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Developing Listening Comprehension in ESL Students at the Intermediate Level by Reading Transcripts While Listening: A Cognitive Load Perspective

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A thesis submitted to the faculty of
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ABSTRACT

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Listening is one of the key skills needed to be proficient in a second language (L2). Some L2 teachers support the development of L2 learners' listening skills by providing input in a different sensory mode (e.g., reading). Nevertheless, developing L2 listening skills using more than one sensory mode, may lead to cognitive overload. In order to provide effective L2 listening instruction, teachers need to know what learning strategies will help students improve their listening skills. This quasi-experimental study examined the benefits of reading a text while listening to it and the effect that reading-while-listening (RWL) has on an L2 learner's listening comprehension. The study was done with intermediate-level, English as a Second Language (ESL) students in two pre-existing classes at the English Language Center (ELC) in Provo, Utah, with one class using a teaching method that included reading and listening together and one class that did no reading, just listening. The results of this study showed that both the control group and treatment group significantly improved their listening comprehension skills over the course of 14 weeks. For the treatment group which had used RWL, however, their listening scores were not significantly different from those of the control group. The pedagogical implications of the findings for second language teachers teaching listening skills are also discussed.

Keywords: ESL Listening strategies, listening pedagogy, reading-while-listening, cognitive load theory

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PREFACE

In accordance with TESOL MA program guidelines, this thesis was prepared as a manuscript to be submitted to the journal *System*. This journal was chosen because it is devoted to discovering answers to the problems of foreign language teaching and learning. The readers of this journal could use the information in this thesis to inform pedagogical strategies regarding the teaching and learning of listening skills or in the creation of curriculum. Researchers may also benefit from the list of suggested future studies.

Manuscripts that are submitted to the target journal should: (1) be prepared according to the *Publication Manual of the American Psychological Association* 6th Edition (2) have all identifying information removed to ensure an impartial review, (3) not exceed 7,000 words. This manuscript was prepared in APA format, but will need to have identifying information removed prior to submission. It will also need to be cut down to fewer than 7,000 words.

An alternative target journal is the *Modern Language Journal*. This journal's aim and scope is to publish research and provide a platform for the discussion of teaching and learning foreign languages. Article lengths for this journal are generally between 8,000 and 10,000 words. The *Modern Language Journal* would prefer submissions that are grounded in theoretical knowledge and have clearly stated implications for use by teachers.

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Introduction

In 1690, the famous philosopher John Locke wrote, “To make words serviceable to the end of communication, it is necessary that they excite in the hearer exactly the same idea they stand for in the mind of the speaker. Without this, men fill one another’s heads with noise and sounds; but convey not their thoughts and lay not their ideas before one another" (Locke, 1690, p. 350). Listening, in the sense of communication, is the act of understanding what another person is saying. Human beings can communicate through gestures or writing; however, spoken language makes communication more efficient and allows for more complicated and in-depth ideas to be exchanged.

In 1945, at the dawn of the audio-lingual era of foreign language teaching, C.C. Fries developed a model of learning English as a foreign language which he named the "oral approach," however, one of the goals of his model was not only "the building up of a set of habits for the oral production of a language,” but also “for the receptive understanding of the language when it is spoken" (Fries, 1945, p. 8). Henrichsen (1985) wrote about Fries' oral approach and how it related to listening comprehension. He noted that although Fries understood the importance of listening comprehension, he (Fries) "was never completely satisfied with the compromise which was affected between these basic but rival factors in his oral approach theory" (p. 356). Fries' goal of teaching "receptive understanding" has been pursued by many other researchers and teachers in the field of language pedagogy.

In 1975, J.O. Gary wrote about the advantages of delayed oral practice for teaching a

language and posited that focusing on listening before speaking would benefit listening comprehension. Gary (1978) made it clear that she was not talking about "the typical listening pedagogy of the day, passive listening, but 'active listening,' a process whereby the student is actively attempting to understand and respond effectively to oral communication carefully presented in a meaningful context" (Gary 1978, p. 185). Gary's study showed benefits to listening comprehension overall when allowing students to focus on listening before expecting them to speak, similar to how native speakers learn as children. Gary's study of "active listening" as opposed to passive listening came at a time when researchers were developing theories and models to advocate for the inclusion of listening as a skill in language pedagogy. In 1985, Henrichsen noted that there were a "flood of new texts designed specifically to develop students' listening comprehension skills" (Henrichsen, 1985, p. 343). A year later, Nagle and Saunders (1986) said that "While investigation of listening comprehension as a skill is just now [in 1986] coming into its own, concern with the role of listening in teaching is not new" (p. 20). Nagle et al. listed researchers who had laid the foundation for the inclusion of listening comprehension in second language pedagogy, including "Nida (1957), Asher, Kusudo, and de la Torre (1983), Postovsky (1974), and Winitz (1981), Belasco (1981), Stevick (1976, 1980), and Krashen and Terrell (1983)" (Nagle et al., 1986, p. 20). Vandergrift (1999) reinforced the importance of teaching listening skills. His article outlined pedagogical ideas for teaching second languages, including pre-listening, while listening, and post-listening strategies for teachers to use to help their students improve their listening skills. He stated that [listening comprehension] "plays an important role in the process of language learning/acquisition, facilitating the emergence of other language skills. For these reasons, an awareness and deployment of effective listening comprehension strategies can help students capitalize on the language input they are receiving"

(p. 170).

