

Using a mixed methods approach to explore strategies, metacognitive awareness and the effects of task design on listening development

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Although research in the area of listening processes and strategies is increasing, it still remains the least understood and least researched of the four skills (Vandergrift, 2007). Based on research in listening comprehension, task design and strategies, this article uses a mixed methods approach to shed light on the development of four intermediate English as a second language (ESL) students' listening strategy use and awareness over the course of one semester. Specifically, we investigate the complexities of students' listening strategy use by level of language proficiency (low-intermediate to high-intermediate), the impact of repetition on listening strategies and the development of students' metacognitive awareness.

Si la recherche sur les processus et stratégies de compréhension auditive a augmenté, ce domaine reste encore le moins bien compris et le moins étudié des quatre compétences (Vandergrift, 2007). En s'appuyant sur les recherches en compréhension auditive, conception de tâches et stratégies, cet article utilise une approche multiple pour expliquer le développement de stratégies de compréhension auditive et de conscientisation chez quatre étudiants de niveau intermédiaire en anglais langue seconde (ALS) au cours d'un semestre. On examine en particulier l'utilisation complexe de stratégies de compréhension auditive par les étudiants selon leur niveau de maîtrise de la langue (intermédiaire faible à intermédiaire élevé), l'impact de la répétition sur les stratégies de compréhension auditive ainsi que le développement de la conscientisation métacognitive des étudiants.

Introduction

Research on language learning strategies has been a recurring theme in applied linguistics books and journals for over 30 years (e.g., Naiman, Fröhlich, Stern and Todesco, 1978; Wenden and Rubin, 1987; O'Malley and Chamot, 1990;

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Cohen, 1998), which highlights the complex nature of strategy use among language learners. More recently, a number of publications in the areas of applied linguistics, computer-assisted language learning and language assessment (see Vandergrift, 2003, Vinther, 2005, and Cohen and Upton, 2006, respectively) highlight the continued efforts to gain a more substantive understanding of the development and use of language learning strategies as it informs theory and pedagogy, which is necessary in helping students gain the tools they need to become more self-directed learners. While each of the four skills (listening, reading, writing and speaking) is important for second language (L2) acquisition, listening is viewed as the “primary means of L2 acquisition” (Rost, 2002, p. 103). It is also an especially important skill for international students in a university setting, where most students receive input from their professors in a lecture format, frequently in large-enrollment courses. Consequently, these learners are often relegated to the role of *overhearers* (see Buck, 2001; Rost, 2002) due to their lack of opportunity (and perhaps ability or desire) to ask questions and negotiate meaning during the lecture, which further underscores the need for effective use of listening strategies. Because students receive so much important language input aurally, they must work to develop aural proficiency skills and strategies that can help them manage the listening comprehension process in real time. Development of listening strategies in particular has been shown to lead to increased strategy use, more efficient management of the listening process and learner autonomy (Thompson and Rubin, 1996; Hauck, 2005).

The goal of this article is to contribute to the developing understanding of the impact of listening strategy instruction and the use of a common type of input enhancement (see Chapelle, 2003), namely repetition, on students’ listening processes as well as the ways in which the metacognitive awareness of four, low- to high-intermediate English as a second language (ESL) university students’ listening strategies develop over the course of a 15-week semester. Insights into this can help provide teachers with a theory-supported, pedagogical model for what they should do in the classroom and how they should design listening tasks to help students choose effective strategies for use while listening.

The purpose of this mixed methods study (Creswell, 2003) is to explore listening strategy awareness and strategy use with the intent of using this information to identify patterns. We will first conduct a qualitative exploration of listening strategies used while listening to a repeated text by collecting verbal protocol and interview data, as well as artifacts (i.e., student notes), from four low-intermediate to high-intermediate ESL students enrolled in a university-level, strategies-based academic listening course. Themes from this qualitative data will then be coded and matched to a strategy taxonomy so that hypotheses can be tested that relate strategy use with listening proficiency and task design. This qualitative data will also be used to help interpret student responses to the

metacognitive awareness listening questionnaire (MALQ) (Vandergrift, Goh, Mareshal and Tafaghodtari, 2006). In this article we will address the following research questions:

1. What are the differences in students' reported listening strategies and processes, by level of language proficiency, when listening to an academic text?
2. What impact does repetition have on listening strategies used while listening to academic texts?
3. How does the metacognitive awareness of these students' listening strategies develop over the course of the semester?

Higher-proficiency learners are hypothesized to use more metacognitive strategies (Vandergrift, 1997; Goh, 2000; Smidt and Hegelheimer, 2004), while lower-proficiency listeners are expected to use more cognitive strategies and rely more exclusively on either bottom-up or top-down processing rather than a combination of the two. While research on repetition and listening strategies is currently lacking, proponents of the interactionist approach to second language acquisition (SLA) suggest that repetition is a valuable form of input enhancement. We therefore believe that repetition, in the form of listening to a full text twice, will allow lower-proficiency listeners an opportunity to build a framework for comprehending input in a coherent manner. We also expect to see an increase in students' metacognitive awareness over the course of the semester due to their being enrolled in an academic listening strategies course; it is hoped that this explicit strategy instruction will help students to become more aware of the strategies they use and can use while listening to various academic texts.

We will first review relevant literature in the areas of listening processes, repetition and strategy training before outlining our research methods and data analysis procedure to answer these three research questions. Finally, we will present our results and discuss them in light of past research findings. We will conclude by discussing implications of our findings and offering suggestions for future research.

Processing aural input

Listening is an active and complex process in which listeners must identify sounds and lexical items and make meaning of them through their grammatical structures, verbal and non-verbal cues and cultural context. Listening strategies researchers refer to two types of processes that learners use to make meaning of aural input: bottom-up, where listeners use their linguistic knowledge of sounds and word forms and build up to more complex lexical items and grammatical relationships to comprehend the input and top-down, where prior

experience, real-world knowledge or familiarity with the listening context help the listeners to interpret an utterance. These processes are not used exclusive of each other, but rather alternate and combine to help the listener make meaning (Vandergrift, 2002). While this is typically true of all learners, research has shown that successful and less successful listeners process input quite differently from one another. Peterson (2001) states that less successful listeners tend to rely primarily on either top-down or bottom-up processing and spend great amounts of conscious attention on perceptual activity (e.g., identifying word boundaries, recognizing meaningful sound units) so little is left over for higher-level operations (e.g., relating new information to that stored in long-term memory). In contrast, higher-proficiency listeners use both top-down and bottom-up processes to make meaning of aural input.

