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An Investigation of Metacognitive, Bottom-up and Top-down Strategies in L2 Listening

Xibo Henderson
California State University, Monterey Bay

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An Investigation of Metacognitive, Bottom-up and Top-down Strategies in L2 Listening

Xibo Henderson

Thesis Submitted in Partial Fulfillment of the Requirements for the
Degree of Master of Arts in Education

California State University, Monterey Bay

May 2017

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AN INVESTIGATION OF STRATEGIES FOR L2 LISTENING

An Investigation of Metacognitive, Bottom-up and Top-down Strategies in L2 Listening

Xibo Henderson

APPROVED BY THE GRADUATE ADVISORY COMMITTEE

Kerrie Chitwood, Ph.D.
Advisor and Program Coordinator, Master of Arts in Education

Casey McPherson, Ph.D.
Advisor, Master of Arts in Education

Erin Ramirez, Ph.D.
Advisor, Master of Arts in Education

Kris Roney, Ph.D. Associate Vice President
Academic Programs and Dean of Undergraduate & Graduate Studies

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Abstract

Listening comprehension is the centerpiece of learning a language and it is also the most difficult modality for student success. This study investigated two processes: top-down and bottom-up processing in second language learning, as well as how metacognitive strategy regulates the learning process. Four participants were selected with varying degrees of second language listening ability; two good listeners and two weak listeners. Qualitative research methods including three data sources: interviews, students' listening notes and teacher observations were triangulated to explore how learners progressed with language listening strategy instruction. Based on the findings, all participants have gained from the listening strategies instructions. Although the weak listeners in this study showed no improvement in their scores, they all, especially these weak listeners, gained the strategy of listening, as evidenced by the increasing awareness of their own listening process, forming a better listening habit and gaining confidence in listening. The results also showed that learners at different learning stages use top-down and bottom-up processing differently.

Keywords: top-down processing, bottom-up processing, metacognitive strategy, listening strategy

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Literature Review

When learning a foreign language, people often encounter many learning obstacles, the most intimidating being the need for immediate comprehension of the new language while listening (Andringa, Olsthoorn, Beuningen, Schoonen, & Hulstijn, 2012). Listening is a skill that requires a desire to understand another human being, an attitude of respect and acceptance, and a willingness to open one's mind to see things from another's point of view (Rost, 2011). Thus, listening requires a high level of concentration and demands that the listener not have a predetermined agenda and can take on the perspective of the speaker. Listening is often said to comprise nearly half (i.e., 40-50%) of the time spent on communicating, with speaking, reading, and writing combining to make up the balance (Mendelsohn, 1994). Therefore, listening is an essential skill that people must master when they are learning a second language.

Definition of Listening Comprehension and the Process of Listening

As defined by Vandergrift (1999) listening comprehension is when a listener is required to spontaneously: discriminate among sounds, understand vocabulary, notice grammar and intonation, and interpret meaning. The process of listening occurs in five stages: hearing, understanding, remembering, evaluating, and responding (Rost, 1990). In stage one, the listener is receiving input, hearing the sounds, and distinguishing among them. During the second stage, the listener understands the sound. In second language acquisition, the listener also decodes the words and grammar, while learning from the process. In the third stage, the listener is remembering what has been heard while maintaining working memory for comprehensive checking. During the fourth stage, the listener judges the information and finally in the fifth stage, they make appropriate

responses to open-ended questions. In order to aid students who are learning a second language, listening strategies that encompass the five stages must be explicitly integrated into the curriculum.

Listening Strategies

Although second language (L2) study has been populated with many underlying theories, the principal objective of this study is to examine the relative effectiveness of two forms of L2 processing; bottom-up and top-down, as well as metacognition strategy. Bottom-up and top-down listening processes are two distinct psycholinguistic approaches to understanding others' speech, and it is virtually impossible to do one without doing the other (Oh & Lee, 2014). Given the operational imperative that bottom-up and top-down processing operate nearly together, this study intends to seek greater understanding of how strength of the language, sentence formation, and metacognition influence a person's utilization of each the processes alone and both processes together (i.e., bottom-up or top-down versus bottom-up and top-down).

Top-down and bottom-up strategies. Both the bottom-up and top-down strategies arose out of 1970s computer science by IBM researchers Mills and Wirth (Nunan, 2010). The bottom-up strategy is text based, relying upon language aspects (i.e., sounds, vocabulary, grammar), and is a process of decoding the sounds, from the smallest units to complete texts (i.e., listening for specific details, recognizing cognates, and recognizing word order patterns) (Nunan, 2010). Alternatively, the learner-based top-down strategy focuses upon the listener's thinking process, constructing the original meaning of the speaker by using incoming sounds, and using context as clues to interpret the main idea, make predictions, and summarize intentions (Nunan, 2010). Top-down and bottom-up strategies are referred to collectively as *Interactive Strategies* that focus on both the language and the listener.

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Research surrounding bottom-up and top-down processing has been focused mainly on the use of either strategy as researchers still debate which process contributes most to listening comprehension (Field, 2004; Tsui & Fullilove, 1998). Some researchers focused on top-down processing (i.e., Hildyard & Olson, 1982; O'Malley & Chamot, 1990). For example, Hildyard and Olson's (1982) study found that good listeners listened using top-down processing while poor listeners mostly listened using bottom-up. The same held true in the case of learners, the more effective ones using more top-down strategy understanding a message, while less effective learners tending to use more bottom-up strategy (O'Malley & Chamot, 1990). Whereas other researchers (i.e., Eskey, 1988; Perfetti, 1985) believed that good bottom-up skills are required for effective L2 processing, and that poor readers may be poor readers because of their weak word recognition (bottom-up) skills.

