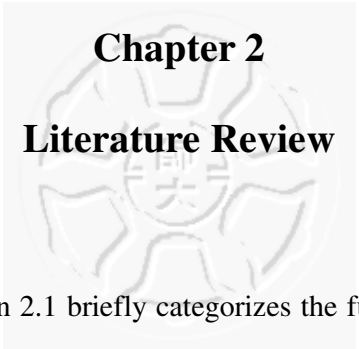




Chapter 2

Literature Review

In this chapter, section 2.1 briefly categorizes the functions of note-taking, and Section 2.2 discusses the effects of note-taking on test performance, and section 2.3 centers on the literature with regards to the use of lectures in listening comprehension. For the purpose of classifying notes, section 2.4 introduces the criteria for deciding good notes, and section 2.5 review studies on the issue of question types. Four related studies are presented in section 2.6. Finally, a summary of this chapter is given in section 2.7.

2.1 Functions of Note-taking

2.1.1 Types of Function

It is generally assumed that students are supposed to take notes while listening to a lecture for a longer retention of learning (DiVesta & Gray, 1972; Faw & Waller, 1976). Based on this assumption, numerous studies (e.g. DiVesta & Gray, 1972; Faw & Waller, 1976; Hale & Courtney, 1994; Kiewra, 1985; Kiewra & Mayer, 1991; Peper & Mayer, 1978; Peters, 1972) have examined the functions of note-taking.

DiVesta & Gray (1972) generalized two major functions of note-taking – encoding and external storage. Encoding refers to a generative process which involves personalized interpretation, association, inferences while listening. External storage serves as a medium for learners to connect themselves with the knowledge they have learned. It is also a resource for later review. Ausubel (1968) advocated a further specification of the function of encoding, which referred to the following two sub-functions – “assimilating new information to a set of meaningful structures” and

“adding new information as arbitrary associations.” Carrier and Titus (1979) specified four specific ways of how note-taking aids encoding: (a) chunking of meaningful information, (b) general level of attention, (c) general effort, and (d) assimilation of new and old information.

To sum up, note-taking is mainly considered to assist learners in interpreting input and evoking learners’ memory of the input.

2.1.2 Superiority of Function

Which of the two types of function possesses superiority over the other in aiding learners’ learning has been a controversial issue for decades. Of the sixty-one studies related to encoding reviewed by Hartley (1983) and Kiewra (1985), thirty-five studies concluded that encoding was indeed facilitative, while twenty-three of them proved that there was no significant relationship between the encoding function and listening comprehension, and three of them even stated that encoding appeared inhibiting. Regarding the general findings on external storage, twenty-four of the thirty-two studies reviewed by Hartley (1983), Kiewra (1985), found that the chance of review indeed led to higher achievement on the test performance, but the rest of them found no significant relationship. Besides, anticipation of the chance of reviewing notes led to increase the amount of note-taking, which later would be expected to improve recall (Kiewra, 1985).

To address this question, DiVesta & Gray (1972) assume that students take notes solely for external storage and examined the functions of note-taking respectively. In their study, six conditions were formed by the interplay of three variables – the position of the criterion passage, the permission of note-taking, and the chance of reviewing notes. Randomly assigned to any condition, the subjects listened to three 5-minute totally unfamiliar passages followed by a 5-minute interval and a

3-minute testing period. The results indicated that although the position of the passage did not exert its influence, the other two variables resulted in significant differences. The immediate opportunity for reviewing notes and note-taking led to a better recall task. Hence, the permission of note-taking demonstrated its positive effect (Barnett, DiVesta & Rogozinski, 1981; Einstein, Morris & Smith, 1985; Peper & Mayer, 1978). That is, the encoding effect outdid the external storage effect.

In spite of DiVesta's positive findings on note-taking, Kiewra (1985) found that external storage was the most crucial factor that enhanced learning rather than the process of recording notes (Annis & Davis, 1975; Fisher & Harris, 1973; Howe, 1970). The provision of complete notes was found to bring about a better performance on achievement tests than self-note-taking (Kiewra, 1985). Kiewra & Dubois (1988) further investigated the effects of different forms of provided notes and test performance. One week after watching a videotaped lecture, forty-four undergraduates were randomly assigned to four conditions – a complete text, outlined notes, matrix notes, and no notes, and were asked to complete a cued recall task and a transfer task. The results showed that the participants with any forms of notes achieved a better performance on the tests than the participants deprived of the chance of reviewing notes. An insight into the data yielded a result that the outlined note group and the matrix group outperformed the text group either on the recall task or the transfer task. This provided a piece of evidence that external storage was regarded as a primary value of note-taking.

Although the previous studies presented a clear-cut dogmatic ranking of the two functions of note-taking, some research showed that the effect of note-taking was manifested under certain conditions (Peper & Mayer, 1978; Peper & Mayer, 1986). Focusing solely on the functions of recording notes, which could help participants pay full attention to the presented material (Fraser, 1970), they were either permitted to

take notes or prohibited from taking notes. Conforming to Peper and Mayer's findings (1978), the results indicated that their note-takers performed better on the far-transfer task which required the participants to integrate and organize the ideas whereas worse on the near-transfer task which simply required verbatim transcription. The results corresponded to the prediction that note-taking activated the participants to generate, integrate, organize the input, which was called the generative hypothesis (Peper and Mayer, 1978). On the other hand, the low-achieving subjects received more facilitation through note-taking which could encourage them to build connection with the material than the high-achieving subjects who had already adopted the strategy of an integrative encoding of the material. Hence, the effect of note-taking greatly interacted with the question type and the ability (Peper & Mayer, 1978).

In addition, Peters (1972) held a different view that note-taking caused the learning process to be interfered (Aiken, Thomas, & Shennum, 1975; Kiewra, 1985; Fisher & Harris, 1974). He examined two variables – note-taking allowed versus note-taking forbidden and the rate of presentation, fast versus normal in his experiment. Eight-two undergraduates involved in the study were randomly grouped into four conditions and were exposed to a social behavior lecture. After analyzing their test performance, no significance differences were found between the note-taking and non-note-taking groups. The non-note-taking group outperformed the note-taking group in making significantly more correct responses. As far as the variation of rate was concerned, no differences were found. Therefore, the results were contradictory to the previous findings. Peters regarded note-taking as a distracter which directed students' attention from comprehending the lecture to recording notes.