Processing aural input for comprehension requires learners to relate the incoming information in real time to what they already know. The immediacy with which listeners need to meet communicative goals has highlighted the need for both designing listening materials in a way that allows learners to practice listening at their own pace and level, and explicit listening training. One way in which teachers can help their students practice listening is to design materials that allow for listening texts to be repeated.

Repetition and listening comprehension

Hatch (1983) proposes that repetition and restatement of input benefits learners by allowing them more time to process information in the input as well as the relationships between syntactic forms. Anderson (1985) notes that when the learner's combination of syntactic and semantic processing are "in conflict . . . comprehension is hurt" (p. 347). In his discussion of input processing theory, VanPatten (2007) agrees that processing input for both meaning and form is essential to comprehension, but notes that "learners process [meaning] in the input before anything else" (p. 117). Consequentially, low-level listeners who spend most of their time processing meaning may not have the opportunity to process forms when listening to a text for the first time due to limitations of both time and working memory capacity.

In a recent study, Jensen and Vinther (2003) studied the effect of exact repetition and speech rate reduction on eighty-four intermediate Spanish speakers' comprehension of dialogues seen in video recordings. The authors hypothesized that learners would try to extract meaning from an utterance during the first time listening, and that during the second time, learners will already have located "the problematic features in the stream of sound" (p. 380) which will help them focus on forms and therefore, help aid their detailed level of comprehension. They compared the results of two treatment groups, which listened to the video conversations a total of three times each although at different rates

of speech (fast-slow-fast or fast-slow-slow), and a control group, on performance of an elicited imitation task. While there was no significant difference between the two treatment groups in terms of comprehension, students from both groups were found to comprehend the material significantly better than students in the control group. The authors thus concluded that repetition allowed students to first process meaning and then reformulate hypotheses about language form and meaning during the subsequent listening.

Jensen and Vinther's (2003) study mirrors a number of others that have also concluded that repetition has a positive effect on listening comprehension. Cervantes and Gainer (1992) investigated the effects of syntactic simplification and repetition on the listening comprehension of 76 university-level English as a foreign language (EFL) learners. The authors found that repetition resulted in significantly higher comprehension scores. In another example, Cabrera and Martinez (2001) found that making use of repetitions, comprehension checks and gestures helped 60 EFL school children better follow a story told by their instructor. Elkhafaifi (2005), investigating the impact of prelistening activities and repeated listening exposure on listening comprehension scores of Arabic as a foreign language students, concluded that "the single most important factor in improving listening comprehension is repeated exposure to the listening passage" (p. 510).

While repetition can give lower-proficiency listeners an opportunity to process input for both meaning and form individually and without the constraint of time, listening strategy training can help learners become more aware of the various listening processes used by successful listeners and decide when to use them. This training can then enable learners to guide and evaluate their own comprehension, as well as to help them work with more difficult material (Vandergrift, 1999).

Listening strategy training

Listening strategy training is part of the broader area of language learning strategies, which include both learning and use strategies. Together, these strategies "constitute the steps or actions selected by learners to either improve the **learning** of an L2, the **use** of it, or both" (Cohen, 1996a, p. 5, emphasis in original). In the past, the goal of discovering which strategies learners used was to compare strategies of more and less effective language learners (see Rubin, 1975; Naiman *et al.*, 1978). This research led to a number of strategy taxonomies that named, classified (e.g., cognitive, metacognitive, social, affective) and exemplified how various strategies were used.

More recent research on language learning strategies has shown that what makes a successful L2 learner and user is more dependent on the learner's *choice* of strategies for a given task or situation (Cohen, 1996b, 1996c; Chamot

and El-Dinary, 1999; Khaldieh, 2000; Vandergrift, 2007) rather than the actual *strategy*. A number of studies in listening research support this statement. For example, O'Malley, Chamot and Küpper (1989) used verbal protocol methods to compare the listening strategies of effective and ineffective high school ESL students, as well as to see whether the strategies students used paralleled Anderson's (1985) three theoretical phases of listening comprehension. They found that effective and ineffective listeners varied as to the strategies they chose to use during the various phases of listening comprehension. More effective listeners made greater use of both bottom-up and top-down processes, while less effective learners became fixated on individual word meanings. Vandergrift (2003) compared listening comprehension strategies of seventh-grade, Canadian French students ranging from more to less skilled. Students were instructed to think-aloud while listening to several French texts. Vandergrift found that the more skilled listeners used more metacognitive strategies, such as comprehension monitoring, than the less skilled students. The less skilled students were found to use more translation as they listened.

Chamot (2005) states that descriptive studies such as those above have "confirmed that the good language learners are skilled at matching strategies to the task they were working on, whereas less successful language learners apparently do not have the metacognitive knowledge about task requirements needed to select appropriate strategies" (p. 116). This type of knowledge, described by Wenden (1991) as "the part of long-term memory that contains what learners know about learning" (p. 45), underlies learners' abilities to "manage, direct, regulate, [and] guide their learning" (Wenden, 1998, p. 519). In fact, research on strategy use by effective and less effective listeners has found the use of metacognitive strategies to be particularly important for enhancing success (see O'Malley and Chamot, 1990; Vandergrift, 2003). In addition, learners who have regular opportunities to develop their metacognitive awareness through training may become more autonomous language learners (Hauck, 2005). Thus, it is an important goal for any strategy training program to not only teach students a variety of strategies, but also to help raise students' metacognitive awareness of the learning process. Consequently, this mixed methods study investigates the listening strategies used by four students enrolled in an ESL listening strategies course at a major Midwestern university, the ways in which these strategies differ according to the students' proficiency levels, the ways in which repetition impacts listening strategies used and the influence of strategy instruction on students' metacognitive awareness of strategies used while listening to oral texts.

