasks using these two elements. As for L2 listening comprehension, L2 listeners need to process audio materials, so the central executive and phonological loop are significant because L2 listeners need to store and recall information with the help of these two elements.

When studying the influences of individual differences in cognitive capacity on L2 learning, researchers have also paid attention to the role of working memory. A number of scholars have investigated the relationship between working memory capacity and cognitive performance (Daneman & Carpenter, 1980; Call, 1985; Unsworth & Engle, 2007; Kane *et al*., 2007; Goo, 2010). For instance, Daneman and Carpenter (1980) found that readers with a more effective reading process have better working memory capacity that can be used for storage. Call (1985) concluded that memorizing a syntactically arranged word is a crucial component of proficiency in listening comprehension, which verified the role of memory working capacity in listening comprehension. On the other hand, working memory capacity also requires individuals to store information and process incoming information simultaneously (Goo, 2010). Unsworth and Engle (2007) claimed that individuals with low working memory capacity are less proficient at making inferences than those with high working memory capacity because individuals with low working memory capacity are poor at focusing on task-relevant representations and retrieving memory. In addition, L2 learners with high working memory capacity can store and process more infor-

mation compared to those with low memory capacity (Kane *et al*., 2007).

In addition, differences in working memory capacity can be used to predict whether L2 learners perform well in their L2 listening comprehension tasks (Skehan, 2002). A number of researchers have studied the relationship between working memory capacity and L2 listening comprehension (Andringa *et al*., 2012; Vandergrift, 2015). Andringa *et al*. (2012) suggested that L2 listeners with greater working memory capacity were more adept at perceiving the important cues in L2 spoken discourses and that these L2 listeners could make full use of those cues to facilitate their L2 listening comprehension processes. By studying learners of Dutch at high proficiency level, Andringa *et al*. (2012) discovered that there might be a potential relationship between working memory capacity and the L2 listening comprehension process. Furthermore, Vandergrift (1999) suggested that working memory capacity is an important variable to explain whether L2 learners can perform well in the L2 listening comprehension process.

A number of researchers have verified the relationship between working memory capacity and L2 listening comprehension capacity, but how L2 listeners use their working memory capacity to recall the audio information they have heard has not yet been researched. As mentioned above, L2 listeners are inclined to adopt different listening comprehension strategies to process the incoming audio information, so it is not uncommon for them to recall the contents processed using different listening strategies when completing the corresponding comprehension tasks. Therefore, how L2 listeners take advantage of their working memory capacity to recall information deserves to be studied intensively. However, only very few researchers have studied this issue in the past (Vogel, 1995; Liu, 2015).

Vogel (1995) concluded that learners who perceived themselves to be the most

strategic listeners outperformed those who perceived themselves to be the least strategic listeners on recall tests. Vogel also discovered that recall ability is closely associated with types of listening strategy, but he did not delve into the relationship between learners' proficiency levels and recall ability using listening comprehension strategies. How successful and less-successful listeners differ in recalling the content processed using listening comprehension strategies remains unanswered. Finding an answer to this question is one of the main objectives of the present study. Liu (2015) compared the differences between test takers of TOEFL at different language proficiency levels in recalling the contents using listening comprehension strategies. He concluded that successful listeners are more likely to recall the gist of a lecture as well as its details and then make inferences about the lecture, as compared to their less successful counterparts. Advanced listeners are also more adept at referring to their notes to stimulate recall (Liu, 2015). However, Liu's (2015) study did not distinguish between different kinds of details in the questionnaire. According to Vandergrift (1999), details can be divided into various categories, such as complete information units, single words, and repeated words. Therefore, the present study improves upon the method used in Liu's (2015) study by ameliorating the contents of the questionnaire.

Based on the above analysis, some gaps remain in the field of L2 listening comprehension. Although a number of researchers have studied how listening comprehension strategies are used by L2 learners at different language proficiency levels, few scholars have focused on how L2 learners with different foreign language proficiency levels use listening comprehension strategies to facilitate recall during the TOEFL listening comprehension test. Thus, the researcher will fill this gap in the present study.

2.3 Relationship between L1 Background and Use of Listening Comprehension Strategies

In this section, the researcher will review previous studies on how L1 background affects the use of listening comprehension strategies. The researcher will focus on how Japanese and Chinese learners of English adopt listening comprehension strategies, and reveal the gaps that exist in previous studies.

A number of researchers have investigated how L2 learners from different L1 backgrounds adopt different listening comprehension strategies (Grainger, 2012; Hu, 2000; Ding, 2007; Oxford & Burry, 1995; Hu, 2002; Oxford, 1996; Takeuchi, 2003).

First, the researcher will elaborate on how Chinese learners of English select listening comprehension strategies, which is affected by how they learn English. Chinese learners of English share similarities in terms of how they select listening comprehension strategies. Li (2014) conducted a study that aimed to reveal the beliefs held by Chinese learners of English regarding English learning. He suggested that his study samples acknowledged the role of EFL teachers, and so they were likely to follow their instructive advice. According to Hu (2002), the majority of Chinese learners of English tend to memorize the contents of their textbooks and reflect on the mistakes they have made, which furnishes them with high recall ability to retain written and oral information in the target language. This language learning method enables Chinese learners to recall audio and written information in the target language. Furthermore, due to the prevalence of the traditional grammar teaching method, Chinese learners of English are inclined to translate what they have heard into their L1; in other words, when processing audio information in the target language, Chinese learners of English are accustomed to translating the audio information into their L1 (Yu,

2001). Lastly, Chinese learners of English also tend to focus on every detail of audio materials. When they enhance their listening comprehension competency, they can use top-down and bottom-up listening models simultaneously and effectively (Hu, 2002).

However, Chinese learners of English at different language proficiency levels demonstrate differences in their use of listening comprehension strategies. Chang and Read (2013) conducted a study to ascertain whether Chinese learners of English at different language proficiency levels (high and low) perform differently in listening comprehension tests with different test formats (listening comprehension questions in written form and oral form). They found that Chinese learners of English at high proficiency level could deal with the cognitive load posed by the test in which listening comprehension questions were asked orally, as they were trained to focus on linking words, such as "but," "so," and "firstly." It is also worth noting that Chinese learners of English changed their listening comprehension strategies based on their EFL teachers' requirements (Ding, 2007). Similarly, Gao (2006) used a socio-cultural approach to study whether L2 learners changed their learning strategies and listening comprehension strategies if they moved to an exotic environment. In his study, he kept track of 14 Chinese learners of English who had moved to Britain from China and discovered that they changed from focusing on details to combining cognitive and socio-affective strategies. Similarly, Goh and Foong (1997) also posited that Chinese learners of English are inclined to use affective and social strategies. In other words, Chinese listeners tend to discuss difficulties in audio materials with their peers.

In this section, the researcher will expound on how Japanese learners of English adopt different strategies to facilitate their listening comprehension. Revesz (2012) suggested that learners' attitudes toward language learning affects how they select

their language learning strategies. Like other Asian learners of English, Japanese learners of English are required to take various standardized English tests, so they often feel stressed when learning English. Regarding the purpose of passing English examinations, they regard memorization as the most significant learning strategy, which is similar to their counterparts in China. Takeuchi (2003) also concluded that Japanese learners of English believe in the role of their teachers, and endeavor to seize every opportunity to practice their English competency and communicate with native English speakers. Furthermore, Takeuchi (2003) discovered that Japanese learners of English adopt different listening comprehension strategies at different learning stages. He also found that Japanese students are more likely to listen to English audio materials in depth at the initial stage, which means that they adopt a bottom-up listening approach when processing audio materials in English. Then, at the intermediate stage, Japanese learners of English are likely to decode audio information in English using the top-down model.

The tutorials that Japanese learners of English receive contribute to their use of listening comprehension strategies to stimulate recall. Sakai (2009) discovered that EFL teachers in Japan are accustomed to playing audio information in English to their students several times, which leads to Japanese learners of English being likely to focus on repeated information in listening comprehension materials. Focusing on repeated information is a crucial cognitive listening comprehension strategy (Vandergrift, 2007).

As mentioned above, L1 background is a crucial factor in determining how L2 learners employ listening comprehension strategies. Based on the above studies, it can be perceived that Japanese and Chinese learners of English have similarities in selecting listening comprehension strategies, such as memorizing listening comprehension

materials in the target language and focusing on the details of a lecture. However, these studies demonstrated that Japanese and Chinese learners of English also adopt different listening comprehension strategies. Japanese learners of English are inclined to focus on repeated words, while Chinese learners of English focus on linking words and adopt socio-affective listening comprehension strategies. However, less attention has been paid to studying the differences in how Japanese and Chinese learners of English recall the contents decoded using listening comprehension strategies. Thus, in view of the preceding findings and gaps, another important research question of the present research is whether there are differences between Japanese and Chinese learners of English in recalling the contents processed using listening comprehension strategies.

2.4 Note-taking in the TOEFL Listening Comprehension Test

In this section, the researcher will review the role of note-taking in the TOEFL listening comprehension test and the characteristics of the TOEFL listening comprehension test. By introducing these two aspects, readers can understand the necessity of taking notes in this test. Later, the researcher will review related studies on the differences between notes taken by L1 speakers and L2 learners. By revealing the gaps in previous studies, the researcher aims to introduce another two research questions to the present study.

2.4.1 Factors that Affect Performance on the TOEFL Listening Comprehension Test

There are two primary stages in standard L2 listening comprehension tests, which are the processing stage and response stage. Various elements existing at these two stages can affect test takers' performances. Bachman and Palmer (1996) proposed four primary factors that can exert an influence on test takers' performances:

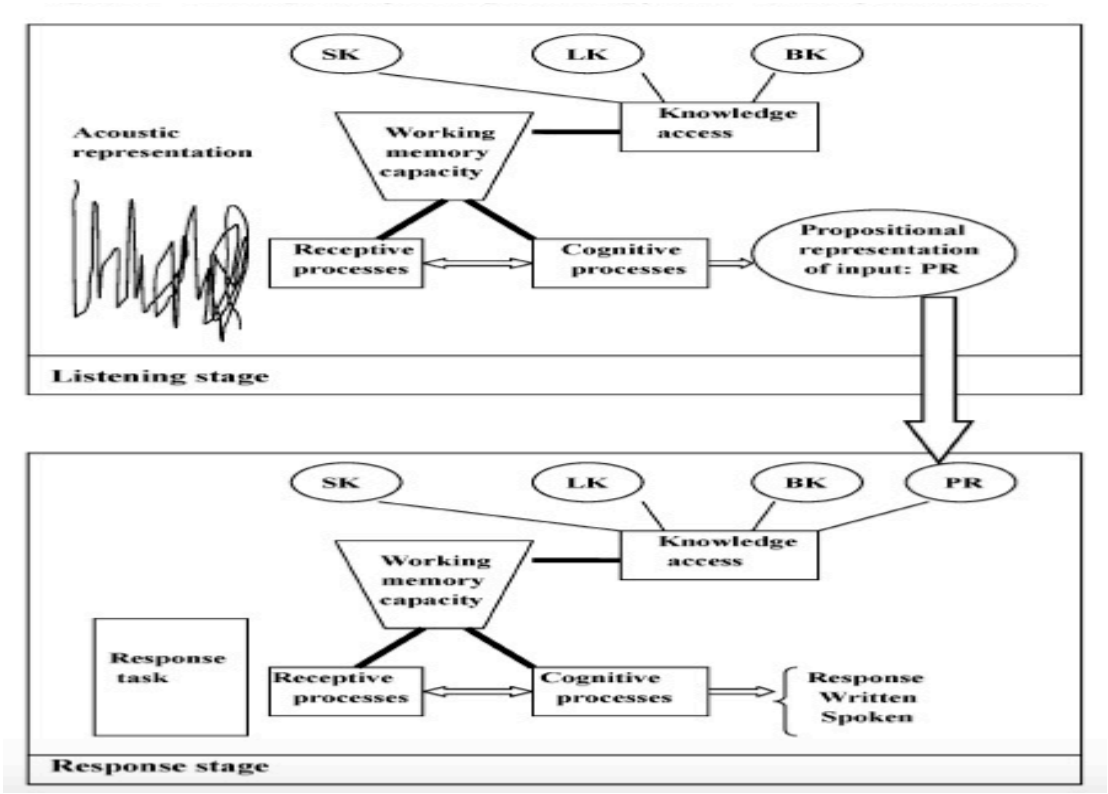
- Communicative language ability (CLA)
- Characteristics of test takers
- Characteristics of test format and method
- Unexpectedly random factors

Bachman (1990) claimed that communicative language ability is comprised of test takers' L2 language knowledge and their ability to make full use of language knowledge. According to this model, CLA could be further divided into three elements: L2 language competence, strategic capability, and psycho-physiological mechanisms.

Psycho-physiological mechanisms refer to the neurological and psychological elements responsible for the use of language. Figure 2.1 demonstrates how different sources of knowledge are involved in the process of a standard listening comprehension test.