In the early 1980s, only top-down processing was believed to improve L2 listening comprehension (Hildyard & Olson, 1982). More recently, both top-down and bottom-up listening strategies have been accepted as being able to greatly enhance listening comprehension (Nunan, 2010). Likewise, Vandergrift (2004) stated that learners need to learn how to use both processes to succeed. Students must hear some sounds (bottom-up), and hold them in their working memory long enough (i.e., a few seconds) to connect them to each other and then interpret what they heard before new information is introduced (Nunan, 2010). At the same time, listeners also need to use their background knowledge (top-down) to determine meaning with respect to prior knowledge and schemata (Brown, 2006). Both types of strategies are necessary in developing courses, materials, and lessons to help students not only discriminate among different sounds, but also to use what they already know to understand what they are hearing. Thus, numerous studies have

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been conducted on L2 listening skills in relation to the use of both processes (i.e., bottom-up and top-down).

Li and Renandya (2012) studied the efforts of Chinese teachers of English as a Foreign Language (EFL) to help solve their students' listening problems. The results showed that participants preferred the bottom-up approach for recognizing and coping with quickly spoken words in conversation. Additionally, Field (2008) noted that in intermediate level L2 listeners, the content (bottom-up) words were the most readily recognized during the listening process. In another study, Abdalhamid (2012), considered the listening skills of a group of native Arabic speakers living in the US. The study showed that these experienced listeners used more top-down skills than their lesser skilled peers. On the other hand, Yahya (2007) investigating the listening obstacles faced by EFL learners at university in Iraq, reported that the participants' English cultural paucity left them unable to use prior information and background knowledge to guess at new words and expressions, weakening the effectiveness of a top-down listening strategy. Given the lack of consistency in results, more studies must be conducted to determine how best to meet the needs of L2 listeners. Moreover, a widening range of applications for metacognitive language learning strategies is being posited for the investigations into L2 listening comprehension (Goh, 2000, 2002; Vandergrift, 1997; Vandergrift & Goh, 2012).

Metacognitive language learning strategy. Flavell (1976) first coined the term metacognition as awareness of one's own cognitive processes. Put simply, metacognition is contemplating one's own thinking. In relation to listening, as students become more aware of their own listening process, they can evaluate their own listening skills and utilize strategies to become more effective listeners (Vandergrift, 1997). Flavell (1976) further described its composition in the form of three different kinds of metacognitive knowledge: personal factors (i.e., individual

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characteristics), task factors (i.e., means and objectives), and strategic factors (i.e., task facilitation tactics). Metacognition has two key aspects: 1) personal management of cognitive functions, and 2) attitudes and certainties regarding cognitive processes (Flavell, 1976). Since metacognition is thinking about one's own thinking, utilizing metacognition must be taught to students using strategy instruction. Modern metacognitive strategy instruction is generally comprised of four phases: planning, monitoring, problem solving, and evaluating. Planning is the preparation stage, when the instructor can lead students to activate their prior knowledge, and discuss with them about what type of listening strategies and tasks they will undertake, and what resources they will need (Cross & Paris, 1988). Monitoring and problem solving (regulating) happens throughout the learning process. As Flavell (1976) discussed the subject, cognitive monitoring is in the context of cognitive experience. As expressed in the terms of listening comprehension, it is what students know and how much they know, what their problems are, and what strategies they have to resolve the issues (Paris & Winograd, 1990). Evaluation is the stage that assesses the processes and products of one's learning, and revisits and revises learning goals (Cross & Paris, 1988). Within this process, strategies are customized to meet students' individual needs (Chamot, 2004).

As metacognitive strategy instruction must occur for students, many researchers have focused on implementing these strategies in foreign language classes. Various studies have shown that when listening lessons are blended with metacognitive strategy instruction, students of all ages gain confidence, motivation, and growth in relation to listening (Vandergrift & Tafaghodtari, 2010; Cross, 2009b; Goh & Taib, 2006). Further, Harris (2004) found that the more skilled listeners use more metacognitive strategies than lesser skilled listeners. The findings from these studies emphasize the need for students to use metacognitive strategies when learning a second language. Additionally, it is important that students learn how to select the learning strategies that

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will help them to be effective learners (Chamot, 2004). Listening strategy instruction blends into language learning, to enrich awareness of metacognition, and to promote better language acquisition through listening (O'Malley & Chamot, 1990; Oxford, 1990).

Summary

Many studies have centered around the use of bottom-up versus top-down process when examining L2 learners listening skills (i.e., Eskey, 1988; Hildyard & Olson, 1982; O'Malley & Chamot, 1990; Perfetti, 1985); however, few studies have focused on the use of both processes. Further, as researchers have found mixed results in relation to which process leads to higher achievement in listening, it is important to focus on interventions that incorporate both processes. Additionally, research has shown that metacognitive strategies, when used in conjunction with both bottom-up and top-down strategies have the greatest influence on students' confidence, motivation, and growth in relation to listening (Vandergrift & Tafaghodtari, 2010; Cross, 2009b; Goh & Taib, 2006). Therefore, the present study explores the relative contributions of the variables that govern the world of top-down, bottom-up and metacognitive L2 listening strategies, utilizing qualitative research.

Research Question

How do the top-down and the bottom-up strategy-based approaches influence students' listening skills in a classroom for Chinese language instruction?