Methods

This mixed methods study relies primarily on qualitative data in the form of verbal protocols, as well as refers to semi-structured interviews and student notes to support findings from the verbal protocols, to investigate the complex processes in which four ESL students engage while listening. Mixed methods research recognizes that “*both* quantitative and qualitative research [methods] are important and useful” (Johnson and Onwuegbuzie, 2004) and seeks to use both in either a single study or “a program of study” (Creswell, 2003, p. 218). Using a concurrent nested strategy guided by qualitative data collection methods (Creswell, 2003), the verbal protocol data is quantified in order to allow for a comparison of quantitative results (strategy frequencies) with qualitative (verbal protocol) data. This study also employs a sequential explanatory strategy (Creswell, 2003), where the interpretation of quantitative, Likert-scale questionnaire data is supported by qualitative data, to explore students’ metacognitive awareness of strategies used while listening to oral texts. Though mixed methods designs can pose challenges for a researcher, such as the need to be familiar with both qualitative and quantitative research methods, the use of both can provide tremendous insight when investigating a complex issue like listening strategies. While this research was closely tied to a listening course, save for the MALQ, all data were elicited by an outside researcher unknown to the students in an attempt to increase the internal validity of the study, which Chapelle and Jamieson (1991) define as “accurate attribution of observed experimental results to the factors that were supposed to be responsible for the results” (p. 38).

Participants

The participants in this mixed methods study were four male students enrolled in an ESL listening course at a large Midwestern research university; while the course had twelve students enrolled, these four students were the only ones to agree to participate in the research study. Of the four, two (DL and MS) were graduate and two (PN and HS) were undergraduate students. The four students were placed into this listening course as the result of their score on the listening section of the English Placement Test (EPT) they took upon entrance to the university. The listening section consists of academic lectures followed by multiple-choice questions and is intended to assess students’ academic listening ability. While the students placed into the same course, their listening proficiency levels differ from high-intermediate (DL) to low-intermediate (MS, HS). A brief profile of each student can be seen in Table 1.

The course in which these students were enrolled focused on classroom-based listening strategies to be used while listening to academic lectures. The classroom-based listening strategies covered during the semester centered

Table 1: Overview of participants

Student	Native language	Class status	EPT score ^b	TOEFL score (computer-based)	Class standing ^a (points)
DL	Chinese	Graduate	16	233	413.0 (high)
PN	Chinese	Undergrad	16	230	359.0 (med)
MS	Arabic	Graduate	14	203	201.5 (low)
HS	Korean	Undergrad	14	190	227.5 (low)

^aThe class standing value is the number of points students received on comprehension quizzes given through the semester out of a total of 453 points.

^bOut of 30 points total.

around listening to academic lectures in a university setting, and included listening for lecture cues, taking notes, listening to numbers and statistics, and listening for additional indicators of academic lecture organization; these are not to be confused with the cognitive and metacognitive listening strategies identified by O'Malley and Chamot (1990), Oxford (1990) and Vandergrift (1997, 2003).

Central to this course were a series of instructor-designed podcasts, which were closely aligned to the course goals and content and assigned as homework (see O'Bryan and Hegelheimer, 2007, for a detailed discussion). There were a total of 5 units in the course textbook dealing with different types of classroom-based listening strategies and students listened to 14 podcasts over the course of the semester; each podcast focused on either demonstrating or encouraging students to review and practice the listening strategies discussed in class. One summary podcast was assigned at the end of each strategies unit. In this podcast, the instructor first reviewed the classroom-based strategy concept(s) covered in class and then introduced a number of lecture excerpts that would follow; students were encouraged to use the strategies covered in that unit while listening. Upon training students to effectively utilize the podcasts for their assignments, repetition of the podcast was encouraged.

Listening texts

The listening texts used for the present study were heavily impacted by the course podcasts discussed above. Since students were exposed numerous times to the podcast format described above throughout the class, the listening texts used in the study followed roughly the same format. Each audio file began with a relatively short (from 30 seconds to 2 minutes) introduction by the instructor in which she reminded students of the classroom-based listening strategies discussed in that unit and encouraged them to use the classroom-based strategies while listening. This introduction was followed by a longer (3 to 5 minutes), more formal excerpt (e.g., a lecture or radio broadcast excerpts). These more

formal excerpts differ slightly in the degree of formality and scriptedness, e.g., lectures can sometimes contain humorous anecdotes and a radio broadcast is likely more scripted than an academic lecture. While the language may differ slightly, what they have in common is the role into which they place the listener. With both lectures and broadcasts, there is no audience participation; the listeners are unable to negotiate meaning or ask questions, and therefore are likely to use similar types of listening strategies when listening to either type of text. In an attempt to control for prior knowledge, the topics for each formal excerpt stemmed from either the social sciences or popular culture, were freely available, and were of general interest. Texts with overly technical terms were avoided. An overview of the listening texts can be seen in Table 2.

Table 2: Overview of podcasts

Podcast	Duration	Accent ^a	Topic	Source
1	3:54	British	Earthquake prediction and mitigation	Academic lecture at the Massachusetts Institute of Technology (MIT)
2	5:30	American	Anecdote from author's book about public opinion research for Diet Pepsi	Invited Lecture presented at the Technology, Education and Design (TED) talks
3 ^b	5:45	American	Marketing houses for sale in a slumping housing market; Universities asking for money from alumni	Two short radio broadcasts from National Public Radio's (NPR's) Marketplace program
4	8:31	American	Cholera outbreak in 16th-century London	Invited Lecture presented at the TED talks

^aAll speakers were male.

^bAll podcasts contained one excerpt except podcast 3, which contained two short excerpts from NPR. This was done to provide students with listening texts of roughly the same duration.

Verbal protocol

Verbal or "think-aloud" protocols were used to elicit online or real-time strategies used while listening (see Ericsson and Simon, 1993). With this method, individual learners are asked to voice their thoughts while working through a language task. Many times, an interviewer sits with a student while he/she completes the tasks and asks questions such as "What are you thinking?" and "Why did you decide to do that?". The think-aloud is recorded and analyzed afterwards for evidence of learning strategies students used while completing the task, and students can typically use either their native or second language. Verbal protocols have allowed researchers access to online, or real-time

processing rather than just retrospective accounts. Many have found this method of assessment to produce positive effects, especially with regard to retrospective verbal reports (Crutcher, 1990; Swanson-Owens and Newell, 1994), although there are also some critics (see Stratman and Hamp-Lyons, 1994) of the verbal protocol method. In the absence of access to functional MRI scans or other technological advances that will without doubt track cognitive activity, we felt that the use of verbal reports with sufficiently trained participants was the best choice of data collection.