Figure 2.1

Listening and Response Stage of Listening Comprehension Process



SK=situational knowledge LK=linguistic knowledge

BA=background knowledge PR=proposition

Test-taker characteristics are another set of factors that could affect test performance. These characteristics differ entirely from communicative language ability, as they focus on test takers' cognitive and affective characteristics. They refer to test takers' specific background knowledge, age, gender, L1 background, L2 proficiency, and educational background. These characteristics interact with each other, so test takers differ in their performances. The present study focused on two primary characteristics of the participants: L1 backgrounds and L2 proficiency levels. The researcher aims to discover how these two variables affect test takers' use of listening comprehension strategies for recall and note-taking methods.

Characteristics of test method and format refer to the following elements:

- Characteristics of the test environment
- Characteristics of the test rubric
- Characteristics of the task materials
- Characteristics of the expected responses
- Interaction between input and response

In the TOEFL listening comprehension test, the interaction between input materials and responses is crucial, as test takers must recall the input to respond to corresponding comprehension questions. During this process, recall capacity is important. According to Goo (2010), high working memory capacity enables L2 learners to deal with complex cognitive tasks, such as completing listening comprehension tasks. For this reason, the present study focused on test takers. A number of researchers have studied the characteristics of materials used in the TOEFL listening comprehension section (Nissan *et al*., 1996; Freedle & Kostin, 1993; Kostin, 2004), while the present study focused on the working memory capacity of L2 listeners. Lastly, random factors refer to unexpected events affecting test takers' scores in a listening comprehension test, such as noises (Bachman & Palmer, 1996).

2.4.2 Empirical Studies on the TOEFL Listening Test

In this section, in order to facilitate readers' understanding of the necessity of taking notes in the TOEFL listening comprehension subtest, the researcher will review the characteristics of this test. A variety of variables that could increase the difficulty of a listening comprehension test have been identified (Buck, 1990; Dunkel *et al*., 1993).

The characteristics of input, such as speech rate, material length, background knowledge, syntax, vocabulary, accent, term and density of propositional, and the traits of assessment, including test format and the availability of instructions, are two primary elements that can make a test difficult.

Test features can also make test takers feel anxious. In general, there are five types of text feature: linguistic features, explicitness, organization, content, and context.

(a) Linguistic features

- Audio materials with slower speech rate might be easier.
- Audio materials with longer pauses between information units might be easier.
- Audio materials read by lecturers with familiar pronunciation tend to be easier.
- Audio materials with fewer terms might be easier.
- Audio materials with simple grammar might be easier.
- Audio materials presented in an explicitly organized way might be easier.
- Audio materials with fewer references and implications might be easier.

(b) Explicitness

- Audio materials in which statements and gist are explicitly expressed might be easier.
- Audio materials with more repetitions tend to be easier.

(c) Organization

- Audio materials organized in a linear way might be easier.
- Audio materials with gist and statements explicitly expressed before details and examples tend to be easier.

(d) Content

- Audio materials with familiar topics might be easier.

- Audio materials with simplified contents might be easier.
- Audio materials in which relationships between different elements are clearly revealed might be easier.
- Audio materials with contents straightforwardly expressed might be easier.

(e) Context

- Audio materials with visual supports, such as pictures, tend to be easier.
- With regard to the traits of tasks, several variables are found to be factors that could affect test difficulty.
- Assignments that require decoding less information might be easier.
- Assignments that require recalling explicit details might be easier.
- Assignments that elicit information related to the main idea might be easier.
- Assignments that allow test takers to preview questions might be easier.

On the one hand, during the TOEFL listening comprehension test, L2 test takers are supposed to decode difficult texts, as numerous terms, complex grammar, and implicit statements constitute those texts. In addition, the texts are read at a fast rate, and test takers may not be familiar with the speakers' pronunciation. On the other hand, L2 test takers are not allowed to preview the corresponding comprehension questions, which may increase the test difficulty. A number of researchers have conducted empirical studies on the characteristics of the TOEFL listening comprehension test. In the following section, the researcher will elaborate on the findings and conclusions of those studies.

Nissan *et al*.'s study

Nissan *et al*. (1996) conducted research to discover the variables that contribute to the difficulty of the TOEFL listening comprehension test. However, they only fo-

cused on TOEFL dialogue items. They discovered three crucial variables that could be predictors of item difficulty. The presence of technical terms and less frequent vocabulary could contribute to item difficulty. The presence of implicit statements and inferences could contribute to item difficulty. A dialogue that ends with a statement instead of a question would be more difficult for test takers to comprehend.

Freedle and Kostin's study

In the older version of the TOEFL listening comprehension test, test takers were required to comprehend several mini lectures varying in length from 90 to 150 seconds. Based on their study of mini lectures, Freedle and Kostin (1993) proposed 12 variables that could affect item difficulty.

- When there is an overlap in the words between a lecture and incorrect options, items could be more difficult.
- When a lecture is organized in a problem solving way, items could be more difficult.
- When the topic is non-academic, items could be easier.
- When there is too much information before the crucial and necessary information, items may be more difficult.
- When more inferences need to be made, items tend to be more difficult.
- When there are more frontings in incorrect items, items tend to be easier.
- When necessary information is repeated several times, items may be easier.
- Audio materials with more topic shifts may make items easy.
- When necessary information is in the middle of a lecture, items may be more difficult.
- When there is a comparison between concepts in a lecture, items may be more difficult.

- When necessary information is located at the beginning of a lecture, items may be more difficult.
- When the topic of a lecture is related to arts or social science, items tend to be easier.

Kostin's study

Kostin (2004) proposed three levels of factors that could exert an influence on item difficulty: word-level, discourse-level, and task-processing level. Task-processing level could be defined as the interaction between the characters of a text and the features of items.

(a) Word-level factors

- A good understanding of infrequent words in a lecture enables test takers to perform better.
- A good understanding of idioms in a lecture enables test takers to perform better.

(b) Discourse-level factors

- Test takers perform better when dealing with non-academic lectures.

(c) Task-processing factors

- When there is an overlap between the words in the lecture and the words in the key option, test takers could perform better.
- When there is no overlap between the words in the lecture and the words in incorrect options, test takers could perform better.
- When test takers are required to infer the implications of a speaker, items tend to be more difficult.
- Keys that seem irrelevant to the content of the dialogue may make test takers perform worse.

Based on the above analysis, the researcher aims to propose several new factors

that increase the difficulty of the TOEFL listening comprehension test. Some new characteristics have emerged since the test was revised. In addition to comprehending the gist and details of a lecture, test takers also need to analyze the implicit relationship between information units. Furthermore, in order to understand a lecture, test takers need to ascertain what each pronoun in the lecture stands for, as, to some extent, whether test takers can perform well on the test rests on their ability to understand those pronouns.

From the perspective of test format, the TOEFL listening comprehension test does not allow test takers to preview corresponding comprehension questions and answer options, so test takers need to take notes while listening to the lectures in the test. Taking notes while listening is a complex cognitive task. It is imperative for researchers to understand how test takers take notes and how they use their notes to stimulate recall.

2.4.3 Studies on Students' Conceptualization of Note-taking

Taking notes while listening to academic lectures has become a common requirement in many standardized English proficiency tests, including the TOEFL listening comprehension test. Therefore, it is reasonable for us to gain a deep understanding of how students conceptualize the process of note-taking. Badger *et al*. (2001) answered the following research questions:

- What is the purpose of taking notes?
- What is the important information that should be written down? What are the effective strategies used to take notes?
- Do note takers refer to the notes they have taken seriously?

Listeners take notes for three primary reasons. Firstly, they need to refer to notes to recall the contents of listening materials, and notes enable them to complete the corresponding listening comprehension tasks (Badger *et al*., 2001). Secondly, in a more general sense, note-taking is of great educational significance. The participants in Badger *et al*.'s study (2011) claimed that note-taking could educate them from different perspectives.

While listening to a lecture, listeners are likely to divide audio information into different levels. In general, there are two primary levels of information in an academic lecture: the main idea level and the detail level. In addition, details may be further divided into different levels of specific information. Due to discrepancies in their language proficiency level, working memory capacity, and personality, listeners write down different levels of detail in their notes. Badger *et al*. (2011) found that listeners are all inclined to write down the gist of lectures. They also tend to write down three kinds of detail: factual details, viewpoints, and the contents after discourse markers.

With regard to note-taking strategies, the participants in Badger *et al*.'s (2011) study suggested that they mostly use abbreviations, underlining, and spacing to take notes, but they varied in terms of what they perceived as appropriate measurements to evaluate the quality of notes. After listening to a lecture, the majority of listeners reviewed their notes to help themselves retain the lecture contents. They also found that L1 speakers are more adept at reviewing their notes than L2 speakers. What is noteworthy is that few listeners claimed that their notes were useless. Based on the above analysis, L2 learners recognize the significant role of note-taking; however, the characteristics of notes taken by advanced L2 learners remains unanswered, so the present study aims to fill this gap.

2.4.4 Measurements for Evaluating the Quality of Notes

In this section, the researcher will review the criteria for evaluating notes. Later, readers may understand the characteristics of notes taken by advanced L2 learners. A number of researchers have proposed measurements for evaluating the quality of note-taking (Hartley & Davies, 1978; Norton, 1981; Nye, 1978; Dunkel, 1988; Carrell, 2007; Song, 2011). Hartley and Davies (1978) concluded that the quality of notes could be judged by three criteria: (a) the total number of words in the notes taken by listeners, (b) the total number of complete meaning groups, and (c) the number of complete meaning groups that could be used to answer questions.

Norton (1981) suggested that the number of words written down by listeners and the amount of useful information could be regarded as the key indicators of the quality of students' notes. In his study, he followed the participants for three months to demonstrate the correlation between the number of words and listeners' test scores, and he substantiated that the quantity of notes is, to some extent, connected to listeners' test scores.

Nye (1978) also showed a positive correlation between the content of L2 learners' notes and their test scores, while finding that the layout and legibility of learners' notes have no relationship with test scores.

In Dunkel's (1988) study, five measurements, the total-number-of-words score, the information-units count, the test-answerability, the completeness score, and the effective ratio, were utilized to evaluate the quality of note-taking by L1 and L2 speakers of English.

On the other hand, many researchers are inclined to divide an audio passage into different levels. Kiewra *et al*. (1995) classified lecture information into four different

levels, which were Level 1 representing the main points and Levels 2 to 4 representing subjective points. They used this classification method to judge the quality of notes taken by listeners. Inspired by this classification method, Song (2011) proposed that listeners' notes could be judged by how well they wrote down different levels of information units in an academic lecture, and in his study he also studied whether the format of notes exerted an influence on listeners' performance. He concluded that there were two primary note formats, the outline format and the blank format. These two formats can be defined as taking notes based on the gist and organization of a lecture provided by testers and taking notes in a free manner, respectively. It seems reasonable to conclude that the blank format is more authentic than the outline format in real life; however, the outline format can be an effective facilitator for listeners to complete listening comprehension tasks. Song (2011) discovered that listeners taking notes in the outline format performed better than their counterparts who took notes in the blank format.

Other researchers have also given priority to the role of the organization of notes (Cusing, 1991; Kiewra *et al*., 1995; Tsai, 2004). Cushing (1991) concluded that L2 listeners at low proficiency level could not perceive the subtle differences between the gist and details of a lecture, and could not take their notes in a logical and organized manner. In addition, L2 listeners who take notes in the outline format perform better in listening comprehension tests, and the outline format is closely related to test performance (Kiewra *et al*., 1995). The outline format can be an important predictor of L2 listener performance (Tsai, 2004).

Lastly, Carrell (2007) proposed how the quality of notes taken to complete the TOEFL listening comprehension tasks should be evaluated. Test takers must take notes quickly, as the speech rate of the audio materials used in the TOEFL listening

comprehension test is relatively fast. Thus, note takers can hardly write complete meaningful units in their notes (Carrell, 2007). In his study, he used three main criteria to evaluate the quality of the notes taken by participants: (a) total number of content words, (b) total number of notations, such as abbreviations, symbols, outlining, arrows, and circles, and (c) total number of test questions answerable from idea units found in the notes. The third criterion was the same as the answerability proposed by Dunkel (1988). Carrell's (2007) study aimed at analyzing the relationship between note-taking strategies and performance on the TOEFL listening comprehension test, so the evaluation criteria proposed by Carrell (2007) were more suitable for the present study, which also aimed to compare distinctions in the notes taken by TOEFL test takers from different L1 backgrounds.

2.4.5 How the Quality of Notes Taken by L1 Speakers and L2 Learners Relates to Their Listening Comprehension Performance

In this section, the researcher will review previous studies on the differences in notes taken by L1 speakers and L2 learners, and gaps in the studies will be demonstrated. According to Dunkel and Davy (1989), taking notes enables listeners to store and maintain audio information for a time. Both L1 speakers and L2 learners of English must take notes when they process audio materials in English. The relationship between note-taking quality and listeners' performance on academic listening tests is uncontroversial. Carrell (2007) concluded that listeners who were adept at taking notes could perform better in different tests, such as the test of general interpretation, the test of recalling details, and the test of recognizing conclusions, than poor note takers. Badger *et al*. (2001) discovered that subjects who were allowed to refer to their

notes to complete corresponding listening comprehension tasks outperformed those who were not given that opportunity.