External storage was not factually examined itself but mixed with the function of encoding. That is, the participants took notes themselves and were given a chance to review their own notes. Based upon this kind of deficiency, Kiewra & DuBois

(1991) intended to examine the function of storage alone by depriving the participants of the chance to listen to a lecture along with reviewing other's notes. They stated that no difference between non-note-taking control group and note-taking only group without reviewing the notes supported the superiority of external storage over encoding.

Though the functions of note-taking have shown such a controversy, Anderson (1970) questioned the involvement of the function of encoding. Through observing notes, it was found that transformation and elaboration of input were not evidenced in taking notes. Quite a few studies also stated that learners tended to note down the exact words of the input (Howe, 1976; Richards & McCormick, 1988). Therefore, the function of encoding in note-taking has not been settled down yet.

2.2 Effects of Note-taking on Test Performance

Taking lecture notes has long been accepted as a useful strategy in augmenting students' attention and is thus assumed to exert positive effects on test performance. However, in the literature, it remains an issue to be discussed.

2.2.1 Effects of Note-taking in L1 Settings

In L1 settings, the belief that note-taking enhances learning has activated educators to develop study skills programs to teach students how to take good notes (e.g., Armstrong, 1956; Christiansen & Vargata, 1975; Laycock & Russel, 1941; Maddox, 1963; Pauk, 1974; Raygor, 1970; Sotiriou, 1984; Yarrington, 1977).

In spite of the previous belief, the relationship between note-taking and retention has long been an unsettled controversial issue. Some researchers (Arnold, 1942; Eisner & Rhode, 1959; Fisher & Harris, 1974; Howe, 1970; Idstein & Jenkins, 1972; Peters, 1972; Todd & Kessler, 1971) have proved the effect of note-taking to be

interfering in retention of new materials. However, a facilitative effect that contributed to a better retention was recognized in some studies (Aiken, Thomas, & Shennum, 1975; Crawford, 1925; DiVesta & Gray, 1972, 1973; Dunkel, 1988; Hartley & Marshall, 1974; Norton, 1981).

In the history, the first research attempting to examine the relationship between note-taking and test performance was done by Crawford (1925) who conducted his experiment more than 80 years ago. In his study, to compare his subjects' notes and test performance, the subjects were required to take notes during the lecture and took an essay-type quiz afterwards. Crawford proved a positive correlation between note-taking and test performance. In other words, more recorded lecture points indeed yielded more recalled lecture points. Interestingly, the lecture points recorded in the students' notes did not guarantee their performance on the test; however, the possibility that the lecture points not recorded in the notes appear in the test was lower than those recorded. Similar to this finding, Aiken, Thomas, and Shennum (1975) also detected such a tendency that the recorded notes were twice as likely to be recalled as the information that was not taken down.

Besides the positive relationship between note-taking and recall, Palkovitz & Lore (1980) identified a correlation between note-taking and test responses. They concluded that 82% of the correct test responses were highly related with the number of relevant information units in notes. Notes were thus recognized to be connected strongly with test performance (Hartley & Marshall, 1974). Baker and Lombardi (1985) through an investigation into students' note content found that recorded information that was related to postlecture test questions did not lead the subjects to choose an incorrect answer. The notes present in the subjects' notes helped the subjects make correct responses. Though the previous positive relation between recorded information and test performance has been widely recognized, Norton (1981)

contended that no significance was found in comparing test scores and the number of information units.

In addition to considering information recorded in students' notes, the total number of words has also been examined in relationship with comprehension (Norton, 1981). Norton reported a significantly statistical correlation between the number of words and test performance. In his study, he intended to examine the lasting effect of students' notes three weeks after they were taken. He uncovered that the number of words was statistically significantly related to test scores. Contrary to his findings, Dunkel (1988) found that the greater number of words did not result in a higher predictability of the subjects' test performance and he further stated that there were no criteria which could predict L1 subjects' test performance.

Different from the previous studies, note-taking has been found to exhibit interfering effects on test performance (Ash & Carlton, 1953; Aiken, Thomas, & Sheuum, 1975; Peters, 1972).

McLeish (1968) found that the subjects without taking notes while listening to a lecture significantly outperformed those who either took detailed notes or outlined notes. Different reasons have been proposed to justify it. One of the reasons is that learners may not be able to catch the main points while they were busy taking notes (Peters, 1972). Another reason is that learners benefited from note-taking only under the circumstance that the delivery rate was slow (Peters, 1972). In addition, the learners' attention span might not be able to handle two tasks – listening and writing simultaneously (Trayor, 1985). Kiewra & DuBois (1991) proposed that note-taking process in fact involved more than the mere act of note-taking, that is, the subjects had to take care of spelling, grammar, and notational style at the same time.

Besides the above issues, some researchers (e.g. Hartley, 1976; Hartley & Cameron, 1967; Hartley & Fuller, 1971; Maddox & Hoole, 1975) examined the gender

variable. Fisher & Harris (1974) reported that females significantly outperformed males in the recall task but they did not discuss whether females took more notes than males.

2.2.2 Effects of Note-taking in L2 Settings

As English teaching prevails in the world, increasing attention has been directed to L2 learners' test performance. Due to the fact that there is no insight into how note-taking functions serve in response to oral lectures, numerous studies (e.g. Benson, 1989; Connor, 1984; Dunkel, 1988; Dunkel & Davy, 1989; Dunkel, Mishra, & Berliner, 1989; Lin, 2005) have then been conducted to examine the relationship between L2 learners' note-taking and their test performance.

Some researchers focus on whether the chance of note-taking indeed facilitates subjects' learning (Dunkel, Mishra, & Berliner, 1989; Lin, 2005). Lin (2005), for example, examined the relationship between the question type of listening comprehension and note-taking. It was found that the subjects' note-taking strategy had a significantly positive impact on their listening comprehension. However, Dunkel, Mishra, & Berliner (1989) found note-taking did not exert its significant effect. The researchers compared L1 learners and L2 learners to find out how the act of taking notes influenced them. To fulfill this study, 136 native and 123 non-native speakers were recruited and instructed to take notes or not to take notes during the lecture. The results showed no differences between the two groups and the researchers further stated that the act of note-taking did not enhance the learners' comprehension and instead, the review of the learners' notes could facilitate learning.