Semi-structured interviews

Short, semi-structured interviews took place after each of the four data collection sessions. The purpose was to elicit the learners' own evaluations of how their listening comprehension had changed since the beginning of the semester and whether they felt they were developing as a strategic listener (and how). Although these interviews lasted only a few minutes in length, this information helped support findings gained from the pre- and post-metacognitive awareness listening questionnaire.

The Metacognitive Awareness Listening Questionnaire

During the first and last week of the course, the students were asked to complete the Metacognitive Awareness Listening Questionnaire (MALQ) (Vandergrift *et al.*, 2006), a Likert-scale questionnaire designed to assess L2 learners' metacognitive awareness and perceived use of strategies while listening. The MALQ asks students to listen to a short text and respond to 21 statements such as "I translate in my head as I listen" and "I have a goal in mind as I listen" on a scale of 1 to 6, with 6 indicating they "strongly agree" with the statement and 1 indicating they "strongly disagree". This questionnaire, which was developed based on Flavell's (1979) three-part model of metacognitive knowledge (i.e., person, task and strategy), provides measures on five distinct, metacognitive factors which were modeled on constructs related to metacognitive awareness and self-regulation of L2 listening comprehension: problem-solving, planning and evaluation, lack of mental translation, personal knowledge and directed attention. Table 3 provides a description of the strategies represented by each of these five factors based on Vandergrift *et al.* (2006).

Each of the 21 statements on the MALQ is related to one of the five factors identified in Table 3. While the complete list of MALQ statements and corresponding factors can be found in Vandergrift *et al.* (2006, p. 462), Table 4 shows a sample of MALQ items and their corresponding factors. As recommended in the literature, the questionnaire was used as a "pretest-posttest to chart the impact of listening strategy instruction and to assess learners'

Table 3: Description of each metacognitive factor measured by the MALQ

Metacognitive factor	Strategies represented
Problem-solving	Making and monitoring inferences; includes problem-solving, knowledge retrieval and monitoring processes
Planning and evaluation	Preparing for listening and evaluating results
Mental translation	Translating (to be avoided if one is to become a successful listener)
Person knowledge	Assessing perceived difficulty of listening passage, anxiety and self-efficacy in listening
Directed attention	Maintaining attention and controlling train of thought

growing awareness of the processes underlying successful L2 listening” (Vandergrift *et al.*, p. 453).

Table 4: Sample MALQ items and corresponding metacognitive factors identified by Vandergrift *et al.* (2006)

Metacognitive factor ^a	Strategy or belief/perception
Planning and evaluation	Before I start to listen, I have a plan in my head for how I am going to listen.
Directed attention	I focus harder on the text when I have trouble understanding.
Personal knowledge	I find that listening in English is more difficult than reading, speaking or writing in English.
Mental translation	I translate in my head as I listen.
Problem-solving	I use the words I understand to guess the meaning of the words I don't understand.

^aTable adapted from Vandergrift *et al.* (2006).

Student notes

In an attempt to make the research context as authentic as possible, all students were allowed to take notes while listening to the formal excerpts. However, the amount of information noted varied considerably by student and by text. Relevant excerpts from the notes are included to support the findings.

Procedure

To answer the first two research questions of this study concerning strategy use and repetition, a verbal protocol procedure was used. This think-aloud procedure was adapted from Vandergrift (1997, 2003) and had two separate phases: a training phase and a data collection phase. The training phase was conducted prior to the data collection sessions and was based on a text that they had heard previously on one of the course podcasts. The data collection sessions were scheduled a month apart in order to correspond to the units the students were

working with in the listening class. In total four data collection sessions, lasting from 30 to 50 minutes each, were conducted individually with each of the four participants (16 sessions in total). Participants were given the choice to think aloud in either their native language or in the target language (English); all students chose to think aloud in English. The sessions were recorded with a digital audio recorder.

Each session following the training session included three main stages: an informal warm-up with casual conversation, a brief reminder of what the participants were supposed to do while listening to the podcast and the verbal report stage where students listened to the podcast twice and voiced their thoughts. Again following Vandergrift's (1997, 2003) methodology, during the think-aloud portion the text was listened to twice; the first time, the listening text was paused at breaks indicated on the tape script and participants were asked to verbalize what they were thinking. If the participant was unsure of what to say, the investigator used prompts such as "Tell me what you're thinking" to encourage the participants to share their thoughts. Following the first round of listening, students listened to the text again but rather than voicing their thoughts during pre-determined pauses, they were asked to stop the podcast when they had something to add to their thoughts voiced the first time. Students were allowed to take notes while listening. Following the think-aloud procedure, students were asked to reflect on their level of listening comprehension (see 'Semi-structured interviews' above).

To answer the third research question regarding development of metacognitive awareness, the MALQ was administered at both the beginning and end of the course. To help provide students with a context for answering the questions, a short radio broadcast was played before students completed the MALQ, as suggested by Vandergrift *et al.* (2006).

Data analysis

Verbal reports were first transcribed verbatim using the qualitative analysis software Transana (Woods and Fassnacht, 2007). Next, following the suggestion by Mackey and Gass (2005) to enhance interrater reliability, 25% of the verbal reports (4 of the 16) were coded by both investigators. This process yielded an interrater reliability percentage of 96%; disagreements over the remaining 4% were discussed and resolved and the coding schema was modified if necessary. The remaining verbal protocols were then coded by one of the investigators using an open-coding approach and later matched to a predefined taxonomy of listening strategies identified by Vandergrift (1997, 2003). This taxonomy includes cognitive, metacognitive and socio-affective strategies identified by O'Malley and Chamot (1990) and refined by Vandergrift (1997) for listening in particular. Although instances of socio-affective

strategies were not seen in the verbal reports, this finding is similar to what Vandergrift (1997) also found. Transana was used to facilitate the coding process and create a seamless link between the coding scheme and particular points on the digitized file containing each verbal report; this allowed for easy review by the second coder when questions arose. A comprehensive list of listening strategies (Appendix) includes definitions and verbatim examples (i.e., errors are not corrected).

To address the first research question, which looks at strategies and processes (e.g., bottom-up, top-down) used by learners of different proficiencies, strategies reported by each student were tabulated, tallied, and the percentages of metacognitive and cognitive strategies used for each student were calculated (see Table 5). In addition, qualitative analysis in the form of thematic coding was carried out on both the verbal report transcripts and the notes taken by students while listening to each text in order to provide support for strategies and processes reported in the think-aloud sessions.