Furthermore, Locke (1977) demonstrated that the completeness of notes is positively correlated to listeners' final scores. From his perspective, completeness of notes referred to the percentage of total information units that note takers could write down. Listeners who could take comprehensive notes were likely to answer more post-lecture comprehension questions correctly (Locke, 1997). Finally, Chaudron *et al*. (1988) verified the facilitative role of note-taking in the process of the listening comprehension process.

Based on the above findings, the role of note-taking while listening to lectures is significant. Note-taking, as a useful listening comprehension strategy, is appealing to L1 speakers, L2 learners, and researchers. In Dunkel and Davy's (1989) study, they also discovered that 92% of L1 participants and 94% of L2 participants regarded note-taking as a crucial activity. The ability to take notes plays an essential role in the L2 listening comprehension process, and a proportion of L2 listeners even complain that they would feel anxious and uncomfortable if they were not allowed to take notes while listening to audio materials. Therefore, a growing number of researchers have focused on the relationship between the quality of notes and listeners' test performance.

A few researchers have also paid attention to the cultural aspects of note-taking. They focused on the quality of the notes taken by L1 speakers and L2 learners from different L1 backgrounds and the relationship between their note-quality and their listening comprehension performance. The following studies compared the differences in the notes taken by L1 speakers and L2 learners.

Dunkel (1988) studied how the quality of notes taken by L2 learners is related

to their test performance. In this study, Dunkel used a lecture that lasted 23 minutes, and the L2 learners from different L1 cultural backgrounds were asked to take notes during the lecture. Five criteria, the total-number-of-words score, information-units count, test-answerability, completeness score, and effective ratio, were used to evaluate the quality of their notes. Dunkel (1988) discovered: (a) total number of words and information units could be predictors of L2 learners' test performance; (b) the quality of notes taken by L2 learners could affect their listening comprehension test performance; and (c) the information units count and total number of words could be predictors of L1 speakers' listening comprehension test performance.

In a study conducted by Faraco *et al*. (2002), the participants consisted of three groups: native speakers of French, advanced learners of French, and intermediate learners of French, who were allowed to take notes while listening to a 12-minute lecture. The participants' notes were then evaluated according to four criteria: (a) total number of words; (b) total number of abbreviations; (c) total number of information units; and (d) total number of reformulations. In this study, all the participants' note scores were positively related to the number of abbreviations, but the number of reformulations was negatively related to the performance of participants. It could be concluded that taking notes by reformulating the lecturer's original words is not advisable because this method might aggravate note-takers' cognitive loads. Admittedly, this study regarded the variable of L1 background as important; however, the study did not compare the quality of notes taken by L2 learners of English at different language proficiency levels.

Some researchers have only focused on the relationship between the quality of notes taken by L2 learners from different L1 backgrounds and their test performance, separately (Chaudron *et al*., 1988; Cushing, 1993; Carrell *et al*., 2004).

Chaudron *et al*. (1988) adopted many quantitative and qualitative methods to investigate the relationship between L2 learners' notes and their performance on multiple choice and cloze comprehension tests, and discovered that three measurements in L2 learners' notes–the numbers of symbols, abbreviations, and words–could be predictors of their performance on multiple-choice test scores. Cushing (1993) studied the differences in the notes taken by L2 learners, using their language proficiency and academic status as dependent variables. Cushing (1993) suggested that L2 learners' language proficiency levels and academic status could exert an influence on their test performance and that notes containing the most crucial information in the least words could be regarded as high quality. Similarly, Carrell *et al*. (2004) found that the test performance of L2 learners from different L1 backgrounds could be enhanced if they were allowed to take and recall notes.

Taking notes while listening is a rather challenging task for test takers. Previous researchers have studied different criteria for evaluating the quality of notes, differences in the notes taken by L1 speakers and L2 learners, and the relationship between note quality and test performance. However, whether there are specific differences in the notes taken by L2 learners from different L1 backgrounds remains to be investigated.

Liu (2001) studied the specific features of the notes taken by Chinese learners of English and the findings were instructive: (a) the availability of notes during the stage of question answering could facilitate the recognition and recall of detailed information; (b) there was a positive correlation between the number of content words and lecture-specific information. Therefore, Liu suggested that L2 learners should write down more content words in their notes when processing mini-lectures. However, Liu's (2001) study only analyzed the notes taken by Chinese learners of English. The

study did not compare differences in notes taken by L2 learners from heterologous L1 backgrounds. Within the increasingly globalized world, Asian EFL learners have been striving to improve their L2 English learning. The features of notes taken by L2 learners from different Asian cultural backgrounds should be compared, to shed light on how to take effective and quality notes so as to hone Asian EFL learners' listening comprehension competency.

Koren (1997) discovered that L2 learners are inclined to take notes in their L1. In Koren's study, the way in which 65 Israeli learners of English, who were all law majors, took notes was observed. Koren found that: (a) the role of mother tongue in recalling contents in a foreign language is important; (b) the majority of the L2 learners of English in the study were inclined to translate what they had heard into their mother tongue to facilitate their comprehension and recall; and (c) although the participants were not professional, their translations were acceptable and useful for recalling audio materials in English.

However, these studies only revealed how L2 learners from different L1 backgrounds take notes separately; thus, a comparison of notes taken by L2 learners from different L1 backgrounds should be conducted.

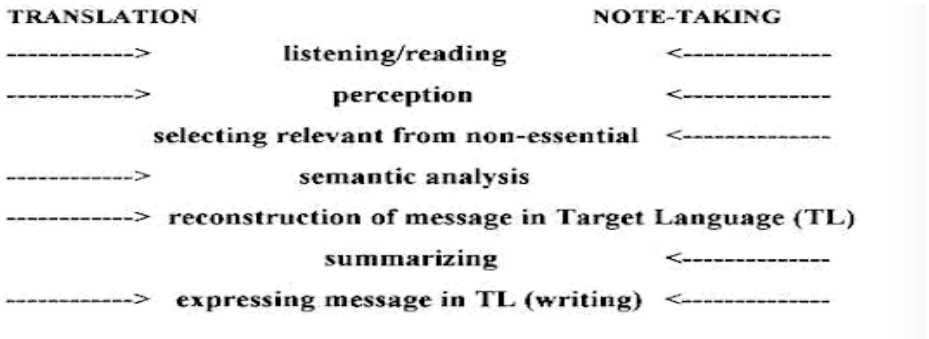
From the above-mentioned criteria for evaluating the quality of notes taken by L2 learners, the answerability and total numbers of words, abbreviations, information units, and reformulations have been the main focus of previous research; however, this study aims to ascertain the role of L1 use in note-taking while listening to audio materials in the target language.

A number of researchers have verified the role of mother tongue in the process of acquiring a foreign language (Urgese, 1989; Parks, 1982; Koren, 1997). They similarly concluded: (a) translating the target language into mother tongue during the pro-

cess of acquiring foreign languages should not be viewed negatively by FL teachers; (b) L2 learners tend to translate what they have heard in the target language into their mother tongue; and (c) L2 learners can take advantage of their mother tongue to facilitate their L2 listening comprehension. Therefore, it is necessary for researchers to further investigate the effects of using mother tongue to take notes while listening to academic lectures in the target language. Parks (1982) and Fajardo (1996) similarly reported on how L2 learners translate what they have heard in the target language while taking notes.

Figure 2.2

The Process of Translation while Taking Notes (based on Parks, 1982 and Fajardo, 1996)



The process shown in Figure 2.2 reveals how L2 learners perceive and comprehend listening and reading materials in the target language. In this step, whether they can use their mother tongue to translate and comprehend audio materials in the target language is critical. Without this, the following steps would be meaningless. Following this, they need to distinguish important information from unimportant information, reconstruct what they have comprehended in the target language, and take notes in both the target language and mother tongue. As mentioned above, some re-

searchers have verified the role of mother tongue in recall and note-taking. In addition, Koren (1997) has studied how Israeli learners of English take notes in their mother tongue; however, more studies should be conducted to uncover the differences in notes taken by L2 learners from different L1 backgrounds, particularly the differences in using their mother tongue to take notes. Thus, the use of mother tongue to take notes will be a specific point of Research Question 4 in this study.

Based on the above-mentioned gaps, the study asks the following four research questions.

1) What are the differences in advanced and intermediate learners' self-reports of using listening strategies to recall information?

2) What are the differences in Japanese and Chinese listeners' self-reports of using listening strategies to recall information?

3) What are the differences in notes taken by participants at different language proficiency levels?

4) What are the differences in notes taken by Japanese and Chinese learners of English?

Chapter 3: Method

This chapter introduces how the study was conducted by describing the participants, materials, instruments, procedures, and coding method.

3.1 Participants

The participants in this study comprised 30 native speakers of Chinese and 27 native speakers of Japanese (see Table 3.1). Thirty Chinese students from different Chinese universities, i.e., Wuhan University of Technology and Hubei University of Technology, and 27 students from several high-ranking universities in Japan, i.e., Keio University, Tokyo University of Foreign Study, and Tokyo University of Technology, participated in the study. The participants were classified into two groups, the advanced English proficiency and intermediate English proficiency groups.

Their standardized English test scores were taken into consideration when classifying them into groups. According to the standards set by the Educational Testing Service (2005), participants whose TOEFL scores exceeded 88 were classified into the advanced English proficiency group, while those whose TOEFL scores were between 56–87 were categorized into the intermediate English proficiency group. Based on the Score Conversion Table by Unison English School, the participants whose TOEIC scores exceeded 800, equivalent to TOEFL scores of over 88, were regarded as advanced listeners. The remaining participants, whose scores were between 540–799, equivalent to TOEFL scores of 56–87, were classified into the intermediate English proficiency group. Based on this standard, 33 participants were classified in the advanced English proficiency group, and 24 participants were classified in the inter-

mediate English proficiency group in this study.

The Chinese participants comprised 22 female and 8 male college students, with an average age of 19.4, while the Japanese participants comprised 12 female and 15 male college students, with an average age of 20.7. The participants came from different academic fields, which the researcher classified into two groups: arts major students and science major students. Among the Chinese participants in the study, there were 25 arts major students and 5 science major students; among the Japanese students, there were 12 arts major students and 15 science major students. The researcher collected the data from the Japanese participants at three different time points. The data from Tokyo University of Foreign Study, Tokyo University of Technology, and Keio University were collected on May 9th, May 16th, and May 20th, 2015 respectively. The Chinese participants from Wuhan University of Technology and Hubei University of Technology participated in the study on June 12th and June 20th, respectively.

Table 3.1

Participant Characteristics

Study groups	Gender		Age	Major	
	Male	Female		Arts	Science
Chinese (*n*=30)	8	22	19.4	25	5
Japanese (*n*=27)	15	12	20.7	12	15

3.2 Materials

All participants were asked to listen to two audio lectures named “Octopus” and “Roman sculptures” from the authentic TOEFL listening comprehension test. There were 12 multiple-choice questions in total (each lecture had six questions). The participants were not allowed to view the corresponding questions until they had finished listening to each lecture. The two lectures lasted for 327 and 296 seconds, and the themes of the two lectures were related to biology and history, respectively. The 12 comprehension questions aimed to test whether test takers understood the gist and details of the two lectures, as well as whether they could make inferences. Two of the twelve questions are shown (see Appendix A).

3.3 Instruments

A questionnaire was designed (see Appendix B) on the basis of Vandergrift’s classification of listening comprehension strategies (1997). It contained 13 items, which were designed to measure how participants recalled the contents processed using different listening comprehension strategies in order to complete the corresponding listening comprehension tasks. The participants were asked to respond to each item on a six-point Likert scale. In the questionnaire, items that focused on linking words and the relationship between sentences were added to supplement Vandergrift’s version of the classification of listening comprehension strategies. The researcher chose Vandergrift’s questionnaire for this study because her classification was the most practical. Flowerdew and Miller (2005) suggested that L2 learners might be more familiar with Vandergrift’s classification of listening comprehension strategies as they are often

mentioned and taught in listening comprehension classes. They also claimed that Vandergrift's categorization might be effective for the think-aloud procedure, which enables researchers to effectively judge and record the listening comprehension strategies used by L2 learners. However, the researcher omitted some listening comprehension strategies from Vandergrift's original version to make the study more authentic. For instance, due to the fact that test takers are prohibited from exchanging ideas with each other during the TOEFL listening comprehension test, they could not use socio-affective strategies, in which listeners ask each other for help when facing difficulties. Furthermore, as mentioned above, the purpose of this study is to investigate how listeners use listening comprehension strategies to stimulate recall; however, some listening comprehension strategies cannot be used for recall, such as advanced organization, which involves listeners predicting the topic of a lecture before listening to it. This study focused on how listeners recall the contents decoded using different listening comprehension strategies. However, advanced organization is not related to decoding audio information directly. Similarly, some other listening strategies presented by Vandergrift, including resourcing, repeating, and lowering anxiety were also omitted. Finally, 13 important listening comprehension strategies that can be used to decode listening materials by listeners were retained and used for the questionnaire in this study.

The second part of the questionnaire asked participants to provide their personal information, such as age, major, standardized English proficiency test scores, educational background, and future English learning goals.