Methods

Research Design

Although relatively under-researched compared to other language skills (Oxford, 2011; Vandergrift, 2007), listening is currently attracting the attention of researchers and instructors in the pursuit of the effective teaching of listening. Further, Vandergrift (2007) noted that while

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quantitative approaches were useful in determining approximate degrees of listening success, they explained little about how listeners reach right answers or why comprehension breaks down. He suggested that a solution for these shortcomings could lie in listening process studies that employed qualitative methods to reach better understandings of both L2 listening processes and listeners' comprehension. This research, through every phase of data collection, analysis, and interpretation, performed content analysis and analytic inductions based upon various qualitative research methods (Maxwell, 2013; Merriam, 2009; Strauss & Corbin, 1990). Thus, theoretical assumptions and practices were evaluated using multiple data sources: students' notes, interviews with students, and teaching field notes.

Setting

This study took place at an education and research institution which provides linguistic and cultural instruction to members of the military that is conducted at highly accelerated paces. The teaching staff are highly educated linguists, nearly all of whom are native speakers of the target language. The demographics of this institution are not made available to the public.

The sole mission of this institution is to qualify its students to fulfill their duty assignments as linguists, thus the school's entire system is conducted to produce students' rapid absorption of their target language. The program is comprised of intensive training in a target language, undiluted by any studies in unrelated subjects. Courses last between 26 and 64 weeks, depending on the difficulty of the target language. Students spend seven hours per day in class and do two to three hours of homework every night, as well as additional independent language and culture studies. This institute's teaching philosophy is implemented via a total immersion policy, meaning that usage of the target language is dominant in its classrooms.

Participants

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For this study, four out of fourteen students were selected as research subjects. Two students were good listeners and two other students were weak listeners. These participants were part of a convenience sample, as all participants were students in a class taught by the researcher and her colleague. Of the fourteen, five students were from the Navy, three were from the Army, and six were from the Air Force. Eleven were male and three were female. Their average age was 21, the range being 28 through 18. Two of the fourteen students had college degrees, five had solely earned a high school diploma, and the remaining students had some college experience without a degree. The majority of students had learned some languages in the past and none had any background related to the Chinese language as identified in the student survey (see Appendix A).

Participant 1. John had a fairly good vocabulary but his perfectionistic ways would occasionally render him unable to continue when he could not catch full details. He is emotional and from time to time his personal issues hindered his concentration on language study. He was unaware of his learning strategy and not absolutely sure what he could do to get better. Frustration bothered him from time to time when he was trying to figure out his listening and the slow process of listening demotivated him.

Participant 2. Mary had a very good vocabulary and, for her young age, was highly motivated to study language. She likes to explore what is out there. In the beginning, she had a difficult time distinguishing the sound of Chinese but then, she tried figuring out ways to resolve the issue. Her reading was better than her listening and she was outspoken and liked to practice her Chinese speaking in and out of the classroom. She even started reading Chinese novels.

Participant 3. Mark had a good vocabulary. He started his listening from the translation mode and quickly enough realized that it was not the way to catch all of the information. He

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actually started to seek the strategies himself, meanwhile warning his fellow classmates not to overuse the grammar translation method (Richards & Rodgers, 2001). He had slower aural processing than visual perception thus, he could not match the Chinese written form with its pronunciation quickly enough to avoid having a hard time when he practiced reading aloud in Chinese.

Participant 4. David had a good vocabulary, although he was a little slow in the beginning of his Chinese studies. His instructors thought his slower response to teachers' questions was noticeable. He was a quiet person who preferred his own pace, principally using bottom-up strategy. His word processing though was not slow, which helped him in listening. He was keen on the analysis of Chinese grammar and word usages and gave a lot of effort to reviewing previous lessons.

Sources of Data Collection

The study collected data from three different sources: students' notes, interviews with students, and teaching field notes. Given that the main focus of this study was to understand the impact of listening strategy (i.e., top-down, bottom-up, & metacognitive) instruction on students' listening comprehension, students' notes taken during listening comprehension activities were archived for inclusion in the analysis.

Student's notes. Participants were given cognition questions about their listening process, to help each of them consciously form their own listening habit, observe their own listening process and adjust their own listening strategies before, during and after listening practice (Appendix B).

Interviews. Another source for qualitative data were semi-structured, one-on-one interviews with students' regarding their understanding and practice of listening strategies. The

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interview questions were developed on the basis of current metacognitive listening strategies (Vandergrift, Goh, Mareschal, & Tafaghodtari, 2006) such as planning-evaluation of listening process, solving listening problems, and explaining personal knowledge (Appendix C). The purpose of one-on-one interviews was to record in-depth individual opinions on listening strategies. The guided conversations used open-ended questions and all of the questions and responses were tape-recorded.

Teacher field notes. The third source of data was from the researcher's field notes, comprised of observations of the students during the class. The researcher compared her observation with other data sources. From this perspective, the researcher could see how top-down strategy generally affected student listening processes and how bottom-up strategy complemented top-down strategy.

Procedures

Data were collected over the course of three weeks. The week before collecting the data, the researcher used one hour to explain the purpose of the study to the whole class: to help students form good listening habits by using metacognitive strategies to cultivate their top-down and bottom-up listening strategies. Within that hour, the researcher also taught the students how to integrate the intervention into their L2 listening process (pre-listening, during listening and after listening). During the next two weeks, the researcher conducted the intervention during scheduled 50-minute listening sessions, providing guidance to students as needed (i.e., reminding students to anticipate the answers or directing their attention to the verbs in the sentences). Intervention was served to the whole class of 14 students. However, four target students' listening notes were then selected to analyze. Each session produced one data set, 3 times a week per student, 6 times per person in total, which resulted in 24 pieces of student listening notes. Students produced their

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written listening notes, during and just after listening. The researcher collected the written responses from all students at the end of each session.