Ultimately contrary to the positive findings, Hale & Courtney (1994) found that note-taking inhibited L2 learners from gaining a better comprehension in TOEFL tests. Approximately, 563 international students participated in their study and were

exposed to six mini-talks drawn from a TOEFL test with its designed comprehension questions. The subjects were required to take notes while listening and were asked to take the test later. The results indicated that note-taking did not significantly enhance the learners' test performance and it even affected their listening comprehension. The researchers discussed such a phenomenon from the following viewpoints. First, the speedy delivery rate prevented the act of note-taking from demonstrating its facilitative effects (Peters, 1972; Locke, 1977). The delivery rate in TOEFL mini-talks was 145 words per minute, which was regarded as a moderate rate of speech by Peters (1972), and Hale & Courtney inferred that it was too fast to facilitate the subjects' comprehension through note-taking. Second, they attributed this result to the nature of mini-talks – a shorter length. Compared with a lecture which endured for several minutes, TOEFL mini-talks only lasted one to two minutes. The short texts might allow the subjects to depend on their short-term memory and caused them to feel note-taking was redundant. Third, the questions used in the TOEFL tests were mainly intended for retrieving the subjects' general inference instead of trivial information. Finally, Hale & Courtney in the end suggested that if note-taking was permitted in TOEFL, some modifications should be made (1) longer length, (2) regular insertion of pauses to allow participants to take notes, and (3) different questions that aims at other types of information.

Some studies aimed at taking a closer look at the subjects' note content. For example, Dunkel (1988) compared L1 and L2 subjects' performance in relation to their notes. For the mixed group of L1 and L2 subjects, only test-answerability was found to be the only though slight predictor among the five criteria adopted by him. Regarding the L2 group, in the statistical analysis, the frequency count of the information units combined with the total-number-of-words score contributed to more prediction of test performance. However, the same as the L1 group, the

total-number-of-words score alone evidenced a negative correlation with the test performance. This finding was different from Hartley & Marshall's (1974) and Kiewra & Fletcher's (1984) claim that note-taking quantity equaled note-taking quality. Except for these findings, the other criteria displayed no predictability for the subjects' test performance.

2.3 Use of Lectures in Listening Comprehension Tests

Since English has gradually come to serve as a medium of learning at the tertiary level worldwide, comprehending English lectures therefore has received increasing attention (e.g. Benson, 1989; Cook, 1975; Coulthard & Montgonery, 1981; Decarrico & Nmattinger, 1988; Flowerdew & Miller, 1992, 1996; Richards, 1983). To discuss this issue, some research has been conducted to examine the differences between spoken and written language (Brown, 1978; Decarrico & Nmattinger, 1988); some research concentrated on students' perceptions of lecture comprehension (Flowerdew & Miller, 1992) while some on lecturers' perceptions of lectures (Flowerdew & Miller, 1996); some research conducted a case study to gain an insight into how ESL students perceive English lectures (Benson, 1989).

2.3.1 The Nature of Lectures

The lecture is characterized by its formality. Concerning the degree of formality of lectures, Tannen (1982) claimed that all the texts can be distributed along a continuum with two extremes – informal and formal. Informal texts can be represented by natural spoken texts while formal ones can be referred to literal forms of language. Shohamy & Inbar (1991) followed Tannen's contention and further distinguished three text types – the news broadcast, the lecture, and the consultative dialogue which are allocated on the continuum ranging from the most formal to the

least formal. Their results indicated that the students found the consultative dialogue and the lecture were more listenable than the news broadcast which was the most formal. The scores of the students showed a negative correlation with the degree of formality. This phenomenon could be accounted for by considering the number of redundant utterances incorporated in the texts. More redundancy yielded more informality.

Due to the nature of the lecture, Fox (1999) assumed that learners would comprehend dialogues better than monologues. This assumption has been empirically supported (cf. Chen, 2003; Eykyn, 1992; Lin, 2005; Shohamy & Inbar, 1991; Su, 2003; Teng, 1998). Dialogues are generally claimed to be more listenable than monologues, which again manifests the lecture, a kind of monologue, is challenging in nature.

In addition to possessing the intermediate degree of formality in lectures themselves, Brown (1978) investigated and analyzed the variances between spoken and written languages. He claimed that the difficulty of understanding spontaneous speeches lied in the attribute of its flashing by, which failed to enable the learners to listen again. It was found that the attempt to keep up with each produced word in comprehending lectures would simply lead the learners to a failure in gaining the whole picture (Brown, 1978).

2.3.2 Lecture Styles

According to Lebauer (1984), though equipped with high proficiency in English, advanced students are generally struggling with a greater effort to fully comprehend each point in lectures. As stated in Dunkel & Pialorsi (1982), the need of instructing key words, gist, and outline forms should be highlighted as a solution to this problem. Young & Fitzgerald (1982) resorted to the instruction of discourse markers to signal

the listener the flow of the lecture. The abundance of formulaic expressions as an indication of the organization of the lecture turned out to be a unique nature of lectures (Becker, 1975). These formulaic expressions, serving as macro-markers, function as topic markers, topic shifters, summarizers, exemplifiers, relators, evaluators, qualifiers, and asides (DeCarrico & Nattinger, 1988).

On the basis of the previous studies, variations of formulaic expressions contribute to three different lecture styles (DeCarrico & Nattinger, 1988; Dudley-Evans & Johns, 1981). One is the reading style which sounds like lecturing while referring to notes at the same time. Another is the rhetorical style which appears like a performance that is most frequently found on videotaped lectures. The other one is the conversational style in which the speaker interacts more frequently with the audience and presents more informally.

The three different styles differentiate themselves in adoption of the macro-markers (DeCarrico & Nattinger, 1988; Dudley-Evans & Johns, 1981). For example, in terms of topic markers, the reading style utilizes “Let me start with,” while the rhetorical style may adopt “I’ll be talking to you about” and the conversational style may use “Let’s look at.”