3.4 Procedures

First, the procedure of this study was introduced to the participants. They had one practice session in order to confirm that they understood their task. The questionnaire contained many linguistic terms, such as linking words. In order to prevent participants from misunderstanding these terms, the researcher explained their meanings comprehensively to the participants. After the practice session, they listened to the real lectures. Meanwhile, they were allowed to take notes and were informed that the researcher would later compare the quality of their notes with that of other participants. They were next asked to complete the questionnaire described above. The participants' frequency of responses to the questionnaire was also displayed, while their notes were evaluated according to the following four criteria: Total-number-of-notations, Total-number-of-content words, Use of mother tongue, and Test-answerability.

Post-hoc interviews were conducted after the data collection, during which participants were asked about their past experience of learning English, how they recalled the contents processed using different listening comprehension strategies, and how they took notes.

3.5 Analysis

Means comparisons were carried out using a two-way analysis of variance (ANOVA) to analyze the differences in average scores on the listening comprehension test used in this study between different groups. Descriptive and frequency statistics were used to describe the results of the tests, and questionnaires were used to answer Research

Questions 1 and 2. A two-way ANOVA was also used to answer Research Questions 3 and 4.

The coding methods mentioned earlier to evaluate note-taking quality were similar to those used in Carrell's (2007) study, which was concerned with how L2 learners of English from different L1 cultural backgrounds take notes in the TOEFL listening comprehension test. Since the criteria used to evaluate the quality of notes in her study were more related to TOEFL, the present study also used her evaluation criteria. Firstly, with regard to the total number of notations, the Japanese research assistants counted the total number of abbreviations, symbols, and arrows used in the notes taken by the Japanese participants in this study, and the Chinese research assistants did the same for Chinese learners' notes. Secondly, the Japanese assistants counted the total number of content words in the Japanese participants' notes, and the Chinese assistants did the same thing for the Chinese learners' notes. The researcher intended to use the number of information units as an evaluation criterion; however, there were almost no complete information units in the participants' notes, as the speech rate of the materials used in the present study was rather fast, which meant participants were unable to write down complete information units. Thirdly, the Japanese assistants counted the total number of Japanese words in the Japanese students' notes. As some Japanese characters are meaningless, the Japanese assistants did not simply count the number of Japanese characters in the participants' notes, but rather counted the number of meaningful Japanese words therein. The Chinese research assistants did the same for the Chinese participants' notes. Lastly, there were 15 crucial points that could be referred to, to answer the 12 comprehension questions. In order to answer the fourth question of the first lecture correctly, a note taker needed to write "projections" and "texture," or their synonyms. If so, he or she could earn one point. If a note taker

wrote six points, his answerability was calculated at 6/15, giving an answerability of 0.4. The Japanese assistants judged how many of the 15 points were present in the Japanese participants' notes, and the Chinese assistants judged the Chinese participants' notes using the same method.

Chapter 4: Results

4.1 Test Scores between Different Study Groups

The descriptive statistics for the Japanese test takers showed an average score of 7.63 (*SD* = 2.33), with minimum and maximum scores of 3 and 12, respectively (see Table 4.1). This indicates that the test difficulty was acceptable, and that participants' scores varied widely. Item score reliability was checked using Kuder-Richardson 21 (K-R21), with a value of 0.52. This would indicate that the test items consistently functioned 52% of the time, or alternatively that they inconsistently functioned 48% of the time. Given the low number of total items on the test ($k = 12$), this result was not particularly surprising, but might impact interpretations based on test results at a later stage.

The descriptive statistics for the Chinese test takers showed an average score of 8.4 (*SD* = 2.47), with minimum and maximum scores of 4 and 12, respectively (see Table 4.1). Item score reliability was 0.64, indicating that the test items consistently functioned 64% of the time, or alternatively that they inconsistently functioned 36% of the time.

The descriptive statistics for the advanced test takers showed an average score of 10.04 (*SD* = 1.23), with minimum and maximum scores of 7 and 12, respectively (see Table 4.2). This indicates that the test was not easy, and that participants' scores varied widely. Item score reliability was checked using Kuder-Richardson 21 (K-R21), with a value of 0.13. This would indicate that the test items consistently functioned 13% of the time, or alternatively that they inconsistently functioned 87% of the time. Given the low total number of test items ($k = 12$), the descriptive statistics for

the intermediate test takers showed an average score of 6.58 (*SD* = 1.98), with minimum and maximum scores of 3 and 10, respectively (see Table 4.2). Item score reliability was 0.26, indicating that the test items consistently functioned 26% of the time, or alternatively that they inconsistently functioned 74% of the time.

Table 4.1

Scores on the Listening Comprehension Test for Japanese and Chinese Participants

Study groups	*n.*	*M*	*SD*	*Min*	*Max*	*KR21*
The Chinese participants	30	8.40	2.47	4.0	12.0	0.64
The Japanese participants	27	7.63	2.33	3.0	12.0	0.52

Table 4.2

Scores on the Listening Comprehension Test for Advanced and Intermediate Participants

Study groups	*n.*	*M*	*SD*	*Min*	*Max*	*KR21*
The Advanced participants	24	10.04	1.23	7	12.0	0.13
The Intermediate participants	33	6.58	1.98	3	10.0	0.26

The results of the ANOVA are given in Table 4.3. Beginning with the second column, the sum of squares (*SS*) is given, followed by the degrees of freedom (*df*),

mean squares (*MS*), *F* values, alpha values, and effect sizes (η^2). Mean differences were found for the data at F (1,57) = 1.452, p = .233. The degree of effect of directionality was found to be .03, or approximately 3% of the variance in scores was accounted for by differences in L1 background. This finding indicated that the difference in test scores between the Japanese and Chinese groups could not be explained by their different L1 backgrounds.

Table 4.3

Differences in Scores on the Listening Comprehension Test for Japanese and Chinese Participants

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig*	η^2
L1 background	8.434	1	8.434	1.452	0.233	0.03
Error	319.496	55	5.809			
Total	4008.000	57				

Regarding the differences between the advanced and intermediate listeners, mean differences were found for the data at F (1, 57) = 57.013, p = .000. The degree of effect of directionality was found at .51, or approximately 51% of the variance in scores was accounted for by differences in language proficiency levels (see Table 4.4). This indicates that participants' different language proficiency levels contributed to their different test scores.

Table 4.4

Differences in Scores on the Listening Comprehension Test for Advanced and Intermediate Participants

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig*	η^2
Proficiency level	166.911	1	166.911	57.013	0.000	0.51
Error	161.019	55	2.928			
Total	4008.000	57				

4.2 Differences in How Advanced and Intermediate Learners Used Listening Strategies to Facilitate Recall.

It might be difficult for participants to understand the meaning of each item in the questionnaire fully, despite the researcher explaining every item and conducting a practice session on listening comprehension and the selection of listening strategies. There is a risk of the learners only selecting the items that are easy to comprehend. Thus, to make the findings of the present study more reliable, the researcher will only report the most frequently used listening strategies participants adopted to facilitate recall. Based on Table 4.5 and Table 4.7, it could be perceived that the advanced and intermediate participants in this study used different listening strategies to facilitate recall. The advanced listeners preferred to recall the gist of a lecture (M=3.79, SD=1.41*)*, with minimum and maximum scores of 2 and 5, respectively. Furthermore, the higher proficiency level listeners seemed to draw on the content after linking

words to facilitate recall (*M*=3.58, *SD*=0.93*)*, with minimum and maximum scores of 2 and 5, respectively. They also preferred to recall content from their notes (*M*=3.54, *SD*=1.25*)*, with minimum and maximum scores of 1 and 5. Lastly, the advanced listeners preferred to recall complete information units (*M*=3.33, *SD*=1.34*)*, with minimum and maximum scores of 0 and 5.

The lower level listeners in this study were inclined to select the following listening strategies to facilitate recall. They preferred to recall single words (*M*=3.24, *SD*=1.15*)*, with minimum and maximum scores of 0 and 5. They also liked to recall repeated words in order to complete the corresponding listening comprehension tasks (*M*=2.82, *SD*=1.47*)*, with minimum and maximum scores of 0 and 5, respectively. Frequency analyses for the two groups are shown in Table 4.6 and Table 4.8, respectively.

Table 4.5

Descriptive Analysis of Listening Strategies Used to Facilitate Recall by Advanced Participants

Listening strategies used to facilitate recall	*M*	*SD*	*Min*	*Max*
1. I recalled the gist of the lecture to choose my response	3.79	1.14	2	5
5. I recalled the content after linking words in the lectures to choose my response.	3.58	0.93	2	5
10. I recalled the notes I had taken to choose my response.	3.54	1.25	1	5

2. I recalled the complete meaning groups in the lectures to choose my response.	3.33	1.34	0	5
3. I recalled some single words in the lectures to choose my response.	3.29	1.46	0	5
12. I recalled the content processed by analyzing the relationship between sentences in the lecture to choose my response	3.08	1.32	0	5
4. I recalled the repeated words in the lecture to choose my response	2.88	1.62	0	5
6. I recalled the content processed by focusing on the tone of the lecturer to choose my response	2.75	1.60	0	5
9. I recalled the structure of the lectures in my mind to choose my response.	2.67	1.40	0	5
11. I recalled the contents processed by making inferences to choose my response	2.46	.98	1	4
8 I recalled the picture depicting the content of the lectures to choose my response	2.38	1.53	0	5
7 I recalled the content processed by referring to my prior background knowledge to choose my response	1.96	1.20	0	5

13 I recalled the meaning groups processed by translating into my mother language to choose my response	1.63	1.34	0	5

Table 4.6

Frequency Distribution for Listening Strategies Used to Facilitate Recall by Advanced Participants

Recall	*Groups*	*Never*	*Hardly*	*Sometimes*	*Often*	*Usually*	*Always*
1	advanced	0%	0%	16.7%	25.0%	20.8%	37.5%
5	advanced	0%	0%	12.5%	33.3%	37.5%	16.7%
10	advanced	0%	4.2%	20.8%	20.8%	25.0%	29.2%
2	advanced	4.2%	0%	29.2%	12.5%	33.3%	20.8%
3	advanced	4.2%	8.3%	16.7%	20.8%	25.0%	25.0%
12	advanced	8.3%	0%	16.7%	37.5%	25.0%	12.5%
4	advanced	8.3%	16.7%	12.5%	25.0%	16.7%	20.8%
6	advanced	4.2%	25.0%	20.8%	8.3%	25.0%	16.7%
9	advanced	8.3%	8.3%	29.2%	29.2%	12.5%	12.5%
11	advanced	0%	16.7%	37.5%	29.2%	16.6%	0%
8	advanced	12.5%	12.5%	37.5%	12.5%	12.5%	12.5%

7	advanced	4.2%	33.3%	41.7%	12.5%	0%	8.3%
13	advanced	20.8%	33.3%	20.8%	16.7%	4.2%	4.2%

Table 4.7

Descriptive Analysis of Listening Strategies Used to Facilitate Recall by Intermediate Participants

Listening strategies used to facilitate recall	*M*	*SD*	*Min*	*Max*
3. I recalled some single words in the lectures to choose my response.	3.24	1.15	0	5
1. I recalled the gist of the lecture to choose my response	2.88	1.67	1	5
4. I recalled the repeated words in the lecture to choose my response	2.82	1.47	0	5
5. I recalled the content after the linkage words in the lectures to choose my response.	2.73	1.42	0	5
10. I recalled the notes I had taken to choose my response.	2.55	1.50	0	5
11. I recalled the content processed by making inferences to choose my response	2.36	1.25	0	5

7. I recalled the content processed by referring to my prior background knowledge to choose my response	2.27	1.55	0	5
13 I recalled the meaning groups processed by translating into my mother language to choose my response	2.24	1.30	0	5
2. I recalled the complete meaning groups in the lectures to choose my response.	2.12	1.02	0	4
9. I recalled the structure of the lectures in my mind to choose my response.	2.03	1.36	0	5
12. I recalled the content processed by analyzing the relationship between sentences in the lecture to choose my response	2.03	1.24	0	4
6. I recalled the content processed by focusing on the tone of the lecturer to choose my response	1.85	1.50	0	5
8 I recalled the picture depicting the contents of the lecture to choose my response	1.85	1.30	0	4

Table 4.8

Frequency Distribution for Listening Strategies Used to Facilitate Recall by Intermediate Participants

Recall	*Groups*	*Never*	*Hardly*	*Sometimes*	*Often*	*Usually*	*Always*
3	intermediate	3.0%	0%	24.2%	27.3%	33.1%	12.1%
1	intermediate	0%	15.2%	21.2%	30.3%	27.3%	6.0%
4	intermediate	6.1%	15.2%	15.2%	36.4%	9.1%	18.0%
5	intermediate	6.1%	12.1%	30.3%	18.2%	21.2%	12.1%
10	intermediate	12.1%	15.2%	15.2%	30.3%	18.2%	9.0%
11	intermediate	6.1%	18.2%	30.3%	30.3%	9.0%	6.1%
7	intermediate	15.2%	21.2%	15.2%	27.3%	12.1%	9.0%
13	intermediate	6.1%	24.2%	33.3%	18.2%	12.1%	6.1%
2	intermediate	6.1%	21.2%	33.3%	33.3%	6.1%	0%
9	intermediate	12.1%	30.3%	18.2%	24.2%	12.1%	3.0%

12	intermediate	12.1%	21.2%	33.3%	18.2%	15.2%	0%
6	intermediate	24.2%	18.2%	27.3%	15.2%	9.1%	6.1%
8	intermediate	18.2%	24.2%	24.2%	21.2%	12.2%	0%

4.3 Differences in How Japanese and Chinese Learners Used Listening Strategies to Facilitate Recall

This study also revealed differing patterns in how Chinese and Japanese participants used listening strategies to facilitate recall. The Chinese participants preferred to use the gist of a lecture to facilitate recall (*M*=3.70 *SD*=1.15*)*, with minimum and maximum scores of 1 and 5, respectively (see Table 4.9). They also made full use of their notes to facilitate recall (*M*=3.33, *SD*=1.21*)*, with minimum and maximum scores of 1 and 5, respectively. Lastly, they were also inclined to recall the content after linking words (*M*=3.33, *SD*=1.27*)*, with minimum and maximum scores of 0 and 5, respectively.