During the two-week intervention, the researcher took detailed notes on the targeted interview students. During that period, the researcher started coding the notes on both student listening notes and the researcher's own observation notes. In the fourth week, the researcher conducted separate, semi-structured interviews (Appendix C) with each of the four targeted students, using interview questions developed by the researcher, based on *The Metacognitive Awareness Listening Questionnaire* (Vandergrift et al., 2006). Then, after transcribing the interviews, the researcher coded the interview transcripts.

Materials. Various materials were used during the intervention phase of the study. The books that were used included textbooks provided by this institute's curriculum departments, such as textbooks, listening books, and speaking books, with listening books and textbooks being the primary materials used. Additionally, supplementary materials produced by this institute's Asian School I instructors were used.

Intervention. The purpose of the intervention was to help students form good listening habits by using metacognitive strategies to cultivate their top-down and bottom-up listening strategies (Vandergrift, 2003). Multiple previous studies have shown that even short periods of listening strategy intervention, comprised of as little as five to six average metacognitive listening strategy instruction periods still showed positive results for weak listeners (Cross, 2009b; Goh & Taib, 2006; Vandergrift & Tafaghodtari, 2010). This intervention included six 50-minute listening sessions, three times each week. The intervention consisted of students participating in listening practice with the researcher on course related materials. This exercise was to help them form good listening habits and become conscious of the process of their listening. Students' participation in

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listening activities was voluntary. The six sessions consisted of similar activities focused on students listening to several Chinese audio passages for listening practice. All of the passages came from this institute's textbooks or supplementary listening materials, chosen to match with level-suitable core materials. Each audio passage was approximately one to two minutes in length, featuring vocabulary that was mostly familiar to the students, was in monologue or dialogue formats and presented at normal or slightly slower than authentic speed. While listening to the passages question sets were provided to students with basic clues to the listening materials. Alternatively, one session was conducted with summarization questions in order to train students to use their summarization skills.

Each listening session consisted of three rounds. For the first round of listening, learners used their pencils to write down the answers to the questions and then highlighted the answers with yellow highlighter. The researcher advised the students that when they were writing down their answers, they should feel free to use as much guesswork as they needed to derive a conclusion. During the first round, the researcher would walk around to see the students' yellow highlighted answers while taking mental notes about what students missed and what they understood. When the audio file played the second time, the students wrote down their answers with their pencils, with guesswork still welcome, and then highlighted in orange color. Then the researcher and students talked about the answers and students used a red ink pen to mark their answers, while talking about what were right answers and what were not. During this time, the researcher still did not reveal correct answers. Then the researcher played the audio for the third time, this time allowing students to use red pens to make corrections and yellow for highlighting. After talking about the corrections, students began to analyze why they made such mistakes, how they could

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reach right answers, what obstacles remained for their practice and what they could do to improve. This process continued three times a week for two weeks in total, each session lasting 50 minutes.

Ethical Considerations and Validity Threats

To protect participants' confidentiality, all names were coded. During data collection, no video tapes were utilized, but audio recordings were made to ensure students' privacy and also to achieve accurate data. Finally, a single coded file was created to serve as a safe repository and saved on only the researcher's computer. In records of interviews with students, little biographic data was associated with any individual (Appendix A). The researcher cleaned students' notes regarding their listening process, to ensure that any specific information related to participants and the setting was coded and unidentifiable.

Validity. Qualitative research methodology was used, which by its descriptive nature entailed utilization of sole judgement regarding data inclusion and exclusion. A critical researcher has to rely not only on what people actually describe to be their beliefs, attitudes, cognitions, intentions and evaluations, but also upon the researcher's own ability to *read* the participants' meanings, by observing what they say, their body language and past actions, while considering accounts from other sources in the same situation (Martella, Nelson, Morgan, & Marchand-Martella, 2013).

Because of the setting and participants' uniqueness, as well as the intensity and the fast-paced instructional schedule of the institute, these current research results may not be comparable with those of typical four-year college settings. Nonetheless, the results should compare for any other intense language-learning program or individual seeking to learn a language in a short period of time. To insure the integrity of the research, the researcher collected complete, consistent data, utilized full collaboration with participants, employed multiple methods of data gathering, gave

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adequate interpretation and finally, used triangulation methods in the collection of data, in order to increase the strength of conclusions reached (Kaplan & Maxwell, 2005).

Data Analysis

In the early stage of this project, an open coding system was selected, which could collect and analyze various aspects of the data, exhaust the categories of data at hand, and identify segments of data that are responsive to the research question (Merriam, 2009). The researcher focused upon the number of times certain words, phrases or speech patterns were used, in order to capture the raw data relevant to the research question, expecting that insights could be discovered from all the documents. Student and researcher field notes, were coded with marginal notes and comments made as the data was collected. The construction of categories was highly inductive, from the beginning of tentative categorization to the evolution of final categories. The process involved coding the raw data and constructing the categories that were relevant to content, to attain the most rigorous process.

The researcher, along with a colleague, coded the data. The first step of coding began with an open coding system that utilized all potential open thematic coding, as well as an interpretive process by which the data were analytically broken down (Strauss & Corbin, 1990). In the second step, the researcher compared each set of data along the way. All qualitative data analysis was primarily inductive and comparative. The researcher drew heavily from the constant comparative method of data analysis first proposed by Glaser and Strauss (1967) to check all the similarities and differences, construct all the categories, sort the data, reduce the number of categories, and find a theoretical way to answer the research question.