2.3.3 Problems and Strategies in Second Language Lecture Comprehension

As far as lecture comprehension is concerned, different approaches have been conducted to ESL learners’ lecture comprehension. Most researchers (Cook, 1975; Coulthard & Montgomery, 1981; DeCarrico & Nattinger (1988); Montgomery, 1977; Murphy & Candlin, 1979; Olsen & Huckin, 1990) applied discourse analysis to their investigations. Chaudron & Richards (1986) adopted the psycholinguistic approach. Besides, Malley, Chamot, & Kupper (1989) adopted a learner strategy approach and Benson (1989) chose an ethnographic one.

Flowerdew & Miller (1992) investigated learners' perceptions, problems and strategies by means of the learner strategy approach. Thirty Hong-Kong, Cantonese-speaking students were recruited to listen to lectures in English as their course proceeded. After each lecture, the subjects were asked to complete self-rating to report how much they comprehended on a scale of 1 to 9. Besides, they had to keep a diary in which they had to reveal their perceptions, problems, and strategies. The results indicated that there was a general tendency that the learners rated themselves at more than five points, showing that they understood the lectures mostly. It is noteworthy that in Lectures 4 and 6 the subjects tended to rate themselves higher than usual. In their diaries, they stated the major reasons for this considerable increase were the slower delivery speed of a substitute lecturer and a change in the lecturing style of another substitute lecturer respectively.

To explore students' perceptions of the purpose of lectures, Flowerdew & Miller (1992) found that half of the learners regarded lectures as a medium to convey fundamental information whereas others considered that lectures were intended for conveying a broader picture. Most of the learners, on the other hand, valued the importance of receiving facts more than opinions, which is different from Brown's (1978) findings. Talking about the facilitative strategies by the lecturer to enhance the learners' comprehension, the learners in their diaries demonstrated the following – (a) overall clarity of presentation, (b) systematic presentation of main points, (c) responding to specific questions, (d) initiating interaction with the class, (e) repetition, (f) the use of visual aids, and (g) a short rest within the lecture. Flowerdew & Miller (1992) further discussed the problems confronted by students. The major problems were (a) speed of delivery, (b) new terminology, (c) difficulties in concentrating, and (d) problems related to physical environment. This discovery exhibited a great many similarities in Lin (2005), who retrieved the responses to the difficulty they

encountered from the subjects. The triggered responses are listed in order of frequency from high to low: (1) lack of concentration, (2) limited vocabulary, (3) inability to identify the key points, (4) limited memory capacity, (5) speed, (6) unfamiliar with the topic, (7) missing other important information while taking notes, (8) deficient time to answer, (9) length of the text, (10) nervousness, and (11) others. Similarly, attention, limited vocabulary, and speed were both considered great challenges to the students while listening. Not surprisingly, in Powers (1986), these responses were mentioned along with such difficulties as (a) deducing the meaning from the context, (b) understanding informally structured lectures, (c) identifying the role of discourse cues, (d) following different modes of spoken lectures, (e) following different modes of audio lectures, (f) recognizing irrelevant matter, and (g) recognizing the function of such features as a change of pitch and sentence stress.

Flowerdew & Miller (1996) continued their previous research to survey the perception of the lecturers. To conduct this study, they recruited ten native speakers of English at City University in Hong Kong. During the research period, the data were gathered in the following ways (a) pre-course interview, (b) lecturer log, (c) post-course interview, (d) field notes, (e) observations of lectures, and (f) student comments. In the pre-course interview, it was found that among all kinds of forms of instructions, the use of lecture was generally agreed upon as the most effective and important medium in conveying information. As to the purpose of lectures, some focused on critical thinking skills, some on relating theories to practice, others on expressing basic facts. Most of them admitted that their linguistic problem was the biggest challenge to the students. Similar to the findings (Flowerdew & Miller, 1992; Lin, 2005; Powers, 1986), delivery speed, and vocabulary were recognized as the students' greatest difficulties. Apart from linguist problems, some lecturers mentioned that active participation was another obstacle, which can be explained in the way that

asking questions or challenging the instructor was considered face-threatening. When it comes to problems related to lecturers, the following factors are generally discussed: (1) speed of delivery, (2) vocabulary and specialist terminology, (3) constraining effect of student learning style, (4) cultural problems, and (5) students' attendance, lateness, and indiscipline. Interestingly, the lecturers were found that they were speaking too fast and often amazed when they knew the students in fact did not know the words they used. This finding corresponds to the previous studies (Flowerdew & Miller, 1992; Lin, 2005; Powers, 1986). Confronted with these problems, the lecturers reported the way they compensated for the learners' inability. They adopted the strategies such as use of visual aids and handouts, modification of language, use of examples, obtaining audience feedback, verbal feedback, non-verbal feedback, and empathizing.

To sum up, for both lecturers and learners, delivery speed and vocabulary can hinder learners' comprehension of lectures. Other than the proficiency factor, personal factors such as learners' cultural backgrounds and concentration may pose another threat to learners' comprehension.

2.3.4 Factors Affecting Academic Lecture Comprehension

In second language acquisition, personal factors such as interest and prior knowledge have long been investigated in relation with the learner's performance (Cheng, 1996; Jennins, Fox, & Graves, 1999). In academic lectures, prior knowledge unexceptionally has been recognized to exert influence in processing academic lecture. The established schemata serve as a guide that leads recipients to making predictions about what message they will receive in discourse (Brown and Yule, 1983). Schemata generally have been classified into two major categories in association with comprehension – textual and content. Textual schemata relate to the knowledge of a

discourse frame, that is, brings out the discourse-level convention while content schemata link themselves to the recipient's life experiences and activate the recipient's relevant event knowledge (Teng, 1997). In the process of comprehension, schematic knowledge provides key information as to build up the whole picture. Anderson & Lynch (1988) pointed out that the lack of such key information might hinder learners' comprehension. The interaction between schemata and comprehension of either written or spoken texts has been considered as an indispensable element since the activation of existing knowledge facilitates the reception of new information.