In contrast, the Japanese participants were inclined to use single words to facilitate recall (*M*=3.22, *SD*=1.01*)*, with minimum and maximum scores of 2 and 5, respectively. They also tended to use the content after linking words to facilitate recall (*M*=2.81, *SD*=1.30*)*, with minimum and maximum scores of 1 and 5, respectively. Lastly, they paid attention to repeated words from the lectures to facilitate recall (*M*=2.78, *SD*=1.31*)*, with minimum and maximum scores of 0 and 5, respectively.

Frequency analyses for the above two groups are shown in Table 4.10 and Table 4.11.

Table 4.9

Descriptive Analysis of Listening Strategies Used to Facilitate Recall by Chinese Participants

Listening strategies used to facilitate recall	*M*	*SD*	*Min*	*Max*
1. I recalled the gist of the lecture to choose my response	3.70	1.15	1	5
5. I recalled the content after the linkage words in the lectures to choose my response.	3.33	1.27	0	5
10. I recalled the notes I had taken to choose my response.	3.33	1.21	1	5
3. I recalled some single words in the lectures to choose my response.	3.30	1.49	0	5
4. I recalled the repeated words in the lecture to choose my response	2.90	1.70	0	5
2. I recalled the complete meaning groups in the lectures to choose my response.	2.73	1.51	0	5

11. I recalled the content processed by making inferences to choose my response	2.70	.95	0	4
9. I recalled the structure of the lectures in my mind to choose my response.	2.43	1.41	0	5
13 I recalled the meaning groups processed by translating into my mother language to choose my response	2.37	1.45	0	5
7 I recalled the content processed by referring to my prior background knowledge to choose my response	2.23	1.38	0	5
12. I recalled the content processed by analyzing the relationship between sentences in the lecture to choose my response	2.23	1.41	0	5
6. I recalled the content processed by focusing on the tone of the lecturer to choose my response	2.1	1.61	0	5
8 I recalled the picture depicting the contents of the lecture to choose my response	2.0	1.37	0	5

Table 4.10

Frequency Distribution for Listening Strategies Used to Facilitate Recall by Chinese Participants

Recall	*Groups*	*N*	*Never*	*Hardly*	*Sometimes*	*Often*	*Usually*	*Always*
1	Chinese	30	0%	3.3%	13.3%	23.3%	30.0%	30.0%
5	Chinese	30	6.7%	0%	13.3%	26.7%	40.0%	13.3%
10	Chinese	30	0%	6.7%	16.7%	36.7%	16.7%	23.3%
3	Chinese	30	6.7%	6.7%	13.3%	20.0%	30.0%	23.3%
4	Chinese	30	6.7%	20.0%	16.7%	20.0%	6.7%	30.0%
2	Chinese	30	10.0%	10.0%	20.0%	33.3%	10.0%	16.7%
11	Chinese	30	3.3%	3.3%	33.3%	40.0%	20.0%	0%
9	Chinese	30	13.3%	6.7%	30.0%	33.3%	6.7%	10.0%
13	Chinese	30	10.0%	20.0%	23.3%	26.7%	10.0%	10.0%
7	Chinese	30	10.0%	20.0%	30.0%	26.7%	3.3%	10.0%

12	Chinese	30	16.7%	13.3%	20.0%	33.3%	13.3%	3.3%
6	Chinese	30	16.7%	23.3%	26.7%	13.3%	6.7%	13.3%
8	Chinese	30	16.7%	20.0%	26.7%	23.3%	10.0%	3.3%

Table 4.11

Descriptive Analysis of Listening Strategies Used to Facilitate Recall by Japanese Participants

Listening strategies used to facilitate recall	*M*	*SD*	*Min*	*Max*
3. I recalled some single words in the lectures to choose my response.	3.22	1.01	2	5
5. I recalled the content after the linkage words in the lectures to choose my response.	2.81	1.30	1	5
4. I recalled the repeated words in the lecture to choose my response	2.78	1.31	0	5
1. I recalled the gist of the lecture to choose my response	2.78	1.16	1	5
12. I recalled the content processed by analyzing the relationship between sentences in the lecture to choose my response	2.74	1.29	0	5

10. I recalled the notes I had taken to choose my response.	2.56	1.65	0	5
2. I recalled the complete meaning groups in the lectures to choose my response.	2.52	1.05	1	4
6. I recalled the content processed by focusing on the tone of the lecturer to choose my response	2.37	1.60	0	5
8 I recalled the picture depicting the contents of the lecture to choose my response	2.15	1.49	0	5
9. I recalled the structure of the lectures in my mind to choose my response.	2.15	1.41	0	5
11. I recalled the content processed by making inferences to choose my response	2.07	1.24	0	5
7 I recalled the content processed by referring to my prior background knowledge to choose my response	2.04	1.45	0	5
13 I recalled the meaning groups processed by translating into my mother language to choose my response	1.56	1.09	0	4

Table 4.12

Frequency Distribution for Listening Strategies Used to Facilitate Recall by Japanese Participants

Recall	*Groups*	*N*	*Never*	*Hardly*	*Sometimes*	*Often*	*Usually*	*Always*
3	Japanese	27	0%	0%	29.6%	29.6%	29.6%	11.1%
5	Japanese	27	0%	14.8%	33.3%	22.2%	14.8%	14.8%
4	Japanese	27	7.4%	11.1%	11.1%	44.4%	18.5%	7.4%
1	Japanese	27	0%	14.8%	25.9%	33.3%	18.5%	7.4%
12	Japanese	27	3.7%	11.1%	33.3%	18.5%	25.9%	7.4%
10	Japanese	27	14.8%	14.8%	18.5%	14.8%	25.9%	11.1%
2	Japanese	27	0%	14.8%	44.4%	14.8%	25.9%	0%
6	Japanese	27	14.8%	18.5%	22.2%	11.1%	25.9%	7.4%
8	Japanese	27	14.8%	18.5%	33.3%	11.1%	14.8%	7.4%
9	Japanese	27	7.4%	37.0%	14.8%	18.5%	18.5%	3.7%
11	Japanese	27	3.7%	33.3%	33.3%	18.5%	3.7%	7.4%
7	Japanese	27	11.1%	33.3%	22.2%	14.8%	11.1%	7.4%
13	Japanese	27	14.8%	37.0%	33.3%	7.4%	7.4%	0%

4.4 Differences in Notes Taken by Advanced and Intermediate Learners

The reliability of raters was tested (see Table 4.13) and their inter-rater reliability in total-number-of-notations was 0.97 (*M1*=74.19, *SD1*=42.62; *M2*=71.35, *SD2*=46.64*)*. The reliability between the two raters in total-number-of-content-words was 0.87 (*M1*=23.57, *SD1*=18.49; *M2*=19.51, *SD2*=18.61*)*. The reliability between the two raters in the number of content words in L1 was 0.95 (*M1*=7.01, *SD1*=10.04; *M2*=6.17, *SD2*=9.87*)*. The correlation between the raters in L1 characters was 0.98 (*M1*=1.93, *SD1*=2.61; *M2*=1.89, *SD2*=2.58). The reliability between the two raters in answerability score was 1.0 (*M1*=0.47, *SD1*=0.25; *M2*=0.47, *SD2*=0.25*)*. Based on the above findings, inter-rater reliability was found to be reliable.

Table 4.13

Inter-rater Reliability

Criteria	*Raters*	*M*	*SD*	*Pearson Correlation*	*Sig. (2-tailed)*
C1.Total-number-of-notations	1	74.19	42.62	1	0.97**
	2	71.35	46.64	1	0.97**
C2.Total number of content words	1	23.57	18.49	1	0.87**
	2	19.51	18.61	1	0.87**
C3.The number of content words in L1	1	7.01	10.04	1	0.95**
	2	6.17	9.87	1	0.95**

C4.The number of charac-	1	1.93	2.61	1	0.98**
ters in L1	2	1.89	2.58	1	0.98**
C5.Test-answerability	1	0.47	0.25	1	1.00**
	2	0.47	0.25	1	1.00**

The descriptive statistics for the number of notations showed an average of 74.19 (*SD* = 42.62), with minimum and maximum numbers of 4 and 179, respectively (see Table 4.14). The average of total-number-of-content words was 23.58 (*SD* = 18.49), with minimum and maximum numbers of 0 and 101, respectively. The descriptive statistics for the number of content words in L1 showed an average of 6.60 (*SD* = 9.84), with minimum and maximum numbers of 0 and 40, respectively. The average score of answerability was 0.47 (*SD* = 0.24), with minimum and maximum percentages of 0.07 and 0.87, respectively.

Based on Table 4.15, the correlation between test scores and the number of notations was 0.47 (p=0.00). The number of content words was correlated with test scores: 0.41 (p= 0.00). In addition, the correlation between the number of content words in L1 and test scores was 0.40 (p=0.00). Lastly, test scores were correlated with answerability: 0.71 (p=0.00). It could be perceived that test scores were highly correlated with the criteria evaluating the quality of notes taken by the participants in the present study. However, the correlation between the number of characters in L1 and test scores was 0.31 (p=0.02), so the correlation between the two variables was weak.

Table 4.14

Descriptive Analysis for the Criteria to Evaluate Note Quality

Criteria for evaluating note quality	*M*	*SD*	*Min*	*Max*
C1.Total-number-of-notations	74.19	42.62	4	179
C2.Total number of content words	23.58	18.49	0	101
C3.The number of content words in L1	6.60	9.84	0	40
C4.The number of characters in L1	1.86	2.42	0	8
C5.Test-answerability	.47	.24	.07	.87

Table 4.15

Correlation between Scores and Criteria to Evaluate Note Quality

		Scores	C1	C2	C3	C4	C5
Scores	Pearson Correlation	1	.47**	.41**	.40**	.31	.71**
	R^2		.22	.17	.16	.09	.50
	Sig. (2-tailed)		.00	.00	.00	.02	.00
	N.	57	57	57	57	57	57

**. Correlation is significant at the 0.01 level (2-tailed).

Based on Table 4.16, the descriptive statistics for the number of notations in the notes taken by advanced test takers showed an average of 96.50 (*SD* = 43.78), with minimum and maximum scores of 39 and 172, respectively (see Table 4.16). The average number of content words in the notes taken by advanced test takers was 31.25

(*SD* = 19.47), with minimum and maximum scores of 9 and 100, respectively. The descriptive statistics for the number of content words in L1 in the notes taken by advanced test takers showed an average of 9.29 (*SD* = 12.28), with minimum and maximum scores of 0 and 40, respectively. In addition, the descriptive statistics for the number of L1 characters in the notes taken by advanced test takers showed an average of 2.12 (*SD* = 2.34), with minimum and maximum scores of 0 and 8, respectively. The average of score answerability of advanced test takers was 0.66 (*SD* = 0.16), with minimum and maximum scores of 0.20 and 0.87, respectively.

The average number of notations in the notes taken by intermediate listeners was 55.52 (*SD* = 36.40), with minimum and maximum scores of 5 and 180, respectively (see Table 4.16). The descriptive statistics for the number of content words in the notes taken by intermediate test takers showed an average of 14.48 (*SD* = 13.05), with minimum and maximum scores of 0 and 45, respectively. The descriptive statistics for the number of content words in L1 in the notes taken by lower level participants showed an average of 4.64 (*SD* = 7.07), with minimum and maximum scores of 0 and 32, respectively. The descriptive statistics for the number of characters in L1 in the notes taken by lower level participants showed an average of 1.67 (*SD* = 2.49), with minimum and maximum scores of 0 and 7, respectively. The average score of answerability was 0.33 (*SD* = 0.20), with minimum and maximum scores of 0.07 and 0.73, respectively.