Research question 2 looks at the impact of repetition on students' listening strategies by building on the data used to answer the previous research question. Students' verbal protocols and notes were analyzed for evidence of strategies used while listening to a lecture excerpt the first and then second time.

The third research question looks at the development of students' metacognitive awareness throughout the semester. To do this, results from the MALQ were first compiled and the differences between pretest and posttest were calculated for three students, as one student was not available to complete this part of the research (see Table 6). These differences indicate changes in metacognitive strategy awareness on each of the five factors identified by Vandergrift *et al.* (2006). In addition, questionnaires and semi-structured interviews were analyzed qualitatively in order to support data interpretation.

Results and discussion

Strategy use and listening processes

Based on past research, we anticipated that the higher proficiency listeners (DL and PN) would use more metacognitive strategies than the lower proficiency listeners, whereas the other two students who are lower proficiency listeners would rely more on cognitive strategies. In addition, we expected higher level listeners to use both bottom-up and top-down processes while listening, which has been shown to lead to more successful understanding of aural texts. In contrast, the lower level listeners were expected to rely more on either bottom-up or top-down processes, but not alternate between the two as much.

Table 5: Total strategies used per student

	DL ^a	PN ^b	MS ^c	HS ^d
A. Metacognitive				
Advance organization	2 (4.35%)	0	0	3 (4.48%)
Selective attention	0	1 (2.22%)	0	0
Comprehension monitoring	1 (2.17%)	4 (8.89%)	6 (9.84%)	6 (8.96%)
Double-check monitoring	2 (4.35%)	8 (17.78)	9 (14.75%)	5 (7.46%)
Evaluation	0	0	1 (1.64%)	0
Problem identification	3 (6.52%)	3 (6.67%)	1 (1.64%)	9 (13.43%)
Total	8 (17.39%)	16 (35.56%)	17 (27.87%)	23 (34.33%)
B. Cognitive				
Inferencing	1 (2.17%)	0	4 (6.56%)	1 (1.49%)
Linguistic inferencing	0	0	1 (1.64%)	1 (1.49%)
Extralinguistic inferencing	2 (4.35%)	0	0	1 (1.49%)
Between-parts inferencing	1 (2.17%)	1 (2.22%)	0	0
Elaboration	1 (2.17%)	0	3 (4.92%)	0
Personal elaboration	2 (4.35%)	0	0	0
World elaboration	0	0	3 (4.92%)	1 (1.49%)
Creative elaboration	0	0	3 (4.92%)	2 (2.99%)
Summary	30 (65.23%)	28 (62.22%)	29 (47.54%)	38 (56.72%)
Repetition	1 (2.17%)	0	1 (1.64%)	0
Total	38 (82.61%)	29 (64.44%)	44 (72.13%)	44 (65.67%)

^ahigh-intermediate ^bintermediate ^clow-intermediate ^dlow-intermediate

Total reported strategy use

The data in Table 5 presents the total number of strategies used by each of the four students throughout the research period. The raw total of strategies used is shown, but a percentage based on total strategies used is compiled and used in the analysis in order to account for the amount of talking done by each student, which can vary for a number of reasons (e.g., interest, motivation, comfort level, etc.). The table is arranged so that DL, the highest-proficiency student, appears on the left and HS, the lowest-proficiency student, appears on the right; PN and MS are placed appropriately.

Overall, the four students used more cognitive strategies than metacognitive strategies, with summary being by far the most widely-used cognitive strategy by all students. When comparing the percentage of metacognitive strategies used by the students at different proficiency levels, there seems to be a cyclical pattern to their use; DL used by far the fewest while PN used the most, followed by HS and then MS. Socioaffective strategies were not reported by students during the research period.

Metacognitive strategy use

Although the cyclical pattern seen in the total percentage of reported metacognitive strategies is counter to what has been reported in the past (see Vandergrift, 1997; Smidt and Hegelheimer, 2004), a more in-depth look at the specific strategies used yields some interesting findings. Reported use of advanced organization by DL and HS was surprising, as the listening text did not lend itself well to planning before each listening. Because students listened to each podcast after completing a strategy unit in the course, each podcast began with the instructor reviewing the classroom-based listening strategies covered in class up to that point and previewing the content of the passage they were going to hear. The majority of the time these students tended to summarize this part while thinking out loud; however both DL and HS added information to what the instructor said (e.g. "I can try to find the main idea"), reflecting an advanced organization strategy.

While monitoring strategies were used by all students, both PN and MS used more double-check monitoring than any other metacognitive strategy, suggesting that these students both relied heavily on the second time listening to the text to check and modify hypotheses made during the first listening. This hypothesis is strongly supported by the think-aloud data and will be discussed in the section on processes and strategies used during the second time.

One other interesting finding is that HS, the lowest-proficiency student in the group, used a large number of problem identification and comprehension monitoring strategies. According to the coding schema presented in the Appendix, both strategies centre around identifying places in the text where the student's level of comprehension changes is verified, or breaks down. The difference is the level of specificity with which the student can identify the problem, with comprehension monitoring being a more general problem at the local level (e.g., "I don't understand this part") and problem identification pinpointing a very specific problem (e.g., "It says something about charity and tax deductions and something"). While HS reported the greatest number of these points, DL reported the lowest number, suggesting that he was more successful at understanding the text and had less need for using these strategies.

In sum, the three mid- to low-intermediate learners, PN, MS and HS, used the largest percentage of metacognitive strategies; the highest-proficiency learner, DL, used by far the smallest percentage. However, despite the small number of participants, the most interesting finding is the relationship between metacognitive strategies used and understanding of the text during the first time listening. The frequent use of double-check monitoring indicates these students' need for listening a second time in order to verify comprehension from the first round. Based on principles from the input processing theory (see VanPatten, 2007), this may be due to students' processing the input for meaning rather than form during this first time listening; repeating the input could,

then, allow students to process the forms of the input which would help them create a more holistic understanding of the text. In contrast, the low number of metacognitive strategies used by DL indicates his ability to understand most of the information in the text during the first time listening. Because he is a higher-proficiency listener, it is likely that he is able to process the input for both meaning and form during the first time listening, and therefore obtain a more complete understanding of the text after listening just once. Clearly, additional research with a greater number of participants is required to support these findings.