The second data set was the researcher's field notes, which were synchronously written with students' field notes – the first data set. The third data set was comprised of the structured

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student interviews, which were conducted by the researcher with a set of interview questions (Appendix C) that had been developed from metacognitive researches of language listening strategies. The researcher conducted all interviews and transcribed and stored them in a computer for backup. This analytic approach allowed the researcher to analyze the content of the data and identify categories. The researcher then utilized the students' reflections, ideas and comments on the data, including comparisons from one data set to the next, then synthesizing from one data set to the next, to form tentative categories and themes. All data were then triangulated to ensure that the thematic codes were representative of all three data sources.

Results

Results from this study were based on triangulation of the three data sources: student interviews, student notes and researcher field observation notes. From these three data sources, the researcher used an open coding system and three primary themes emerged. These themes are: the beginning learners use more bottom-up strategy, metacognitive listening strategies in different learning stages improve listening comprehension outcomes, and students' personal characteristics play an important role in listening comprehension.

Beginning Learners Use More Bottom-up Strategy

All three data sources (students' notes, the researcher's notes and interviews) indicated that the four participants demonstrated progression through the five stages of the listening process: hearing, understanding, remembering, evaluating, and responding. Although not all of them went through the stages to the same degree, all four students used either top-down or bottom-up strategies to some level in their listening. Since the participants are in their sixth-month of learning the Chinese language, and were still in the stage of accumulating linguistic elements such as words, sounds, and grammar, most of them were more inclined to use bottom-up processing. This

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was observed from students' listening notes: that they took more notes on words they heard. Moreover, with the interventions, all participants became aware that they were using more bottom-up processing, without awareness of using top-down processing. According to the sequential nature of the textbooks used at this institution, with a topic theme on each unit, structured-learning management has actually created a top-down and bottom-up learning process environment for the students.

Connecting the sounds of the words with their meaning. There are five listening stages and all four participants reported to engage in each. For example, they listened to audio passages, decoded the words and grammar, and held the information in their working memory to form answers for specific sets of questions. Researcher field notes indicated that David, the fastest student, caught the most details in the first listening round, connecting the hearing and understanding stages almost simultaneously. David was able to synchronize the Chinese sound and English meaning as he listened.

During the listening practices, David and Mary displayed an understanding of the bottom-up and top-down processing fairly easily. For example, they used context to solve unknown words after they had caught most of the details. Furthermore, David and Mary both reacted to the audio inputs (sounds, vocab, grammar) much more quickly than Mark and John did. These skills were easily evident from the students' listening notes during the first round of listening. Specifically, it was evident how much more David and Mary could produce as compared with Mark and John, as well as the accuracy that David and Mary displayed.

During the student interviews, David discussed how he makes meaning of auditory information. Specifically, he noted, "You have to internalize the meaning of the words. That is why I can quickly catch the meaning of the sound." Furthermore, David described how he would

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listen to the sentence-level listening materials, which help students sustain vocabulary and grammar when he studied vocabulary. In addition, he would review vocabulary through Pleco (a language learning application) and listen to sound files to internalize the meaning of the words.

In her interview, Mary also stated that she used Pleco and sentence level listening materials to sharpen her word recognition speed. In contrast, during John's interview, when asked, "How do you study your vocabulary?" He responded: "First, I look at the Chinese characters and write them until I can recognize them. Then I look at Pinyin (Chinese pronunciation) and the last is the English meaning." John, a weaker listener, used a different process to develop his listening skills. Furthermore, John indicated that he did not listen to vocabulary, because he felt more comfortable learning Chinese words using visuals and had not thought about challenging himself with aural inputs to solve his listening issues. Another student, Mark, was also having problems with quickly recognizing meaning from the sound of the words. In his listening notes, the researcher observed him writing down the Pinyin of the words with questions marks beside them, which indicated he could not quickly respond to what he heard.

Top-down & bottom-up strategies for beginning language learners. The four participants attended to sounds and their meanings in different ways. For example, researcher field notes revealed that David was adept at comprehending content words that were presented orally, but of the four participants, John was usually the last one to catch the entire sentence as demonstrated by his receiving the lowest score on his Unit 4 Unit Listening Test. During the six listening intervention classes, more than half of the time John only recognized the beginning of the sentences or passages, due to his slow processing speed on recognition of words. During the interview, the researcher asked John what was going on in his mind when listening to a passage, he said:

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The whole thing? It depends on the length. If it is shorter, I can get it, or I can repeat it in my head and then get the answers. I was spending still more time catching every single sound, repeating them in my head and then arranging them too.

When John was doing these mental activities, he was not able to attend to additional audio input. His slow word processing speed and his determination to grasp every single sound did not leave much room for top-down processing to work for him. These two *interactive* processes are supposed to intermingle. The more time John spent on pure bottom up processing without shifting his attention around, the more audio input he lost.

John was trained to listen and comprehend an entire sentence in one listening, tolerating some missing parts and concentrating on grasping the content words instead of the function words (e.g., grammar). In addition, the researcher specifically trained John to use his top-down processing skills to figure out the unknown and uncertain auditory information, and to make logical guesses based upon things he already knew. John displayed variable listening habits; however, his ability to make logical guesses showed promise. Gaining good listening habits will likely take more direct and specific training time for John.

Mark was able to use his background knowledge to make educated guesses since he did not have fast word processing skills. He needed top-down processing to do what bottom-up processing could not do for him. Researcher's notes stated: When Mark guessed correctly he could actually comprehend a passage, since the testing format in this institute was on paper, using English to ask and answer questions. However, when he could not grasp right key words or he missed the essential parts, then he lost points heavily. That is why his grades were not steady, fluctuating widely instead. He usually lost more points on verbatim translation because of his weak bottom-up foundation.