Table 4.16

Descriptive Analysis of Notes Taken by Advanced and Intermediate Participants

Criteria for evaluating notes	*Proficiency*	*n.*	*M*	*SD*	*Min*	*Max*
C1.Total-number-of-notations	Advanced	24	96.50	43.78	39	172
	Intermediate	33	55.52	36.40	5	180
C2.Total number of content	Advanced	24	31.25	19.47	9	100
words	Intermediate	33	14.48	13.05	0	45
C3.The number of content	Advanced	24	9.29	12.28	0	40
words in L1	Intermediate	33	4.64	7.07	0	32
C4. The number of characters	Advanced	24	2.12	2.34	0	8
in L1	Intermediate	33	1.67	2.49	0	7
C5.Test-answerability	Advanced	24	.66	.16	.20	.87
	Intermediate	33	.33	.20	.07	.73

Several differences were found between the way in which advanced and intermediate participants took notes. Advanced listeners wrote more notations than intermediate listeners F (1, 57) = 14.843, p = .000. The degree of effect of language proficiency level was 0.21, or approximately 21% of the variance in the number of notations was accounted for by different proficiency levels (see Table 4.17). Advanced listeners wrote more content words than intermediate listeners F (1, 57) = 15.160, p = .000. The degree of effect of language proficiency level was found at 0.22, or approximately 22% of the variance in the number of content words was accounted for by different language proficiency levels (see Table 4.18). The findings revealed that

the test-answerability score of the advanced listeners in my sample was higher than that of their intermediate counterparts F (1, 57) = 43.812, p =.000 (see Table 4.21). The degree of effect of language proficiency level was found at .44, or approximately 44% of the variance in answerability was accounted for by difference in language proficiency level (see Table 4.21). However, there was no statistical difference in the number of content words in L1 between advanced and intermediate participants F (1, 57) = 3.233, p =.078 (see Table 4.19). Lastly, no difference was found between the two study groups in the number of characters in L1, F (1, 57) = 0.493, p =.486 (see Table 4.20).

Table 4.17

Differences in Total Number of Notations between Advanced and Intermediate Participants

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig*	η^2
Proficiency level	23333.793	1	23333.793	14.843	0.00	0.21
Error	86482.242	55	1572.404			
Total	411680.000	57				

* Bonferroni adjusted alpha set at $p < .01$ to account for multiple comparisons

Table 4.18

Differences in Total Number of Content Words between Advanced and Intermediate Participants

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig*	η^2
Proficiency level	3905.398	1	3905.398	15.160	0.00	0.22
Error	14168.742	55	257.613			
Total	44530.000	57				

* Bonferroni adjusted alpha set at $p < .01$ to account for multiple comparisons

Table 4.19

Differences in Total Number of Content Words in L1 between Advanced and Intermediate Participants

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig*	η^2
Proficiency level	301.125	1	301.125	3.233	0.078	0.05
Error	5122.595	55	93.138			
Total	7904.000	57				

* Bonferroni adjusted alpha set at $p < .01$ to account for multiple comparisons

Table 4.20

Differences in Total Number of Characters in L1 between Advanced and Intermediate Participants

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig*	η^2
Proficiency level	2.919	1	2.919	.493	0.486	0.01
Error	325.958	55	5.927			
Total	526.000	57				

*Bonferroni adjusted alpha set at $p < .01$ to account for multiple comparisons

Table 4.21

Differences in Test-answerability between Advanced and Intermediate Participants

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig*	η^2
Proficiency level	1.527	1	1.527	43.812	0.00	0.44
Error	1.917	55	0.035			
Total	16.111	57				

* Bonferroni adjusted alpha set at $p < .01$ to account for multiple comparisons

4.5 Differences in Notes Taken by Chinese and Japanese Learners

The descriptive statistics for the number of notations in the notes taken by Chinese test takers showed an average of 63.63 (*SD* = 36.58), with minimum and maximum

scores of 15 and 180, respectively (see Table 4.22). The average number of content words in the notes taken by Chinese test takers was 17.90 (*SD* = 14.32), with minimum and maximum scores of 0 and 61, respectively. The descriptive statistics for the number of content words in L1 in the notes taken by Chinese test takers showed an average of 9.53 (*SD* = 12.52), with minimum and maximum scores of 0 and 40, respectively. The descriptive statistics for the number of characters in L1 in the notes taken by Chinese test takers showed an average of 2.40 (*SD* = 2.94), with minimum and maximum scores of 0 and 8, respectively. The average score of answerability of Chinese test takers was 0.53 (*SD* = 0.24), with minimum and maximum scores of 0.11 and 0.87, respectively.

The descriptive statistics for the number of notations in the notes taken by Japanese test takers showed an average of 82.93 (*SD* = 50.28), with minimum and maximum scores of 5 and 172, respectively (see Table 4.22). The descriptive statistics for the number of content words in the notes taken by Japanese test takers showed an average of 25.59 (*SD* = 20.83), with minimum and maximum scores of 0 and 100, respectively. The average number of content words in L1 in the notes taken by Japanese test takers was 3.33 (*SD* = 3.56), with minimum and maximum scores of 0 and 12, respectively. The mean number of characters in L1 in the notes taken by Japanese test takers was 1.26 (*SD* = 1.51), with minimum and maximum scores of 0 and 4, respectively. The descriptive statistics for the score of answerability of the Japanese test takers was 0.40 (*SD* = 0.24), with minimum and maximum scores of 0.07 and 0.73, respectively.

Table 4.22

Descriptive Analysis for Notes Taken by Chinese and Japanese Participants

Criteria for evaluating notes	*Proficiency*	*n.*	*M*	*SD*	*Min*	*Max*
C1.Total-number-of-notations	Chinese	30	63.63	36.58	15	180
	Japanese	27	82.93	50.28	5	172
C2.Total number of content	Chinese	30	17.90	14.32	0	61
words	Japanese	27	25.59	20.83	0	100
C3.The number of content	Chinese	30	9.53	12.52	0	40
words in L1	Japanese	27	3.33	3.56	0	12
C4.The number of characters in	Chinese	30	2.40	2.94	0	8
L1	Japanese	27	1.26	1.51	0	4
C5.Test-answerability	Chinese	30	0.53	0.24	0.11	0.87
	Japanese	27	.40	.24	.07	.73

One difference was discovered between how the Chinese and Japanese participants took notes. The Chinese listeners wrote more words in L1 than the Japanese listeners F (1, 57) = 6.16, p = .01. The degree of effect of L1 background was found at 0.11, or approximately 11% of the variance in the number of words in L1 was accounted for by difference in L1 background (see Table 4.25). However, the finding revealed no difference in total number of notations between the two groups F (1, 57) = 2.783, p = 0.10 (see Table 4.23). Furthermore, there was no statistical difference in the total number of content words between Chinese and Japanese participants F (1,

57) = 2.68, p =.010 (see Table 4.24). Furthermore, no significant difference was found in the number of characters in L1 between the two study groups F (1, 57) = 3.277, p = 0.07 (see Table 4.26). Lastly, no difference was found in the score of answerability between the two groups F (1, 57) = 4.17, p = 0.04 (see Table 4.27).

Table 4.23

Differences in Total Number of Notations between Chinese and Japanese Participants.

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig*	η^2
L1 background	5289.217	1	5289.217	2.783	0.10	0.04
Error	104532.819	55	1900.597			
Total	411680.000	57				

* Bonferroni adjusted alpha set at $p < .01$ to account for multiple comparisons

Table 4.24

Differences in Total Number of Content Words between Chinese and Japanese Participants

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig*	η^2
L1 background	840.922	1	840.922	2.68	0.10	0.04
Error	17233.219	55	313.331			
Total	44530.000	57				

* Bonferroni adjusted alpha set at $p < .01$ to account for multiple comparisons

Table 4.25

Differences in Total Number of Content Words in L1 between Chinese and Japanese Participants

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig*	η^2
L1 background	546.253	1	546.253	6.16	0.01	0.11
Error	4877.467	55	88.681			
Total	7904.000	57				

* Bonferroni adjusted alpha set at $p < .01$ to account for multiple comparisons

Table 4.26

Differences in Total Number of Characters in L1 between Chinese and Japanese Participants

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig*	η^2
L1 background	18.492	1	18.492	3.277	0.07	0.05
Error	4877.467	55	88.681			
Total	7904.000	57				

* Bonferroni adjusted alpha set at $p < .01$ to account for multiple comparisons

Table 4.27

Differences in Test-answerability between Chinese and Japanese Participants

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig*	η^2
L1 background	0.243	1	0.243	4.17	0.04	0.07
Error	3.201	55	0.058			
Total	16.111	57				

* Bonferroni adjusted alpha set at $p < .01$ to account for multiple comparisons

4.6 Interview Data

All participants were asked a short series of questions regarding their language backgrounds, including the number of years they had been learning English, whether they had studied in an English-speaking country, how they had been trained to process L2 audio materials, and how they had been trained to take notes. All participants (100%) indicated that they had begun learning English in elementary school, while 28% had lived in an English-speaking country (e.g., Australia, the US). The number of Chinese participants who had previously taken TOEFL was the same as the Japanese participants.

Most participants claimed that their EFL teachers seldom asked them to recall the content of L2 audio materials, although they did memorize words and English texts. All participants had been told to use listening strategies to facilitate L2 listening comprehension; for instance, they were asked to focus on the gist, repeated words, complete information units, and contents after linking words in L2 audio materials.

All participants understood that they should take notes while listening to L2 academic lectures, but did not quite understand what they should write in their notes. The researcher interviewed four of participants to a thorough extent (see Appendix E).

Chapter 5: Discussion

Previous researchers have discovered that advanced listeners are adept at using cognitive and metacognitive listening strategies (Vandergrift, 1997; Chang, 2008). Based on the gaps in the previous studies, the present study identified how advanced and intermediate learners of English differ in using specific listening comprehension strategies to facilitate recall. In addition, previous scholars have highlighted differences in the notes taken by L1 speakers of English and L2 learners of English (Dunkel, 1988; Carrell, 2007). In order to enhance the study efficiency of L2 learners of English from different L1 backgrounds, the present study discovered how they differ in note-taking. This chapter introduces the factors contributing to the findings of the present study.

5.1 Differences between Advanced and Intermediate Learners' Use of Listening Comprehension Strategies to Facilitate Recall

First, in the present study, advanced level learners tended to recall content based on complete information units of a lecture. This finding can be explained as follows. First, advanced listeners are more capable of using cognitive strategies (Vandergrift, 2007; Chang, 2008). Focusing on complete information units is an important cognitive strategy, and the advanced participants were more inclined to decode lectures they had heard into several complete information units rather than single words (Goh, 2000). Due to their high proficiency, they understood the lectures, while due to their high working memory capacity, they could recall complete information units of a lecture to complete the listening comprehension tasks.

The intermediate learners self-reported that they were inclined to recall infor-

mation from single and repeated words rather than complete information units, which aligns with Goh's (2000) finding that less skilled learners have problems in chunking and processing the stream of speech. Less skilled learners could not process the stream of speech in a timely and correct manner, and they might only recall single words to facilitate comprehension and recall.

Based on the findings of the study, the L2 learners at high proficiency level preferred to refer to their notes to facilitate recall. According to the correlation analysis in the study, quality of notes was correlated with test performance, which suggests the role of note-taking in the present study. In other words, they could retain information relatively longer and were more likely to figure out the meaning of information units and symbols in their notes, so they could make use of their notes to facilitate recall and complete the listening comprehension tasks. By contrast, in the post-hoc interview, some intermediate learners complained that although they tried to use their notes to facilitate recall, they could not discern the meanings of symbols they had used. This aligns with Goh's (2000) finding that advanced L2 learners have a stronger working memory capacity that enables them to complete cognitive tasks, such as listening comprehension tasks, better.

The study discovered that both advanced and intermediate listeners favored using the gist and contents after linking words to facilitate recall. In the post-hoc interviews, participants claimed that their EFL teachers always asked them to focus on gist and the contents after linking words in a lecture. According to Nissan *et al*. (1996), TOEFL testers always test whether test takers can understand gist and the contents after linking words of a lecture, so it is common for teachers to emphasize the importance of these aspects in class. L2 learners were trained to be aware of linking words, such as "but," "so," and "because," so they paid attention to the contents after

linking words. This result is also consistent with Field's (2008) finding that L2 learners are more likely to pay attention to linking words in audio materials. Although the two study groups self-reported that they seemed to recall information using the gist of a lecture and the content after linking words, their test scores differed significantly. Chang (2008) discovered that both advanced and intermediate learners could be trained to use the same listening strategies; however, there is a wide gap between the effects of using these strategies. Furthermore, Goh (2002) discovered that advanced learners are capable of using metacognitive and cognitive strategies effectively to facilitate L2 listening comprehension, which may explain why both groups self-claimed that they might recall information using similar strategies, but then performed differently in the listening comprehension test.

5.2 Differences between Chinese and Japanese Learners' Use of Listening Comprehension Strategies to Facilitate Recall

According to the findings, there was no statistical difference in the average score of the 13 questionnaire items between the Chinese and Japanese groups, but both groups used different listening comprehension strategies to facilitate recall. This finding could be attributed to the pedagogical training they had received in their home countries.

On the one hand, as Asians, both Chinese and Japanese learners of English may share some similarities in the process of acquiring English. In the post-hoc interviews, both Chinese and Japanese participants maintained that they were required to pay attention to the content after linking words or discourse markers, which is consistent with Flowerdew and Tauroza's (1995) finding that L2 listeners could better under-

stand a lecture with evident discourse markers, such as “so,” “right,” “but,” and “first,” than a lecture without those markers. Thus, they might pay more attention to the content after linking words to complete the corresponding listening comprehension tasks.