Cognitive strategy use

In terms of cognitive strategy use, the data in Table 5 show that DL and PN used few strategies beyond merely summarizing the text; when they did, these strategies were often ones that went beyond simply processing information at the local level. For example, both students used between-parts inferencing to successfully relate information from one part of the text to something encountered previously in the text. Rather than just trying to make the text more comprehensible at the local level, a characteristic of low-level learners (Gordon, 1987), DL instead built upon concepts or events from the text with his own knowledge in order to link the new information to what he already knew or had experienced. This can be seen in a verbal report excerpt below while he listened to a lecture on London's sanitation infrastructure in the 1850s and its impact on the cholera disease; DL elaborated with information he had about that time period in China's history:

And I cannot imagine London was like that at the time. China just lost a war to British and French at that time in 1840, the Opium War, and I think at that time Beijing's much better because the people — how they deal with the droppings. They have farmers carry those droppings out of the city. There is even a pass for this. You know the city is like this, there are city walls, several gates, and I think the, like droppings come out from some specific gate. (DL, interview 4, second time)

In contrast, MS and HS made frequent use of inferencing and elaboration strategies while processing information at the local (sentence/word) level. Creative elaboration, used a total of five times by these two students, was often used to make meaning of the text during the second listening. During a lecture summarizing a research study on Diet Pepsi, the lecturer says an amusing statement using the word "horseradish". HS was confused about this word the first time but used extralinguistic inferencing to deduce it was a joke. The second time he heard this part of the text, HS still did not understand the meaning but demonstrated creative elaboration, as shown below:

... he said 'horseradish', it's maybe, it's actually some design, so it's very funny design, so many people laugh at it. (HS, interview 2, second time)

HS engages in a top-down process by using his knowledge about what constitutes something humorous (i.e., people laugh) to make meaning of the text; however, he limits his interpretation of the text to the local level. Had he stepped back to get a more global perspective of the entire text, he would have realized that his interpretation did not make sense given the rest of the content. This is a difference that has characterized low- and high-proficiency students in previous research on language testing, reading and listening strategies (Kleiman *et al.*, 1986; Gordon, 1987; O'Malley, Chamot and Küpper, 1989)

Overall, the cognitive strategies were primarily used to form a mental representation of the text and to compensate for gaps in comprehension. Also interesting is the difference in use of elaboration strategies by high- and low-proficiency students. DL used personal elaboration to form a connection between information in the text and knowledge that he had previously at the global level. This is a sophisticated form of top-down processing that is in contrast to HS's use of top-down processing. He used elaboration strategies as a way to understand information at the local level rather than step back and look at the text as a whole. Had he been given a third chance to listen to the text, it is possible that he could have used his hypothesis that 'horseradish' is a design to try to make connections between that information and additional pieces of information in the text.

Impact of repetition on strategy use

While the overall strategies used by these four students differ considerably, there was also a difference in the strategies used and level of comprehension attained by the students during the second listening, a finding not reported in past literature. One example is seen with MS when listening to a text about how realtors cope in a declining housing market. MS produces a disjointed summary while listening the first time as seen in the following think-aloud excerpt:

It's a advertisement and in a video it's about magazines or something like that. A man talked about 5 months for something what, but it will cost a 1/2 million dollar. And I hear 360 degree and in the end they told that video creates emotion. (MS, interview 3, first time)

Vandergrift (1997) claims this "sparse and disjointed summarization" (p. 486) is characteristic of less skilled listeners who engage in more translation and less comprehension monitoring, which results in superficial inferences, elaborations and interaction with the text in general. While using a summary

strategy, MS seemed to be merely regurgitating details heard in the text without much attempt to piece them together and use them to fully understand the text. The same summary strategy is used during the second listening, but here he exhibits a much more coherent level of understanding:

He talked about advertisements like in magazines or space or high ceilings and multiple shower heads. There are 360 degrees of tours and he mentioned that one tour charges 500 million dollar and he talked about with, I think he's a businessman or seller . . . (MS, interview 3, second time)

These two examples help us gain insight into the impact of repetition on MS's cognitive processes. During the first time listening, MS relied primarily on a low-level, bottom-up approach to processing the text by focusing almost exclusively on individual lexical items. The relationship between these items does not seem to come into play at this point. In the second example, there remains a heavy reliance on bottom-up processing, although the relationship between these lexical items becomes more apparent. While this gradual change is certainly seen in the think-aloud data, it is also exemplified in the content and organization of MS's notes. In the unit before MS listened to this podcast, students in the listening class learned about how to visually portray relationships in their notes, for example by using headings, bulleted points and arrows. During the first listening, MS's notes closely resembled a bulleted list with very few headings. During the second listening, MS made greater use of headings such as "Housing Market" and "Magazine, space, high ceilings". Beneath this second heading, which was also voiced in the think-aloud example above, MS included a bulleted list with items such as "multiple shower heads", "360 degree tours", and "charges 500 mill\$ for tour".

This enhanced organization lends support to the claim that the second listening allowed MS to build up to more complex bottom-up processing strategies, namely using lexical and grammatical relationships to comprehend the input and utilize the information gained from the text to make meaning. Marschal (2002) hypothesized that strategies such as inferencing, monitoring and elaboration, would help learners develop a framework for understanding language that results in a more coherent and complete summarization of the input. MS did not report using these strategies while listening; rather, having the opportunity to repeat the text is what facilitated the creation of this framework, resulting in a more coherent summary the second time.

Development of metacognitive awareness throughout the semester

Because the MALQ was completed before and after receiving listening strategy training, it was hypothesized that on the factors planning and evaluation, directed attention, personal knowledge and problem solving, which contain items that "represent processes underlying successful L2 listening" (Vandergrift *et*

al., 2006, p. 453), the difference would be positive; this would be indicative of students' increased awareness of their use of these listening processes. In contrast, because the mental translation factor contains items representing processes used by more unsuccessful listeners, it was hypothesized that the difference in students' pretest and posttest scores would be negative; this would again be indicative of the students' increased awareness of their (ideally) decreasing use of these listening processes. Although Vandergrift *et al.* do not provide a mapping of the listening strategies which correspond to the five factors on the MALQ, we have attempted to map each of the five factors assessed on the MALQ to corresponding metacognitive and cognitive strategies defined in the Appendix in order to clarify our interpretations of these results (see Table 6).