Quite a few studies have examined the relation between topic familiarity and listening comprehension. Weissenreider (1987) claimed that learners of Spanish, in the task of listening to news, were greatly influenced by their degree of familiarity with a certain news topic. That is, the higher degree of familiarity of a certain event would benefit students' understanding about news broadcasting. Dunkel (1988) further stated that a certain topic biased against learners who were never exposed to it while it might facilitate learners possessed of such knowledge in comprehension. In the study, Middle-Eastern students were found to easily access themselves to the understanding of pyramids. On the contrary, this topic discriminated against other ethnic groups, which led to their difficulty in perceiving the message. Likewise, Schmidt-Rinehart (1994) found that in spite of different proficiency levels, learners' background knowledge played a significantly important role in the task of listening to a native speaker's impromptu speech. Regardless of their levels, their familiarity with a topic contributed to the variation of comprehending different topics.

Some studies further examined how one specific aspect of prior knowledge interplays listeners' comprehension. Chiang & Dunkel (1992) conducted an experiment to clarify the correlation between prior knowledge and listening

comprehension. To control the variable of prior knowledge, they set up two topics – *The Amish People* and *Confucius and Confucianism*, which themselves differ considerably in familiarity for ESL Chinese students. The comprehension check was conducted by means of a 30-multiple-choices question sheet. The results showed that the Chinese students did significantly better on the topic, *Confucius and Confucianism*. In addition, religious knowledge was identified to exert influence on learners' listening comprehension (Markham & Lathan, 1987). In the experiment, Christianity and Islam were the respective themes of the two listening passages for the participants composed of Christians, Moslems, and other-religion groups. Similarly, religious backgrounds were proved to be a factor that affected the learners' listening comprehension.

2.4 Criteria for Deciding Good/Bad Notes

Researchers have come up with different criteria to evaluate learners' notes and examine the relationship between the criteria and test performance (e.g. Chaudron, Loschky, & Cook, 1994; Dunkel, 1988; Nye, 1978). Nye (1978) developed three criteria: (a) content, (b) layout, and (c) legibility of students' notes. Dunkel (1988) later introduced the following criteria (a) the total number of words, (b) the number of information units, (c) test-answerability, (d) completeness, and (e) efficiency. These criteria are introduced in the following sections.

2.4.1 Total of the Words

The total of the words equals a summation of any forms taken down in subjects' notes, including words, symbols, abbreviations, and graphics. Nye (1978) found a small yet significant positive correlation between the number of words and test scores. Norton (1981) also adopted this criterion to examine its relation with his subjects' test

performance and concluded that the total of the words could significantly index the subjects' test performance. This statement however was not supported by other studies. Howe (1970) found that fewer words in the subjects' notes contributed to a better performance on recall, which was contradictory to the previous findings. Unlike the two assertive statements, both Dunkel (1988) and Chaudron, Loschky, & Cook (1994) contended the total of the words could not significantly predict their subjects' test performance. It is suggested that writing as much as possible might not result in any effective performance (Dunkel, 1988). Dunkel (1988) found that the measurement of the total number of words was inversely correlated to the subjects' test performance. The interpretation of such result could be that the training of dictation drove L2 learners to jot down as much as possible instead of digesting what they had heard first and synthesizing the points.

2.4.2 Information Unit

An information unit is defined to be a separate assertion that contains the smallest unit of knowledge that can be judged as true or false (Anderson, 1980). This criterion has long been utilized in judging so-called good notes. Crawford (1925), in an attempt to relate students' note content to test performance, first adopted such a concept. It is contended that the absence of a lecture point decreased the chances to recall (Crawford, 1925). Hartley and Cameron (1967) and Howe (1970) further provided precise directions in incorporating this criterion. They suggested that a lecture transcript should be divided into information units and awarded one point for each information unit even though there was only one word of reference to it. Fisher & Harris (1974) found that more information units in their subjects' notes brought about a better recognition score. This finding was supported by Palkovitz & Lore's (1980) and Baker & Lombardi's (1985) studies. Nevertheless, Dunkel (1988) did not

find such a positive correlation but he proved that this criterion had no significant predictability over test performance. Similarly, Chaudron, Loschky, & Cook (1994) did not identify a positive correlation, either. Unlike the above mentioned studies, Nye (1978) did not view all the information units as equal but categorize them into two types – main points and minor points. Interestingly, it was ‘minor points’ not ‘main points’ that were positively related to the subjects’ test performance (Connor, 1984).

2.4.3 Test-answerability

According to Hartley & Marshall (1974), test-answerability is referred to as the number of information units in subjects’ notes that are useful in answering test questions. Dunkel (1988) proved this criterion to be a predictor of both L1 and L2 subjects’ test performance on the recognition of lecture concepts even though such a relation appeared to be eligible. Chaudron, Loschky, & Cook (1994) also adopted this criterion but failed to detect any effects exerted by test-answerability in the immediate recall task and further suggested that a delayed recall should be conducted to examine its effects.

2.4.4 Efficiency

Efficiency is the number of recorded information units divided by the total of the words (Dunkel, 1988). Finding that the subjects who noted down fewer words performed better than those who noted more, Howe (1970) suggested the factor of “efficiency,” which mainly pointed out how efficient the subjects could be by jotting down the fewest words which, however, can embed the most information units. Aiken, Thomas, and Shnnum (1975) evaluated their subjects’ notes by means of this criterion in two settings – spaced and parallel note-taking conditions. Their results supported Howe’s (1970) statement that the more efficient subjects were, the better they

performed. Dunkel (1988) contradicted this finding by indicating that no significance was found when the subjects' test score was evaluated by efficiency. Chaudron, Loschky, and Cook (1994) also suggested no significant positive relation.

2.4.5 Completeness

Completeness is a proportion of the coverage of information units in comparison with the total number of information units. Locke (1977) analyzed college students' notes taken in actually registered courses along with their final course grades and found a significant positive correlation between completeness and course grades. But Dunkel (1988) did not hold this view and stated that the completeness score did not improve prediction of performance. Later, Chaudron, Loschky, & Cook's (1994) findings corresponded to Dunkel's results.

2.4.6 Other Criteria

Chaudron, Loschky, & Cook (1994) examined the interaction between the quality of notes, the quantity of notes, and test performance. They provided a further distinction among the criteria by classifying them with two categories – quantity and quality. The quantity of notes was decided by the number of total words and total information units in notes. The quality was evaluated on the basis of efficiency, completeness, test-answerability, level of information, and organizational features. With such a distinction, it was hypothesized that the quality of notes would surpass the quantity of notes (Dunkel, 1988). In addition to the five criteria mentioned previously, Chaudron, Loschky, & Cook (1994) added the level of information and organizational features. The level of information refers to the hierarchy order of higher-level information (i.e., major information) and lower-level information (i.e., minor information) and their proportion. With regards to the organizational features,

outlining, diagrams, symbols, numbering, evidence of examples, titles are all considered as shown in Table 2-1.