On the other hand, L1 background, to some extent, may affect their choice of various listening learning strategies (Oxford, 1996). A number of researchers discovered that English learners from China and Japan might adopt distinct strategies to acquire English (Liu, 2001; Takeuchi, 2003). They may utilize different listening strategies to facilitate their English listening comprehension, so they may use different language learning strategies to recall the contents they have heard.

One of the objectives of the present study was to investigate the differences in use of listening comprehension strategies to facilitate recall between L2 learners from different L1 backgrounds. Based on the descriptive statistical analysis, there were several differences between the Chinese and Japanese participants in the study. First, Chinese participants self-reported that they were more inclined to recall the gist of a lecture. This finding might be explained by tutorials they had received in the past. In post-hoc interviews, the Chinese participants claimed that they were test-oriented and that their EFL teachers often taught them to pay attention to the gist of lectures, which is given in the lecture introduction. This explains why Chinese participants were more likely to recall the gist of lectures.

The Japanese participants preferred to recall single words, repeated words, and the content after linking words to complete the listening comprehension tasks of the test in this study. Although the listening strategies used by Japanese listeners to facilitate recall were similar to those used by intermediate listeners, this does not indicate that Japanese participants were intermediate learners of English. The researcher con-

trolled the variable: In different L1 groups, the numbers of participants with different language proficiency levels were nearly the same. In the post-hoc interview, a number of Japanese learners of English reported that when completing the listening comprehension tasks, they could rely on some single and repeated words to facilitate recall. They maintained that when those words were used amongst the answer options, it might remind them of words they had heard. Under such circumstances, they did not need to refer to their notes. In addition, in the post-hoc interview, the Japanese participants were more inclined to recall repeated words, which perhaps explains the finding proposed by Sakai (2009) that EFL teachers in Japan are accustomed to playing English audio materials repeatedly in class and emphasizing the importance of repeated words in audio materials. Due to their past tutorials, it was not uncommon for Japanese participants to recall repeated words to complete the listening comprehension tasks.

Furthermore, the Chinese participants in my sample preferred to make full use of their notes to facilitate recall. The numbers of Chinese and Japanese participants who had taken TOEFL before the study were equal, which means that this variable was controlled by the researcher; however, their different language learning experiences still exerted an influence on their attitudes toward note-taking. In the post-hoc interview, the Chinese participants claimed that their EFL teachers had taught them to take notes while listening to academic lectures. Furthermore, their EFL teachers always emphasized the importance of TOEFL to them. To achieve high scores, they received test-cracking training at different language training institutions where they learned how to take notes while listening to academic lectures and how to make full use of the notes to recall complete information units of a lecture. In addition, Chinese learners have been found to recognize the role of note-taking in the process of acquir-

ing English (Liu, 2001). Thus, their past language learning experiences could be used to explain why Chinese participants were more adept at recalling contents in the notes they took to complete corresponding comprehension tasks.

5.3 Differences in Notes Taken by Advanced and Intermediate Learners

Target language proficiency level and recall capacity contributed to the differences in notes taken by participants at different language proficiency levels. Previous studies have proposed that the quality of notes taken by L2 learners is strongly correlated with their target language proficiency level (Dunkel & Davy, 1989; Dunkel *et al*., 1993), which may explain why participants at different target language proficiency levels demonstrated differences in their notes. Dunkel (1988) discovered that both L1 speakers and advanced L2 learners could comprehend more detailed information, particularly complete information units, than intermediate participants, so they could write more words in their notes. This finding may explain why advanced listeners in the present study wrote more content words and notations in their notes.

The score for test-answerability of notes taken by advanced learners was higher than that of intermediate learners, and this may be explained by their higher language proficiency level. L2 learners are likely to pay more attention to linking words and discourse markers (Flowerdew & Tauroza, 1995; Field, 2008). In the post-hoc interviews, advanced learners claimed that they paid more attention to the content after linking words and could understand the content, which may explain why they wrote more information after linking words than their intermediate counterparts. Kostin (2004) concluded that most content after linking words can be used to answer the questions in the TOEFL listening comprehension subtest. Due to the fact that ad-

vanced learners wrote more of the content after linking words, their score in test answerability was higher. Although the intermediate learners might understand the importance of linking words, they could not understand the content after linking words, which negatively influenced their score for test-answerability.

Furthermore, when measuring the answerability of participants' notes, the researcher also discovered that the answerability of some intermediate learners was relatively high, but they performed less satisfactorily. By conducting interviews with these participants, the researcher found that they easily forgot what they had written in their notes. This finding suggests the important role of recall in note-taking, which is in line with the finding of Koren (1997) that the ability to recall the content of notes is significant.

5.4 Differences in Notes Taken by Chinese and Japanese Learners

Compared to native speakers, nonnative speakers are at a disadvantage in terms of their target language proficiency level (Buck, 2001). Therefore, one of the aims of this study was to ascertain the differences in notes taken by L2 learners of English from different cultural backgrounds. By perceiving the differences between their notes, the researcher aimed to find some common limitations and distinct advantages in their notes. Although the role of note-taking has been recognized, EFL teachers from different L2 cultural backgrounds may treat note-taking differently. Therefore, learners of English from different L1 backgrounds may have different attitudes toward note-taking.

The Chinese participants in the present study were inclined to write content words in Chinese in their notes. By contrast, the Japanese participants wrote fewer

content words in Japanese in their notes. Translating English information into Chinese remains a dominant teaching method in China. Liu's (2001) study revealed that the role of note-taking in L1 is recognized by Chinese learners of English. Therefore, learners of English in China are more accustomed to this approach, which is why the Chinese participants wrote more Chinese characters in their notes. Also, in Koren's (1997) study, the role of mother tongue was recognized in note-taking. Some L2 learners are inclined to take notes in their mother tongue while listening to audio materials in the target language. Koren's (1997) study claimed that the role of mother tongue in the process of second language acquisition should not be criticized. Therefore, it is reasonable for the Chinese participants in the present study to take notes in their L1.

Furthermore, in the post-hoc interview, they claimed that the words used in correct answer options in the test did not overlap with the words used in the original audio, so they avoided writing the English words used in original audio in their notes. The Chinese participants claimed that focusing too much on original words in audio materials might exert a negative influence on completing the comprehension task, as some of the incorrect answer options might contain those words that were used in original audio materials. For this reason, the Chinese participants used more Chinese characters to take notes, as they hoped this would make them less dependent on the exact words used in the original lectures.

However, Parks (1982) concluded that taking notes in L1 while listening to lectures in L2 requires four steps: perception, semantic analysis, semantic reconstruction, and expression, which are rather demanding tasks. To avoid this cognitive load, some learners of English might be used to taking notes directly in the target language (Parks, 1982). Again, different L2 listeners use different listening comprehension

strategies (Chang, 2008), which is why the Japanese participants seemed to be accustomed to taking notes in the target language to avoid the cognitive burden posed by taking notes in their L1.

In addition, the difference between Japanese and English sentence structures may explain why Japanese participants were inclined to use English to take notes directly. As Hoffer (1969) stated, the basic sentence structure of Japanese is Subject-Object-Verb (SOV), while that of English is Subject-Verb-Object (SVO). Under such circumstances, it might be laborious for Japanese participants to translate English into their L1, as they would need to quickly process audio information and reverse the syntactic structure of one language into that of another language. The Chinese sentence also differs from the English sentence; for instance, there is no auxiliary in Chinese to represent the English *do*. However, the basic sentence structure of Chinese is similar to that of English, that is, Subject-Verb-Object (Xu, 2003). Therefore, it might be easier for Chinese participants to take notes in L1 since to answer the questions they would only have to insert the Chinese words in the same syntactic constructions when they reconstruct the sentence. In conclusion, different attitudes towards note-taking and the sentence pattern of L1 contributed to the differences in the note-taking strategies chosen by Japanese and Chinese participants.

Chapter 6: Conclusions

6.1 Summary of Findings

The present study aimed to discover how listening comprehension strategies and note-taking could be used to facilitate recall in TOEFL. The independent variables used were learners' L1 backgrounds (Chinese and Japanese) and listening proficiency levels (intermediate and advanced). Fifty-seven learners of English (30 Chinese and 27 Japanese L1 speakers) participated in this research. All were required to listen to two academic lectures from the authentic TOEFL listening comprehension test and reported how they recalled the contents processed by using listening strategies when performing the corresponding comprehension task.

The findings of this study indicate that English learners of various listening proficiency levels seem to prefer different listening strategies for recalling information while listening. Advanced level listeners tended to recall information based on gist and complete information units of a lecture. This group also seemed to draw on the content after linking words and content from their notes. On the other hand, lower level listeners in this study were inclined to recall single words and repeated words only.

This study has also revealed how Chinese and Japanese participants recall information using different listening comprehension strategies. Chinese learners of English appeared to recall information based on the gist of a lecture, as well as the content after linking words. In addition, they tended to make use of their notes to answer the comprehension questions. The Japanese participants, on the other hand, preferred to

recall single words, repeated words, and the content after linking words to complete the listening comprehension tasks of the test in this study.

The findings revealed that the test-answerability score of advanced learners was higher than that of their intermediate counterparts, based on analyses that showed that advanced learners wrote more content words and notations in their notes than intermediate learners. This study has also revealed that Chinese listeners wrote more L1 content words in their notes than Japanese listeners.

6.2 Limitations and Suggestions for Further Research

Further studies could consider using techniques for more interactive listening exercises, such as dictogloss. It is impossible to know whether learners' self-reports accurately reflect their real strategy use, and it is equally very difficult to have learners conduct 'think aloud protocol' while listening. Thus, a learner-centered dictation activity such as dictogloss could be used to more accurately gauge 'what is going on' when learners listen and reconstruct what they heard.

Comparison of a dictogloss group and a teacher-centered group may be attempted to investigate both the effect of the dictogloss technique on the learners' performance and the process of recall via this learner-centered activity of reconstructing the text.

In addition, further studies should focus on whether different test formats could affect the recall of contents processed by different listening comprehension strategies. For instance, for L2 learners who intend to further their study in the British Commonwealth of Nations, achieving high scores in IELTS (International English Language Testing System) is vital. The IELTS listening comprehension test allows test

takers to preview the corresponding comprehension questions before the test. The test format differs from that of the TOEFL listening comprehension test. Would test takers of the IELTS listening comprehension test use different listening comprehension strategies to facilitate recall? Would test format be a crucial factor affecting the use of listening comprehension strategies to facilitate recall? These research questions should be studied further.

This study has compared L2 learners from Chinese and Japanese backgrounds. It might be beneficial to compare learners of English from different language backgrounds whose L1 is topologically similar to English, such as German, French, and Italian. As mentioned above, L1 background can affect how L2 learners select language-learning strategies. Influenced by their own L1 background, whether L2 learners of English from different L1 backgrounds demonstrate differences in the use of listening comprehension strategies to facilitate recall and in their notes, deserves to be studied in depth. Discovering the differences in learning strategies and quality of note-taking between L2 learners of English from different cultural backgrounds is important to devise customized curriculums for L2 learners of English from different L1 backgrounds.

The method used in the present study could be improved. The current study utilized questionnaires and post-hoc interview. The use of questionnaires and conducting interviews are considered effective methods for researchers to understand how L2 listeners use listening comprehension strategies. These study methods could make L2 listeners aware of their use of listening comprehension strategies, which may stimulate them to recall how they use and change listening comprehension strategies (Vandergrift, 2007). However, it is easy for L2 learners to report skills, rather than strategies they have used, when they complete questionnaires investigating their use of

strategies (Phakiti, 2003). Listening comprehension strategies are consciously used by L2 listeners to compensate for unknown information in audio materials, while L2 listeners use listening skills unconsciously (Phakiti, 2003). For instance, listeners may decode every detail in audio materials unconsciously and automatically, but they might regard this as a listening comprehension strategy that is used consciously. Thus, researchers should eliminate the possibility of obscuring skills and strategies when designing questionnaires in future studies. Previously, some researchers have asked their participants to write free recall protocols to understand how well they have understood audio materials; however, researchers cannot rely on this method alone to ascertain how participants recall information using listening comprehension strategies and what information in their notes is more likely to be referred to, to complete listening comprehension tasks. Therefore, further study should integrate questionnaires, recall protocols, and interviews to investigate how participants process audio information using listening comprehension strategies and what information in notes is more likely to be referred to by participants.

6.3 Pedagogical Implications

This study aimed to design an innovative curriculum for an L2 listening comprehension class. The role of working memory capacity in the process of acquiring foreign languages has been recognized by a number of researchers (Goh, 2002). However, L2 learners are rarely required to recall what they have heard. In the traditional English listening comprehension class, L2 learners are usually given different types of English listening comprehension material to listen to. Learners of English often claim that they easily forget what they have just heard in English. Given that the importance of

using listening comprehension strategies to facilitate recall has been revealed in the current study, it is advisable for EFL teachers to be aware of this and embed the practice of recalling when setting listening exercises.