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During the interview, when asked, “Have you consciously used top-down processing during the listening?” Mark responded:

No, I have not done that, but I think that sometimes my brain has done that. I try to do the big idea, like in a big passage to pick out what the main idea is and go from there.

Mark used top-down processing naturally, to gain the strength to continue and not be discouraged. Nevertheless, he was inconsistent with his bottom-up processing, and his overall processing speed.

Metacognitive Strategies to Improve Listening Comprehension

Planning. David and Mary showed signs of awareness of their own listening or metacognitive awareness. The researcher observed that they could evaluate their own listening both during and after the listening process. David knew that his listening habit of recognizing all the details in the first round of listening fully utilized his fast word processing skill to press his advantage to the limit. He said:

You may notice the first thing I write down is the details I have gotten, because details are the hardest to get. My first listening is all gathering details. Later I can get the main idea, or figure it out from the details but if at first all I get is the main idea, I will never be able to guess the details from that.

What David described was that he used bottom-up strategy when he listened. Listening to details is one of the features of bottom-up processing. However, from his field notes and interview, the researcher could see that David was not only using the bottom-up strategy, but was also thinking about his listening process. During the interview, when asked, “Do you do any warm-up activities before listening?” He responded, “I like doing vocabulary review before I listen to the Chinese passages or listening to some Chinese, before school even gets started.” The other fast listener Mary stated, “I like to write after I have learned GLOSS or other new Chinese learning

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material, to improve my retention.” This shows that Mary was able to think about the ways she implements strategies to increase her learning.

John and Mark used fewer metacognitive processes. During their interviews, they stated they had not created learning plans. However, after the intervention, John indicated how helpful he found the strategy and purchased some markers to conduct similar practices alone at his home. Both of the weak listeners, especially John, gained some insight into their own listening. John also gained some top-down process strategy, using it on his own to practice and gain confidence. Nonetheless, he still has a long way to go to gain an automatic listening habit.

Problem solving. Problem solving is an important metacognitive learning strategy; however, of the four participants, David was the only one who overtly spoke about problem solving. Interviews demonstrated that good listeners identified issues that occurred during listening and take the initiative to find solutions. For example, David struggled when he started in this program and most of his instructors thought he learned at a slower pace. It did not take him long to figure out a way to resolve his issues. When he had difficulty with timed reading and listening, he began to pay more attention to his learning, “You really have to internalize the meaning of every word that you hear – paying attention to every detail is understanding every detail, and you just get better and better.” When asked, “During listening, when you run into unknown words, what do you do?” He replied, “I am not hanging on to them. I would write down a likely spelling of what I heard, so I could remember to find out later what it meant.” This demonstrates that David was able to resolve his issue by not holding on to unknown words.

David demonstrates the problem solving skills of a strong listener. In contrast, the researcher observed that other students did not take the same approach. For example, another student John encountered unknowns, he would dwell on the unknown words or grammatical

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structures, rearranging them in his head until he missed an entire passage or lost additional degrees of comprehension. Then, he would become overtly frustrated and condemn himself for what happened. Once this happened, John was not able to recover and listen to the auditory information being presented.

Evaluating and monitoring. The researcher's field notes, and interviews with David and Mary, revealed both were constantly evaluating and monitoring their own learning. Mary was the most autonomous of the four participants, constantly taking the initiative to expand her learning horizon. From her listening notes, she would evaluate her own listening progress, monitor the errors she made, and then find the solution to resolve them. Both of the faster listeners were always thinking when studying Chinese. For example, David would figure out what details were most important to him. Even though some of his instructors would ask him to first identify the main idea, he continued to gravitate towards identifying the details in the first round of listening. After evaluating his situation, he decided that knowing the main idea would not tell him anything about the details, so he just wrote down as much detail as he could and then figured out the main idea from there.

John, a less advanced L2 listener, was the opposite of David. During the interview, when asked, "Have you been monitoring your own listening?" He responded, "Sorta." In reviewing the researcher's observation notes and John's notes it became evident that he solely relied on his emotions when monitoring his listening. For example, when he was able to identify the majority of the details in a passage he was a happy man and he drew a happy face on the practice sheets and wrote comments such as "Do it again! I mean do it better." On his listening practice sheets, he sometimes wrote his comments "quit second guessing or don't be afraid to use the 'obvious' answer." John was beginning to move from being a sporadic listener, to a consistent observer of

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his own listening. However, he still mostly identified his listening ability by his emotional swings instead of by pure analytical observations. During the practice, the researcher encouraged John to trust his instincts and not solely rely on his emotions when monitoring his listening.

Since John was struggling to identify the incoming sounds, he felt frustrated and defeated, as evidenced by researcher observations. John displayed outward signs of frustration and was visibly mad at himself. He then focused on being mad and lost track of the listening passage. Similarly, Mark was able to evaluate the weak area of his Chinese listening ability, but during the interview when asked, “Have you done anything to resolve the issues?” he replied that he had not. He thought that his listening issues would naturally decrease through the regular learning process.

Students’ Characteristics

Several subthemes were identified throughout the text related to listening comprehension and student characteristics.