Table 2-1: Measures of Quantity and Quality of Notes

Quantity	Quality
Total of the words include abbreviations, symbols, etc. They may be counted separately.	Efficiency A. Ratio of information units to total words B. Verbatim versus telegraphic or abbreviated forms
Total information units	Completeness Ratio of total information units to main information units in text Test-answerability Number of information units pertinent to test items Level of Information Number and proportion of high order information relative to low order from text Organizational Features A. Outlining B. Diagrams C. Symbols D. Numbering E. Evidence of examples F. Titles

2.5 Question Types Used in Listening Comprehension Tests

2.5.1 Test Formats of Question Types

The design of comprehension questions has long been a major tool to fulfill the purpose of obtaining a comprehensive picture of learners' comprehension process. Hadley (2001) illustrated a continuum (see Figure 2-1) to explain how question types

might retrieve various kinds of information. In her model, the two ends represent divergent or global and convergent or discrete-point separately. On the continuum from global to local are title and summary statement selection, summary of message content in native language, choosing pictures, listening for specific semantic information, and listening for specific grammatical or lexical features.

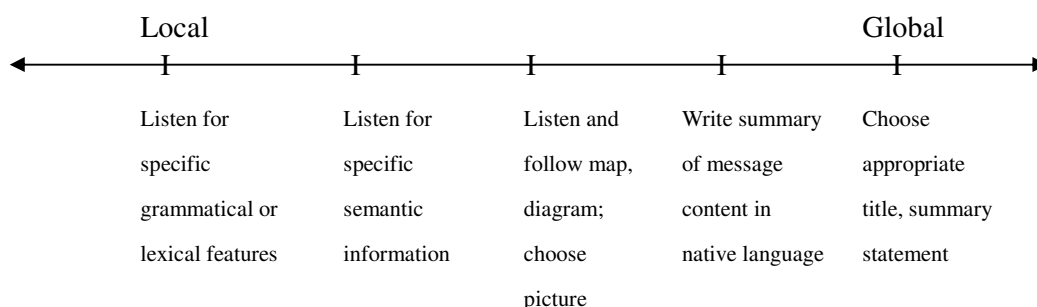


Figure 2-1: Positions of Sample Listening Comprehension Formats

Shohamy & Inbar (1991) categorized the comprehension questions into three – global, local, and trivial. According to Van Dijk & Kintsch (1983) global questions are questions that require learners to integrate information, identify causal relationship, draw conclusions and make inferences, and local questions are questions that require learners to paraphrase and recognize facts, locate details and figure out single words with contextual support. To them, trivial questions are factually subsumed under the category of local questions and are closely related to numerical details, names, and information that is not directly associated with the main topic.

2.5.2 Difficulty Levels of Questions

With the distinction of question types mentioned previously, Shohamy & Inbar (1991) examined the relationship between question types and proficiency. They asked 150 twelfth grade EFL learners in a high school to listen to two passages on different

topics in different text types. The subjects were allowed to preview the open-ended questions composed of three global, two local, and two trivial questions and then listened to the passages twice. The results indicated that most subjects handled questions dealt with local cues better than with global information. In other words, global questions displayed a greater difficulty than local questions. According to Shohamy & Inbar, in processing information, local information was easier to access than global information which required macro strategies. They found that the high-proficiency subjects applied knowledge-based or top-down strategies to comprehend while the low-proficiency subjects relied on data-driven or bottom-up strategies. This finding explained why the low-proficiency learners and the high-proficiency learners performed better on local questions. The finding also conformed to Hildyard and Olson's (1982) statement that the efficient learners mostly adopted a top-down mode of text processing while the low achievers contrarily were more dependent on a bottom-up mode. It was also found that success in global comprehension ensured success in local comprehension but not vice versa.

Though Shohamy & Inbar (1991) claimed that responses to local questions were more readily attainable than global questions, Chen (2003) presented contradictory findings in comparing these two question types. Her subjects were 32 students from two classes – one was a “second major” class and the other was a class of government employees in the extensive program of the government employees. All the subjects were classified into three levels according to their performance on a TOFEL test. Three progress tests and one achievement test were collected for data analysis. The results showed that either in the progress tests or in the achievement test, all the subjects of the three levels performed better on questions about global information than on those retrieving local cues. By taking a closer look at the advanced and intermediate groups, both groups achieved perfection in the tasks

involving global information while this was not the case in the tasks concerning specific information. It was found that the subjects did better in the task types without involving the writing skill such as checking, and picture numbering. When the subjects encountered the task types such as blank-filling, error correction, which involved writing, their performance was not good. In other words, whether the tasks examined global or local information, the subjects perceived the tasks involving only listening easier than the ones with writing.

Contradictory voices about the difficulty level of question types indicate that the effect of question types on listening comprehension indeed requires further research.

2.6 Related Studies

2.6.1 Chaudron, Loschky, & Cook (1988)

For first language learners, note-taking has been identified with two major functions – encoding and reconstruction. Following this line, Chaudron, Loschky, and Cook (1988) explored how the two major functions interacted with second language learners' input processing. Two research questions therefore were proposed to be the primary theme of their study: how retention of notes exerted influence upon the test performance and how quality of notes affected listening comprehension.

In order to gain a comprehensive understanding of these two research questions, 98 adult students who were enrolled in a listening program at a university were recruited and were given three academic lectures of a 7-minute length. Immediately after the lectures, comprehension was examined through twenty four-option multiple-choice questions and twenty-item cloze tests. In the mean time, half of the participants were randomly selected to retain their notes while the other half completed the test without their notes. Afterwards, for the purpose of deciding the

quality of notes, all the note papers were collected and evaluated by measures such as title, numbering, outline, examples, verbatim, diagrams, symbols, abbreviations, and words.