As advanced learners often rely on complete information units to facilitate recall, it is highly recommended for EFL teachers to design a new curriculum that combines intensive listening comprehension practice with training in listening comprehension strategies. In other words, a great deal of attention should be paid to training in the intensive listening practice. Nowadays, learners of English are inclined to pursue an effortless way to improve their English listening comprehension competency. Learners of English are fascinated with so-called test-cracking tactics, which may exert a negative influence on their future English study. Therefore, EFL teachers should make their students understand the role of practicing English listening comprehension intensively.

Note-taking should also be recognized as an indispensable part of the L2 listening comprehension class. Given the importance of note-taking, EFL teachers should provide their students with more tutorials on how to take quality notes while listening to academic lectures. At the same time, L2 learners should be informed that taking notes does not mean mechanically writing down all the words they hear. The following are some instructive suggestions proposed by the researcher regarding how to improve the quality of note-taking.

Firstly, L2 note takers should distinguish useful information from meaningless information. It is impossible for note takers to write down all the words they hear. Thus, they should be taught to be more sensitive to the content following linking words. Dunkel (1988) concluded that terseness of note-taking, rather than quantity, is positively correlated to the quality of notes taken by L1 speakers and L2 learners. L2

learners should be trained to distinguish and record contents containing useful information while simultaneously omitting meaningless information. In the TOEFL listening comprehension test, test takers tend to write down all the information they understand. While recording some meaningless information, test takers are likely to miss important information, thus decreasing the answerability of their notes, which, in turn, exerts a negative influence on their test scores. Therefore, in L2 listening comprehension classes, language teachers should enlighten L2 learners on how to distinguish useful information units from meaningless ones.

Furthermore, L2 learners at the intermediate language proficiency level are less adept at using abbreviations and symbols to take notes, or some of them may complain that they often forget the meanings and implications of the symbols and abbreviations they have used. To solve this problem, language teachers should give L2 learners more practice at recall. Since recalling capacity is correlated to test performance, language teachers should encourage L2 learners to recall the contents of their notes. Gradually, their students may become more familiar with their own note-taking style, and are thus more likely to remember the meanings of the abbreviations and symbols they use.

Thirdly, L2 learners should learn how to locate the important information in their notes. For various reasons, L2 learners cannot take advantage of their notes to complete the corresponding listening comprehension tasks. TOEFL test takers may complain that they are not aware that the contents of their notes can be used to answer the listening comprehension questions that follow. On the surface, this issue can be explained by the fact that there may be no overlap between the words used in comprehension questions and the words used in the original audio transcripts. Thus, L2 learners cannot locate useful information in their notes. However, the underlying rea-

son may be that L2 learners cannot comprehend the original audio information or take notes in an organized manner. To solve this problem, L2 learners at different language proficiency levels should be taught to take notes in different formats, including the blank format and the outline format. For L2 learners at the intermediate proficiency level, language teachers should instruct them on how to take notes in the outline format. As they cannot take notes in an organized manner, the presence of an outline may give them some hints. Gradually, they may understand how to take and make full use of notes effectively.

In addition, the role of mother tongue during the process of recalling information in foreign languages should be recognized and promoted. EFL teachers should teach their students how to appropriately use their mother tongue to take notes.

Lastly, in the heyday of globalization, language teachers should be encouraged to become familiar with the characteristics of international students from different L1 backgrounds so that their faculties can be developed further. For instance, with the implementation of the G30 plan in Japan, more and more Chinese overseas students are being admitted to Japanese universities. Meanwhile, in order to be admitted to first-ranking Japanese universities, Chinese overseas students who are proficient in Japanese but poor in English must take TOEFL in Japan. Overseas students from China in Japan encounter tremendous pressure because they must complete their studies, adapt to a new environment, and study at least two foreign languages simultaneously. It is necessary for foreign language teachers to employ different methods to facilitate students' learning of English and teach them how to take notes in foreign languages effectively. Foreign language schools and universities in Japan could devise unique and customized curriculums for foreign students to help them achieve their different learning goals. For instance, for students who must take TOEFL or TOEIC, specific

test preparation courses should be offered, while for those students who do not need to take standardized English tests, courses aiming at improving their English listening comprehension competency should be offered.

Lastly, dictogloss should be embedded in the L2 listening comprehension class. In the traditional listening comprehension class, the teacher-oriented method prevails. Under such circumstances, it is hard for teachers to understand comprehensively how their students process audio materials. Therefore, dictogloss, a student-oriented exercise, should be common in the L2 listening comprehension class. EFL teachers should divide L2 learners into different groups and play them audio materials in the target language. During the process, L2 leaners can take notes. Later, L2 learners in a group can discuss how they recall what they have heard, and what kinds of information may facilitate their recall. By using dictogloss, EFL teachers can observe the characteristics of the pattern used by L2 learners to reconstruct and recall the information they have heard. This student-oriented technique may improve EFL teachers' faculty and enhance the study efficiency of learners of English.

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List of Publications

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Liu, Y-L. (2015).The use of listening comprehension strategies to recall on TOEFL: The case of Chinese and Japanese successful and less successful Listeners. *The Asian EFL Journal, 85,* 117-135.

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Liu, Y-L. Different Motivation of Chinese Students Learning Japanese and English in

Japan. The JACET 54th International Convention. Kagoshima, Japan. (2015).

Peer reviewed.

Scholarship:

The Young Leadership Scholarship sponsored by Tokyo Foundation in 2013

Notes

1 TEM-8 refers to Test for English Majors Grade Eight. It is the most difficult test for Chinese English majors, and is held only once every year. The full mark of the test is 100, and only 30% of the test takers can pass the test. The test consists of five parts: listening comprehension, reading comprehension, translation, proofreading and composition.

Appendix

List of Appendix

APPENDIX A. Actual text

Lecture 1 Octopus (6 questions in total)

4/6 What does the professor say about the function of the papillae?

A. They produce dye in different colors.

B. They propel the octopus through the water.

C. They change the texture of the octopus' skin.

D. They help the octopus contract into a smaller shape.

Lecture 2 Roman sculptures (6 questions in total)

1/6 What is the lecture mainly about?

A Different views of a type of sculpture popular in ancient Roman times.

B Evidence that Romans had outstanding artistic ability.

C The differences between Greek sculpture and Roman sculpture.

D The relationship between art and politics in ancient Roman times.

APPENDIX B. Questionnaire

Questionnaire

Part One: How often did you use the following listening strategies to facilitate recall when choosing your response to each listening comprehension question?

0 1 2 3 4 5

Never Hardly Sometimes Often Usually Always

1) Directed attention: I recalled the gist of the lecture to choose my response. ____

2) Selective attention: I recalled the complete meaning groups in the lectures to choose my response. ____

3) Selective attention: I recalled some single words in the lectures to choose my response. ____

4) Selective attention: I recalled the repeated words in the lectures to choose my response. ____

5) Selective attention: I recalled the content after the linkage words in the lectures to choose my response (e.g. first, second, however, because). ____

6) Voice inference: I recalled the content processed by focusing on the tone of the lecturer to choose my response (e.g. fall and rise tones). ____

7) Academic elaboration: I recalled the content processed by referring to my prior background knowledge to choose my response. ____

8) Imagery: I recalled the picture depicting the content of the lectures to choose my response. ____

9) Structure: I recalled the structure of the lectures in my mind to choose my response. ____

10) Note taking: I recalled the notes I had taken to choose my response. ____

11) Inferencing between parts: I recalled the content processed by making inferences to choose my response. ____

12) Grouping: I recalled the content processed by analyzing the relationship between sentences in the lectures to choose my response (e.g. statement + example). ____

13) Translation: I recalled the meaning groups processed by translating into my mother language to choose my response. ____

Part Two: Personal information

Name: E-mail:

Gender:

Age: Major:

Past TOEFL score: TOEIC score:

For how many years have you studied English?

Have you ever studied in an English-speaking country? A. Yes B. No

Have you taken TOEFL before? A. Yes B. No

Appendix C. Raw data for note-coding

Participant	Proficiency	L1	C1	C2	C3	C4	C5
1	Advanced	Japanese	153	22	1	0	.67
2	Advanced	Japanese	42	22	0	0	.20
3	Intermediate	Japanese	79	33	6	1	.60
4	Advanced	Japanese	127	42	0	0	.60
5	Advanced	Japanese	152	32	0	0	.67
6	Advanced	Japanese	141	32	0	0	.53
7	Advanced	Japanese	172	44	4	2	.73
8	Intermediate	Japanese	150	41	1	0	.60
9	Intermediate	Japanese	96	30	9	3	.40
10	Advanced	Japanese	88	42	6	4	.40
11	Advanced	Japanese	129	39	12	3	.73
12	Intermediate	Japanese	54	37	0	0	.20
13	Intermediate	Japanese	18	6	4	3	.13
14	Intermediate	Chinese	180	30	2	0	.73
15	Intermediate	Japanese	26	0	5	0	.13
16	Intermediate	Japanese	75	12	3	2	.20
17	Intermediate	Japanese	64	17	10	3	.20
18	Intermediate	Japanese	41	12	0	0	.13
19	Intermediate	Japanese	61	19	5	4	.60
20	Advanced	Japanese	142	16	2	1	.67
21	Advanced	Japanese	140	19	5	2	.67
22	Intermediate	Japanese	52	4	0	0	.07

23	Intermediate	Japanese	86	16	9	2	.27
24	Intermediate	Japanese	54	5	5	4	.07
25	Intermediate	Japanese	5	0	0	0	.07
26	Intermediate	Japanese	40	4	2	0	.20
27	Advanced	Chinese	145	28	40	5	.87
28	Advanced	Chinese	106	12	0	0	.80
29	Advanced	Chinese	91	24	0	0	.87
30	Advanced	Chinese	48	36	0	0	.73
31	Advanced	Chinese	54	12	12	3	.77
32	Advanced	Chinese	47	24	0	0	.72
33	Advanced	Chinese	126	61	31	6	.73
34	Advanced	Chinese	78	42	0	0	.80
35	Intermediate	Chinese	62	36	0	0	.73
36	Advanced	Chinese	55	20	22	5	.73
37	Advanced	Chinese	70	38	26	4	.60
38	Intermediate	Chinese	56	13	32	7	.73
39	Intermediate	Chinese	55	13	0	0	.47
40	Intermediate	Chinese	30	13	0	0	.37
41	Intermediate	Chinese	30	9	10	8	.23
42	Intermediate	Chinese	59	19	21	6	.53
43	Intermediate	Chinese	42	5	15	5	.17
44	Intermediate	Chinese	15	1	0	0	.11
45	Intermediate	Chinese	48	2	0	0	.50
46	Intermediate	Chinese	50	8	0	0	.45
47	Advanced	Chinese	65	13	11	4	.40

48	Advanced	Chinese	66	9	32	7	.50
49	Intermediate	Chinese	74	25	10	7	.33
50	Intermediate	Chinese	30	6	0	0	.20
51	Intermediate	Chinese	20	2	0	0	.27
52	Intermediate	Chinese	76	9	3	0	.33
53	Intermediate	Chinese	23	0	0	0	.33
54	Intermediate	Chinese	69	6	0	0	.20
55	Advanced	Chinese	39	21	19	5	.80
56	Advanced	Japanese	40	100	0	0	.73
57	Intermediate	Japanese	12	45	1	0	.40

APPENDIX D. A sample of note-taking

Participant	Proficiency	L1	C1	C2	C3	C4	C5
55	Advanced	Chinese	39	21	19	5	.80

Lecture 1: Octopus

Bio

章鱼 (Translation: Octopus)

防御 (Translation: Defense)

P dious version of octopus

神话 希腊 现实

(Translation: mythology Greek reality)

Change form 狮子 (Translation: lion)

Cha col Ho to cha

Tw co cel 染色 (Translation: dye)

1) Musc 不同,温度 (Translation: different temperatures)

放松 白点 收紧 色彩

(Translation: relax while points contract color)

2) 不同,颜色 (Translation: different colors)

a lot of not ev co

refl the other one

tex and tex

Si Te Third

容易,滑动 （Translation: easy to move） 喷 (Translation: squirt) ink

Lecture 2: Roman sculptures

Ar

Hist

Rom Scul 羡慕 (Translation: admire)

Copies conq was inspired

Of Gr the emp

They couldn`t mak fo their own 抄 (Translation: copy)

Not lac of creat

Adm Gre

Scul

Coi is easy to distr 认识 (Translation: recognize)

皇帝 (Translation: emperor) wors

图像 (Tranlation: image) pu

So comb bot 安 (Translation: safe)

下

头像 变 人头

(Translation: image change head)

APPENDIX E. Raw data for interview

Interview Question	**Participant**	
Are you inclined to use L1 to take notes?	*No.* 29	"I am accustomed to this approach."
	No. 33	"I can take advantage of Chinese to facilitate recall."
	No. 5	"No, I am accustomed to taking notes in English. "
	No. 6	"Taking notes in Japanese is laborious. "
What listening comprehension strategies did you use to recall information?	*No.* 29	**"** I paid attention to the gist of the lecture, as my teacher taught me to do that."
	No. 33	"I paid attention to the content after linking words."
	No. 5	"I relied on repeated words to facilitate recall. "
	No. 6	**"**I relied on some single words to recall information, as those words were used amongst the answer options. They reminded me of information I had heard."