Student confidence level, emotions and learning behavior. The first subtheme identified was students’ confidence level, their emotions and learning behaviors. David and Mary had overcome their nervousness about learning a second language by building their confidence level. Mary was initially nervous about the difficulties associated with learning a new language. However, she shared her story of when she overcame this fear. Mary was sick for a couple days before the Unit 3 tests, which were the high-stakes test for that time. With little time to review, she nonetheless earned a listening score of 97 out of 100. During the interview, Mary indicated that she knew from that moment that she would be fine in her day-to-day studies. The other strong listener, David, discovered he understood things that the other students could not. During the interview, David indicated this was a turning point because he realized his abilities and became more confident.

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Student emotions and behavior play a big role in language listening. David and Mary had more positive emotional reactions leading to better retention, reaction, comprehension, and confidence. However, Mark and John let their emotions influence their listening leading to shaky retention, slow reaction, lower comprehension, and lack of confidence. From the researcher's observation notes, "When John lost track of a passage while listening, he would become so angry with himself and with his surroundings that he became stuck in that hard place and had to start over, sometimes repeatedly."

Learning behaviors also influence students' listening abilities. During the intervention, when encountering a difficult part of the listening passage Mary and David tried to figure out the meaning by using context clues, prior knowledge, or even guessing. Both participants also liked to explore all of the possibilities of the language, by asking additional questions to the teacher or using language-learning tools to deepen their learning.

Concentration. During listening, concentration is essential to comprehension, even in one's native spoken language. David and Mary claimed that they had to concentrate so much that sometimes they experienced headaches. In the interview, David said:

I think you cannot be lazy when you are listening . . . and you have got to catch on to every little detail and you've got to consciously think about it because, I think a lot of the times the points that I lose are just because I am lazy while I'm listening . . . and I know when it is working because I will get a bit of a headache.

David self-reported he had high-levels of concentration while identifying details in a listening passage. He also claimed he would give 110% of his attention when trying to understand the concept. As such, he could simultaneously shift his attention when he ran into unknown words. Similarly, Mary expressed her feelings in her interview by stating:

When I focus on everything, my brain feel so exhausted. Sometimes, during listening, I will tune out a little and shift into a strategy specific mode that is helpful when I expect I will have to answer open-end or multiple-choice questions about the passage.

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Therefore, similar to David, Mary stated she concentrated so hard that she often feels exhausted.

John concentrated on function words during the listening, instead of content words.

Function words do not tell meaning and therefore he would lose his concentration on the meaning of the passage. During the intervention, when the researcher told him to focus specifically on certain words, he followed and actually could figure out meaning in one round, with only one or two small things missing. This was much better than missing the whole thing or only getting the beginning of the passage.

Working memory. Working memory is an important component to listening, especially long and complex passages. When the listening materials were long, and syntax was complex, neither John nor Mark could remember the meaning of the passages. They were more concerned with the sentence structures and unknown parts causing, them to not remember the overall meaning of the passage. They would claim that they did not remember anything or that they could not remember the whole thing. What they described could be referred to as working memory as well as the ability to hold on to the details. When the researcher talked to Mark about his working memory, Mark stated:

If there were sets of questions or multiple-choice questions, then I could get the correct answers more easily than doing translation. It seemed hard for me to hold small language elements together. I could pick up key words most of time but that was all.

Mark instinctively attended to content words for the sake of meaning; therefore, he lost most of the function words. The researcher discussed bottom-up strategies to improve his working memory, because he already relied heavily on top-down processing strategies for his listening. The two fast listeners, David and Mary, used their working memory to internalize the words they learned. Therefore, they had an easier time listening to sentences and translating into Chinese than John and Mark.

Discussion

The purpose of this study was to focus on understanding the listening processes, and help students to form good listening habits. These processes included: utilizing top-down and bottom-up processing and using metacognitive strategy to regulate their listening comprehension progress. This research was situated in the L2 listening literature (Nunan, 2010; Vandergrift, 2004). In language acquisition, language decoding through listening has to start in a bottom-up process, parsing the phonemic and syntactic features of input (Carrell, 1988; Carrell & Eisterhold, 1983; Rost, 1990). When one parses a sentence, he/she breaks it into parts and analyzes each element carefully. Students who are not gifted language learners need to use both forms of processing to achieve ideal listening comprehension.

Learning language is a holistic experience. If a student does not use contextual knowledge, then even the simplest language inputs can lead a listener astray. Even for beginners, the more background knowledge students have about the target language will increase their confidence. Further, beginners can also use prior linguistic knowledge to understand new listening passages with previously learned words. Learning new languages also depends on each individual's needs. In this study, the researcher focused on four participants each with their own unique needs in relation to listening comprehension. For example, David had adequate bottom-up processing skills and hoped to improve them. As his instructor, the researcher did an intervention to redirect his attention to top-down processing, such as asking him to think about an audio input as whole when he finished his bottom-up processing. As for John, who lacked speed and was weaker in his bottom-up processing, the researcher intervened to get him to use some top-down processing, which could yield increased inputs regarding the subject matter of the passage.

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This study found that in order to determine which process works best, one must consider: 1) the purpose for learning the second language; 2) the individual student; and 3) the listening materials used for practice. For example, the site where this research took place focused upon training students to be field independent linguists. The final learning product from this institute was graduates who could comprehend authentic listening materials (e.g., the Chinese News Report on various topics, discussion and auditoria lectures) accurately, and at high speeds. Since one of the assessments was proficiency in the aural language, language learners in this institute must have top-down processing strategies. This study contributes to the listening literature to the extent to which beginning language learners used bottom-up processing to connect the words together to comprehend their meaning.