The results showed that there was no significant difference between the note-retention group and the non-note-retention group in their test performance. This result could be attributed to the immediate recall of the content, which might allow the participants to rely heavily on the short-term memory rather than their notes. Therefore, the retention of notes failed to display any significant influence.

As far as the quality and the quantity of notes were concerned, for all the participants, few significant correlations with the test performance were recognized. Interestingly, only the group that kept their notes exhibited correlations with their listening comprehension while the other group failed to display any correlations, which suggested that the participants were referring to their notes while answering questions.

Detailed examination of the participants' notes and their test responses demonstrated that accurate and unambiguous notes would affect the reconstruction of the lecture content. This demonstration showed that notes were justified to have some value in reconstruction though no significant effects were evidenced.

2.6.2 Dunkel, Mishra, & Berliner (1989)

In *Effects of Note Taking, Memory, and Language Proficiency on Lecture Learning for Native and Nonnative Speakers of English* (Dunkel, Mishra, & Berliner, 1989), the effects of note-taking upon native speakers and nonnative speakers were further explored. Dunkel et al. investigated to what extent note-taking facilitated native speakers' listening comprehension and recall of lectures. Apart from this, their study also examined what impacts note-taking imposed upon non-native speakers'

listening comprehension and recollection of information.

One hundred and thirty-six native speakers and 123 nonnative speakers, all of whom registered in freshman English composition, were recruited. At the onset, the Wechsler Intelligence Scale for Children-Revised was administered to obtain their short-term memory capacity. All the participants were randomly assigned to either the only-listening group or the listening and note-taking group. The lecture which lasted slightly more than 20 minutes was given. Afterwards, a 30-item multiple choice was distributed to test the participants' comprehension without reviewing notes.

The results showed that the chance of taking notes while listening did not significantly influence the participants' grasp of the lecture concepts. In addition, it was found that the capacity of short-term memory indeed contributed to some significant differences. Those with high short-term memory outperformed those with low short-term memory by recognizing more information. Moreover, language proficiency was found to be another factor that resulted in the difference as native speakers surpassed non-native speakers through identifying more lecture concepts.

Such findings apparently displayed a contradiction to the encoding hypothesis (DiVesta & Gray, 1972). Note-taking failed to exhibit facilitative effects upon the participants' immediate recall indicating the importance of note reviewing. It was generally assumed that a chance to review notes rather than a chance to take notes served as a key factor to augment learning.

Concerning the last factor – language proficiency, with the influence of nonnative speakers' mother tongue, cognitive competition among languages would be likely to interfere their learning.

Finally, the researchers proposed that individual differences would be an area worthwhile to explore to gain a comprehensive picture of listening comprehension.

2.6.3 Dunkel and Davy (1989)

In their study of *The Heuristic of Lecture Note-taking: Perceptions of American & International Students Regarding the Value & Practice of Note-taking* (Dunkel & Davy, 1989), Dunkel and Davy intended to explore the relationship between note-taking and lecture comprehension. As the pervasion of lectures did not complement with deeper investigation of note-taking, they sought answers to the following research questions: 1) Does note-taking facilitate American students' and international students' lecture learning? 2) Does any specific type of lecture lead to more of note-taking? 3) What technique do American students and international students adopt to encode the lecture? 4) Are there any students who were trained to take notes?

The participants were 164 students (101 international students and 54 American students) recruited from the Pennsylvania State University and they were required to fill out a questionnaire consisting of 20 yes-no questions and 4 open-ended questions.

The results showed that there were indeed some significant differences between the two groups of participants. First, the international students felt that they lacked adequate note-taking skills while the American students displayed more of satisfaction with their skills. Second, significantly different from the American students, the international students found that while they were taking notes, they felt a great sense of time pressure. Third, more than 80 percent of the American students agreed that different types of lectures yielded a different amount of note-taking; however, only 50 percent of the international students answered "yes." Fourth, regarding their pre-training, a greater number of the American students received note-taking training than the international students.

The analysis also evidenced that there existed a consensus between the American students and the international students. Concerning the reason for

note-taking, both groups regarded note-taking as a useful tool to enhance learning. They did not think note-taking could replace the review of the text itself. They did not doodle instead of note-taking and they did not possess any skillful techniques to take notes.

Looking solely into the international students deeper, different culture groups had reached an agreement in terms of the following aspects. They all considered it a great challenge to take notes in English. They showed a greater preference for taking notes in English while listening to an English lecture. Without the American students' language proficiency, they agreed that they needed more time to process the given information.

As far as the four open-ended questions were concerned, both similarities and differences were found between the two groups of participants. For the first research question, the international students provided a greater number of motifs of taking notes than the American students but both of them viewed note-taking mainly as an indispensable device to recall their memory. As to the second research question, the factors that influenced the amount of their note-taking were 1) their interest in the lecture, 2) the organization and visual aids of the lecture, and 3) the relevance to the exam content. With respect to the third research question, they adopted some techniques such as simplifications through symbols, abbreviations, and key phrases. Concerning the last research question about their training in note-taking, most of the participants reported that note-taking was usually incorporated into a course.

2.6.4 Lin (2005)

Lin (2005) examined the relationship between note-taking and listening comprehension. Text types, note content, and topic saliency were set as variables to be investigated in relation with learners' listening comprehension. Thirty-one English

majors who enrolled in Intermediate Aural-Oral Training in English were recruited. The participants were required to take six TOEFL practice tests, each of which consisted three parts – conversations, mini-talks, and lectures. Three of them were administered under the setting of note-taking while the other half under the setting of non-note-taking. After the tests, a questionnaire concerning learners' perception of note-taking followed along with interviews with the students.

It was found that note-taking was positively correlated with listening comprehension. That is, the participants performed significantly better under the setting of note-taking than that of non-note-taking. This finding conformed to quite a few studies (Crawford, 1925; DiVesta & Grey, 1972; Fisher & Harris, 1973; Hartley, 1983; Howe, 1970; Teng, 1996; Weiland & Kingsbury, 1979). When the three parts were examined separately, the results showed that not all the parts in comparison reached a significant difference. Due to the effects of simple diction, easy structure, and shorter length, it was found that note-taking did not significantly exert its effect upon comprehension, implying that other factors including topics, delivery speed, and forms of the listening text should be considered (Hale & Courtney, 1994; Howe, 1974; Peters, 1972). Regarding the mini-talks, contradictory to Hale and Courtney (1994), note-taking was found to significantly assist the participants in listening comprehension without impairing effects. Significance also evidenced itself in the lectures, which corresponds to a number of the previous studies (Crawford, 1925; DiVesta & Grey, 1972; Fisher & Harris, 1973; Hartley, 1983; Howe, 1970; Teng, 1996; Weiland & Kingsbury, 1979).