Table 6: Mapping MALQ factors and listening strategies

MALQ factor	Corresponding strategy/strategies
Problem solving	Inferencing, Elaboration, Evaluation, Monitoring, Summary
Planning-Evaluation	Planning, Evaluation, Monitoring, Problem identification
Personal knowledge	No strategy identified
Mental translation	Translation
Directed attention	Selective attention, Monitoring, Problem identification, Repetition

Changes in metacognitive awareness

Table 7 shows the pre- and post-MALQ scores for 3 of the 4 students; as stated earlier, MALQ scores for PN are missing due to class absences on the days on which the MALQ was taken. According to the mean difference reported in Table 7, the biggest gain was made in the awareness of problem solving strategies which include inferencing, elaboration, evaluation, monitoring and summary (see Table 6). This gain is supported by the data presented in Table 5, as strategies (i.e., monitoring, summary, etc.) in this group were used far more frequently during the think-aloud sessions than those in the other factor categories.

An increase in personal knowledge strategies follows. Items concerning this factor on the MALQ include statements such as "I feel that listening comprehension in English is a challenge for me". This kind of reflection on one's strengths and weaknesses is difficult to elicit during think-aloud sessions, which is why no corresponding strategy from the Appendix could be mapped to this factor in Table 6. However, we were able to observe a change in students' awareness of their strengths, weaknesses and strategies that may help in overcoming these weaknesses when analyzing the semi-structured interviews.

Table 7: MALQ scores^a

Student	DL	MS	HS	Mean difference
Problem solving:				
Pre	27	28	19	
Post	31	32	25	4.67
Diff	4	4	6	
Planning and evaluation:				
Pre	13	22	17	
Post	10	22	21	0.00
Diff	-3	0	3	
Personal knowledge:				
Pre	4	15	8	
Post	12	12	9	2.00
Diff	8	-3	1	
Mental translation:				
Pre	4	11	9	
Post	3	12	13	1.33
Diff	-1	1	4	
Directed attention:				
Pre	11	19	16	
Post	15	18	17	1.33
Diff	4	-1	1	

^aThe mean difference values are presented for informational purposes only and need to be interpreted with caution due to the small number of participants

When asked how he felt about his listening development from the beginning of the semester, DL, who demonstrates the biggest shift in personal knowledge strategies in Table 7, referred to the classroom-based listening strategies when he answered “I think I improved. Because now I’m aware of the [lecture] cues, numbers” (DL, interview 4). DL directly tied his perceived improvement with the awareness of the classroom-based listening strategies he learned during the listening course. In another example, HS began reflecting on his strengths and weaknesses when asked during the final think-aloud session to reflect on the texts he heard:

I can’t understand everything, but I can heard some point. And then in my brain I arrange it about the information which I heard and then I describe with some situation. It’s not exactly but it is similar to the topic. So if I heard it one more, two more, I can understand what this mean.

In addition to identifying his strengths and weaknesses, HS also identified a strategy, namely listening more than once, that could help him overcome his

weaknesses. This demonstrates his growing awareness of what he can do currently and what he needs in order to understand complex, aural information.

There was little change in the awareness of directed attention strategies despite the fact that a number of monitoring and problem identification strategies were used by the students during the think-aloud sessions (see Table 5). This is likely due to the fact that most of the MALQ statements that load onto the factor Directed Attention (see Vandergrift *et al.*, 2006, p. 462) contain assertions such as “When my mind wanders I recover my concentration right away” and “I try to get back on track when I lose concentration”. Similar to the Personal Knowledge items, it is difficult to elicit these types of beliefs while using think-aloud protocols. However, we did see a link between the Directed Attention statement on the MALQ reading “I focus harder on the text when I have trouble understanding” and the strategies selective attention, monitoring, problem identification and repetition; these strategies were used frequently and indicate a conscious effort to focus on either specific or general aspects of the text when there are comprehension breakdowns.

On average, there was no change in the awareness of planning and evaluation strategies used by the students, yet there was a slight increase in the perceived use of mental translation strategies. Again, we expected to see a decrease here based on the fact that unsuccessful learners typically rely on this strategy; we had hoped that throughout the semester, the students would rely less on translation-type strategies and more on the classroom-based listening strategies studied during the course. This increase is also interesting since no student indicated the use of a translation strategy during the think-aloud procedure. While this may indicate that the students were unclear of what translation strategies entailed, it seems unlikely as mental translation statements on the MALQ included simple phrases such as “I translate in my head as I listen” and “I translate key words as I listen” (see Vandergrift *et al.*, 2006, for a complete copy of the MALQ). Although these students were not advanced-level listeners, their overall level of English proficiency was high enough that they were admitted into the university; it is likely that they understood these simple sentences on the MALQ due to their adequate level of English proficiency, and the fact that they did not ask questions while completing the MALQ indicates that they understood the statements they were responding to. However, we cannot be absolutely sure as the students were not asked this directly.

When we look beyond the overall mean value of the mental translation strategies shown in Table 7, it is clear that HS, the lowest-proficiency learner in the group, viewed himself as using significantly more mental translation strategies than when he began the course. Although the reason for this change is unclear, and he did not indicate using this strategy during the think-aloud sessions, we could see from his notes taken during two of the four texts that he did

write certain terms in his native language. One example concerns HS's struggle with the word "horseradish", mentioned during the second podcast, which was discussed at length previously. In his notes, we saw that HS attempted to write the sounds of the word in English using Korean symbols. While this is not a direct translation, HS was clearly thinking in his native language while trying to come up with the meaning for the word "horseradish". This coincides with Vandergrift's (1997) findings that lower-proficiency listeners tend to use more translation strategies than higher-proficiency learners.

Conclusion

To conclude, using both qualitative and quantitative research methods has provided us with insight into students' listening comprehension processes and strategies, the impact of repetition on these processes and strategies, and the development of students' metacognitive awareness over the course of a semester. While we do not feel that we can generalize the findings from only four students to a wider population, we do argue that the longitudinal nature of this study, as well as the triangulation of research methods and data, enhance the value of this study. Transferability and relevance of this type of research cannot be the goal. However, findings from several studies along these lines will pave the way to enable an aggregate view of listening comprehension processes and strategies. Our findings on individual listening strategy and process use by proficiency level both support and conflict with past research findings, which is likely due to low number of students who are the focus of the present study. The in-depth nature of qualitative research serves as a stark reminder of just how individualized the process of comprehending aural input can be. Therefore, in order to confirm past findings and further enhance the generalizability of listening strategy research, we recommend future researchers either conduct research with a larger sample, conduct multisite or multiple case studies, or aggregate similar studies "to corroborate findings across studies" (Duff, 2006, p. 85). In addition, greater integration of notes and interviews in future studies is also necessary to gain insight into this complex phenomenon. Using a mixed methods approach with few subjects can provide researchers with a unique and comprehensive way to look at listeners' comprehension processes through a number of different lenses.