In the course of the study, all four participants increased awareness of their own listening process and gained strategies for their listening. Previous studies have shown that, with only five or six lessons of metacognitive strategy instruction blended into listening lessons, students of all ages gained confidence, motivation, and growth in relation to listening; especially the lesser skilled listeners who experienced good results more than skilled listeners had (Cross, 2009b; Goh & Taib, 2006; Vandergrift & Tafaghodtari, 2010). After six listening lesson instructions in this study, while all participants became aware of their listening issues and applied strategies for resolution, the researcher did not see the significant score improvement after the six lesson study. However, the participants did show increased awareness of their listening process and began using strategies provided to enhance their further listening practice. The reasons suspected by the researcher to be responsible for said partial differing results in score improvement were: a) some sample students in this study had learning challenges, which called for a training time longer than six interventions. b)

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Participants in this study were in their six months language study and most of them heavily relied upon the bottom-up strategy to build their language foundation.

Limitations and Future Research

The first limitation was that this study was comprised of a convenience sample. All participants came from a class being taught by the researcher. The use of convenience sampling has its limitations, because research findings cannot be generalized. Furthermore, because of the research setting, class schedules, subject concentration level, teaching and learning resources, discipline of students, time of homework and extreme course intensity are unique to this current study and are incomparable with other advanced universities or institutes. Therefore, the research results cannot be generalized to other language learning settings.

Suggestions for future studies include an increase in sample size by collaboration across different universities or, perhaps even across different languages at different school settings. Future studies should consider comparing two or more different language programs in various learning stages to increase the validity of the research. Furthermore, the use of mixed methods would be useful to show both quantitative and qualitative outcomes for students. Quantitative research may include the use of pre and post intervention assessments scores as a way to determine if the listening intervention was successful. Alternatively, qualitative methods would provide the researcher an opportunity to gain an in-depth understanding of the different learning stages. This could provide more insight on top-down and bottom-up processing and the use of metacognitive strategies to regulate students' learning.

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Appendix A

Student Survey

Please tell me about yourself:

1. Your military branch _____ Unit _____ Rank _____
2. Marital status _____ Age _____
3. Your hometown _____
4. You are a _____ (Educational background) Major _____
 - a. High school graduate
 - b. College graduate
 - c. Some college (__ Yrs.)
 - d. Other (please specify) _____
5. Have you studied any foreign languages before? (Specify) Yes _____ No
6. If applicable, did you study the language(s) formally by taking a course? Yes No
7. If applicable, how long have you studied the language(s)? _____
8. If applicable, what is the level of the foreign language you know? _____
 - a. Beginning
 - b. Intermediate
 - c. Advanced
9. How did you like studying the language(s)? _____
10. In studying a foreign language (according to your experience), the most difficult aspect is below or your own choice _____
 - a. Pronunciation
 - b. Grammar
 - c. Vocabulary
 - d. The meaning of a word or a sentence
11. In studying a foreign language (according to your experience), _____ is/are the most difficult skills to you. (Please circle all that apply.) State the reasons on the back of the page.
 - a. Listening
 - b. Reading
 - c. Speaking
 - d. Writing
 - e. Translation
 - f. Memorizing
12. Did you choose to learn Chinese or were you assigned to the language? _____

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13. What is your DLAB score? _____

14. How well do you expect yourself to do in the study of Chinese?

- a. Very well b. I will pass c. I will see what happens. d. I'm not sure

15. What motivates you to learn Chinese well?

_____state more reasons on the back of the page

16. Please list some of your favorite activities in the study of a foreign language:

17. Your interests, hobbies or recreational activities that may be relevant to your language

learning: _____

Appendix B

Data Collection Questions

After playing the audio ONCE, the questions are:

1. What do you hear? What makes you have such ideas? Any key words?

Then, following the SECOND listening, the questions are:

2. What did you hear this time? Any new information or changes?

Then, after the THIRD time listening, the questions are:

3. What do you change this time? Why?

Overall questions:

What are your evaluations of your listening comprehension?

(What can you think of that might help you do better? Such as mental preparation, listening processing, self-correction, catching the right key words and knowing the meaning instantly)

Appendix C

Interview Questions

Planning-evaluation

Basic questions:

1. What kind of preparation do you make before listening (vocabulary, grammar, or theme)? Do you think of similar text?
2. As you listen, do you periodically ask yourself if you are satisfied with your level of comprehension? What do you do to adjust yourself during the listening?
3. After listening, what do you do?
4. Do you scaffold your listening process?
 - (a) Give me an example of what you do when you listen to a passage that has a set of questions that need to be answered.
 - (b) Give me an example of what you do when you are listening to a passage and the assignment is to summarize the key points.
 - (c) Give me an example of what you do when you need to translate the package.

Follow-up Questions:

1. Do you think back about how you listened, and about how you might do differently next time? Give an example.

Problem-solving

Base Questions:

1. What problem-solving techniques do you use when you are listening to passages that have unknown vocabulary?
2. When you realize your interpretation is not correct while listening, what do you do?

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How do you adjust to the right direction?

Follow-up Questions:

1. How can you understand new listening passages that have unknown vocabulary?
2. When you guess the meaning of a word, what do you then do to see if your guess makes sense?

Personal knowledge

Base Questions:

1. When learning a foreign language, what difficulties have you encountered and why (from reading, listening, speaking and writing or others)?
2. What in your experience and knowledge help you to understand the listening passages?

Follow-up Questions:

1. Do you feel listening comprehension in Chinese is a challenge for you? What makes you feel that way?

Directed attention

1. How often do you lose concentration during listening?
 - a. When you lose concentration, what do you do to get back on track?
2. When listening to the Chinese language, what do you do when you have difficulty understanding what you hear?