An insight into the note content came in as a second analysis, drawing two major conclusions. One argued that the mean score of the note content in the three tests did not differ from each other significantly. The other stated that the longer length led to the richness of the note content, that is, the lectures resulted in the most

content note, followed by the mini-talks and conversations. With these two predicted findings though, the relationship between the note content and the participants' listening comprehension was investigated and further analyzed.

With regards to the questionnaire, it consisted of two sections – learners' perceptions of note-taking and their reflection on it. Under the section — the learners' perception, the following five issues were discussed:

- (1) Importance of note-taking strategy
- (2) Effect of note-taking on listening comprehension
- (3) Note-taking habit
- (4) Note contents and listening comprehension
- (5) Topic effects

The participants generally reached the consensus that note-taking played an important role in listening comprehension and consulting notes was considered an indispensable step. While taking a positive attitude toward the role of note-taking, they held an uncertain attitude toward their own self-efficacy in note-taking. Topic effects were widely recognized that the degree of familiarity with the topic corresponded to the quantity of their notes. In other words, listening to the more familiar topic, the participants would jot down more notes.

The other section explored the participants' reflection. The first question which dealt with the difficulty the participant encountered triggered the following responses listed in order of frequency from high to low:

- (1) Lack of concentration
- (2) Limited Vocabulary
- (3) Inability to identify the key points
- (4) Limited memory capacity
- (5) Speed

- (6) Unfamiliar with the topic
- (7) Missing other important information while taking notes
- (8) Deficient time to answer
- (9) Length of the text
- (10) Nervousness
- (11) Others

It was found that the participants had a wide assortment of strategies in note-taking. Through the frequency count, the strategy used most frequently was writing down abbreviations. As Yates (1979) found that the learners took notes in form of their personal ways, and created their personal symbols to transcribe the input. What took the second place was drawing pictures and symbols, preceding drawing graphs and charts, taking notes in a chronological order, and writing down key words. Only 1 out of the 32 students adopted the strategy of circling key words in the questions. The same was true of the strategy of reading the questions before listening, of writing down words with similar pronunciation of the key words, and of word-by-word transcription. Overall, symbols in place of words were widely used in note-taking.

For most participants, conversation was the least necessary section to take notes while they mostly agreed that mini-talks and lectures deserved the necessity of note-taking. In addition, the major challenges exposed to the participants were lack of concentration, limited vocabulary, and failure to identify main ideas, limited memory capacity, speed and topic saliency.

Through interviews with four participants in terms of their note scores and comprehension scores, the following conclusion was drawn. All the participants recognized that note-taking was facilitative in listening comprehension and good notes should be structured under an organized flow with key words. The two good

note-takers and the other two poor note-takers differed mainly in the number of their handy note-taking strategies. The good note-takers adopted a wide range of strategies and contrarily poor ones used three throughout the whole process. In addition, the poor note-takers showed a strong dislike for note-taking and unlike them, good note-takers had rooted the habit of note-taking deep in mind. Concerning these four students' performance on listening comprehension, the difference in comprehension failed to be explained solely on the basis of their note content but factors like language proficiency, attention spans, and topic effects.

The analysis of the data has pointed out that there was indeed a positive correlation between note-taking and listening comprehension. In interplay with text effects, the participants received more facilitating effects of note-taking in mini-talks and lectures rather than conversations. By taking topic saliency into consideration, it was evident that the major category of topics did not play a decisive role but the sub-topic which mainly served as the theme did, which contributed to the different results under the same category.

2.7 Summary of Chapter 2

The functions of note-taking have generally been considered to be encoding and external storage. To examine these two functions, some researchers claimed that the encoding function was facilitative in learning (Barnett, DiVesta & Rogozinski, 1981; Einstein, Morris & Smith, 1985; Peper & Mayer, 1978). Some researchers stated that the value of note-taking factually consisted in external storage rather than recording notes (Annis & Davis, 1975; Fisher & Harris, 1973; Howe, 1970; Kiewra, 1985). Unlike the previous two statements, other researchers concluded that the note-taking behavior might exert interfering effects (Aiken, Thomas & Shennum, 1975; Kiewra, 1985; Fisher & Harris, 1974; Peters, 1972).

The effects of note-taking upon test performance have been widely discussed (Dunkel, 1985; Dunkel, Mishra, & Berliner, 1989; Hartley & Davis, 1978; Palkovitz and Lore, 1980). Generally speaking, learners' note-taking has been found to have a positive relation with their test performance (Lin, 2005) and the best predictor of test performance is considered to be the criteria of answerability (Dunkel, 1985).

Lectures have long been regarded as a different text from conversations and literary language (Benson, 1989; Tannen, 1982). In terms of its formality, it is in the middle of the continuum. Its language consists of formulaic expressions and semi-formal organization. Furthermore, the lecture can be classified into three styles – conversational, rhetorical, and reading (Benson, 1989). Concerning the difficulties encountered by learners in comprehending lectures, the biggest obstacles are delivery speed and vocabulary (Flowerdew & Miller, 1992; Lin, 2005). Another factor that affects lecture comprehension is prior knowledge which has been widely investigated (Chiang and Dunkel, 1992; Dunkel, 1988; Marham & Lathan, 1987; Schmidt-Rinehart, 1994; Weissenreider, 1987).

To examine the note content, Dunkel (1988) has developed five criteria –(a) the total number of words, (b) the number of information units, (c) test-answerability, (d) completeness, and (e) efficiency. It was found that the test-answerability served as the best predictor of test performance.

The question type generally follows Van Dijk & Kintsch's (1983) definition of categorizing global and local questions. Researchers have different findings upon the effect of the question type. Shohamy & Inbar (1991) found that local questions pose less difficulty than global questions for the subjects. However, Chen (2003) claimed that the subjects did better on global than local questions when writing was involved in the listening comprehension task.