One of the most significant contributions of this research is looking at the impact repetition has on listening strategies and students' comprehension processes. With an abundance of digital audio being made available on the Internet, computer-based listening activities can easily include opportunities for repetition (Jones, 2006). Investigating the impact of this particular design feature on students' listening processes is becoming increasingly important in the area of computer-assisted language learning (CALL) as it can not only help

identify good opportunities for language learning (Chapelle, 2003), but also inform CALL design with regards to input enhancements (Sharwood-Smith, 1993). In addition, examining the strategies learners use while interacting with CALL listening materials employing the use of repetition can also allow researchers to gain insight into how this enhancement affects the comprehension processes in which learners engage. Understanding how students learn can help teachers design training materials and guide their students in working to increase their level of listening proficiency.

Another contribution of this research is using the MALQ (Vandergrift *et al.*, 2006) to assess students' metacognitive awareness development over the course of the semester. This measure provided us with insight into how students viewed their own learning and which strategies they perceived themselves using both at the beginning of the strategies course and at the end. While the MALQ provided a more quantitative measure, additional qualitative data such as interviews and notes allowed us to more fully understand students' responses on the MALQ. We recommend that future researchers using the MALQ to measure student development supplement it with additional qualitative measures.

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Appendix:**Listening comprehension strategies and definitions with examples^a***A. Metacognitive strategies*

-
1. *Planning*: Developing an awareness of what needs to be done to accomplish a listening task, developing an appropriate action plan and/or appropriate contingency plans to overcome difficulties that may interfere with successful completion of the task.
 - a. Advance organization
Clarifying the objectives of an anticipated listening task and/or proposing strategies for handling it. “Ok, I heard in the lecture, I find which is the main idea”
 - b. Selective attention
Deciding to attend to specific aspects of language input or situational details that assist in understanding and/or task completion. “I tried to find why he don’t want to give money.”
 - c. Self-management
Understanding the conditions that help one successfully accomplish listening tasks and arranging for the presence of those conditions. “Maybe if I listen to it again I can catch more information”
 2. *Monitoring*: Checking, verifying, or correcting one’s comprehension or performance in the course of a listening task.
 - a. Comprehension monitoring
Checking, verifying or correcting one’s understanding at the local level. “For this one, I can’t really interpret what the professor is talking”
 - b. Double-check monitoring
Checking, verifying or correcting one’s understanding across the task or during the second time through the oral text. “Ok, it’s some kind of earthquake, so I heard during the lecture it’s ‘quake’, it’s meaning of maybe is the word ‘earthquake’, so I understand what is the subject”^b
 3. *Evaluation*: Checking the outcomes of one’s listening comprehension against an internal measure of completeness and accuracy. “But I don’t know why she would want to gamble in Thailand.”
-

^aTable adapted from Vandergrift (1997, 2003).^bThis was the student’s second time through the listening passage.

4. *Problem identification*: Explicitly identifying the central point needing resolution in a task or identifying an aspect of the task that hinders its successful completion. “I don’t know if they are 8,000 students or contributors.”
-

B. Cognitive strategies

1. *Inferencing*: Using information within the text or conversational context to guess the meanings of unfamiliar language items associated with a listening task, or to fill in missing information. “He-the man ask the woman about budget of ... maybe this is a, maybe a medical health or money paid to help somebody’s who want to have their abilities to pay surgery fees.”
- a. Linguistic inferencing
Using known words in an utterance to guess meaning of unknown words. “He told him the store policy are reasonable. Reasonable or reasonable. I think they are suppose he doesn’t have reasons or maybe anyway.”
- b. Extralinguistic inferencing
Using background sounds and relationships between speakers in an oral text, material in the response sheet, or concrete situational referents to guess the meaning of unknown words. “He use the word is ‘horseradish’ but I don’t know what is the word, what is people laugh about it, so maybe it’s some joke.”
- c. Between-parts inferencing
Using information beyond the local sentential level to guess at meaning. “Uh, still I’m not sure what pickles is, so, um but the thinking process here is the same with the Pepsi.”^c

^cThe lecture the student was listening to was about research done with Diet Pepsi. After speaking about their findings with the Diet Pepsi, the speaker gave a similar example with pickles. Although this student does not understand the word ‘pickles’, he has noticed a commonality between the Diet Pepsi example and the pickles example.

2. *Elaboration*: Using prior knowledge from outside the text or conversational context and relating it to knowledge gained from the text or conversation in order to fill in missing information.
- “So, so I think he’s he used to date a girl who is a psychophysicist, and I think psychophysicist is someone who study relationship between management and how people feel.”
- a. Personal elaboration
Referring to prior experience personally. “I think that’s a really common issue in United States, cause I used to see a movie called, it’s about this kind of stuff, like parents want their, their child to move out and I can see why expression about this is called fail to launch. It describe the situation that your child live with you.”
- b. World elaboration
Using knowledge gained from experience in the world. “They thought they were close to this because there is a woman called, uh, Rice. There is a possibility that she become president if president dies and vice president dies. Rice a woman, who Bush’s government, I think.”
- c. Creative elaboration
Making up a storyline or adopting a clever perspective. “So he find out how to make, how to expression the design, so he thinks so. He talk about and he said ‘horseradish’, it’s maybe, it’s actually some design, so it’s very funny design, so many people laugh at it.”
3. *Summarization*: Making a mental or written summary of language and information presented in a listening task.
- “Uh, this guy talk about what he, what he had, has, has talked, has talked in the past of this causes, about the history of earthquake and, and reasons cause earthquakes sometimes.”
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4. *Repetition*: Repeating a chunk of language (a word or phrase) in the course of performing a listening task.
- “And another one talked about for 5 months ago a single, single, single, I don’t know what single.”
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