As recognition of the importance of teaching listening skills has increased, studies have been done to provide empirical evidence supporting the use of the pedagogical strategies mentioned by Vandergrift. For example, Chang & Read (2006) did a study to examine listening strategies such as providing background information, repetition of input, question preview, and vocabulary instruction. Other studies such as Ahmadi & Rozati (2017), Chou (2017), and Namaziandost, Neisi, Mahdavirad, & Nasri (2019) provide support for teachers concerning the strategies, particularly metacognition strategies, that will work for teaching listening skills to L2 learners.

As listening has found its way into the curriculum and teaching practices used by ESL educators, the difficulty of teaching and learning listening comprehension has also been acknowledged.

Listening is an essential skill for language learners, but it is very difficult to acquire. Why is listening so difficult for L2 learners, and how do we know that it is difficult? Because listening happens in real time, it is a difficult skill for a language learner to master. Fries (1945) noted that "it is not enough for the foreigner to be understood when he asks a question. He must be able to understand the 'flood of language that comes in answer to his question" (p. 33). Henrichsen (1985) agreed, saying that "another important difference between listening and all the other language skills--speaking, reading, and writing--is the amount of processing time available" (p. 354). Henrichsen points out that learners can do all other skills (reading, writing, speaking) at their own proficiency level, however, listening has to be done at the level of difficulty that the speaker uses. If the speaker is speaking quickly, using academic vocabulary, and/or idiomatic phrases or colloquialisms, for example, then the listener must attempt to process this as the

conversation is happening. Rost (1990) talks about how reading and listening both involve receiving input, however, reading is on paper and a language learner can look at it again and again, whereas listening happens in real time, hearing the utterance one time, which makes it very difficult for language learners to master (Rost, 1990). Danan (2016) wrote that "listening requires the ability to convert a stream of sounds into meaningful units of information in real time. All other language skills allow for time to think and correct while in the process" (Danan, 2016, p. 2).

In addition to the real-time nature of listening and the problems this can create for learners, other aspects of listening also contribute to difficulty in processing speech. Language learners may have difficulty with familiarity of the topic, chunking of language, reduced forms, performance variables such as hesitations, volume, and pausing, colloquial language, rate of delivery, interpreting intonation contours as well as word and sentence stress (Brown & Lee, 2015). Kim, Stephens, & Pitt (2012) concluded that "Spoken language is often a continuous stream of speech. For comprehension to succeed, the listener must segment this stream into a sequence of individual words" (p. 509). Again, comparing reading to listening as a receptive skill, the written text provides spaces between word boundaries, but spoken language does not. The listener must ascertain word boundaries while listening. Typically, a speaker does not pronounce each word separately and distinctly, especially if the speaker is speaking quickly. Listeners must figure out where the word boundaries fall, which is not easy. Goh (2000) found that many L2 listeners have difficulty segmenting meaningful units from the stream of words they hear. Huljstin (2003) acknowledged that learners "must acquire complex skills to segment speech into words" and also says that "speech segmentation hardly lends itself to conscious monitoring and needs to be acquired by extensive practice." (p. 419).

Not only is listening difficult to learn, it is also difficult to teach. Many teaching strategies include a listening passage followed by comprehension questions to see if the students understood the listening passage, which is more like an assessment of listening skill than a teaching strategy. These assessments can be useful; however, the assessments themselves are often dependent on students' abilities in other skills, such as reading and writing. Vandergrift and Goh (2012) point out that these assessments are often used in the classroom disguised as teaching strategies. Speaking about the challenges of teaching listening, they summarize that although listening has slowly become more important in the language curriculum, "the time has come for language educators to rethink how they teach listening" (p. 13).

Because listening is such a difficult part of learning and teaching a language, it is important that teachers and students know which learning activities and strategies will provide the most benefit. Although listening has finally found an instructional place in the language classroom, there are not a lot of quantitative studies that address the effectiveness of the strategies used to teach L2 listening. The study reported here endeavors to aid teachers in choosing which strategies to use to teach L2 listening. More specifically, it focused on the listening skill-development strategy of reading while listening.

Reading-While-Listening (RWL)

A common strategy used for teaching listening skills is reading-while-listening (RWL). RWL has been shown to help students overcome some of the aforementioned challenges presented by listening. Chang (2011) noted in her study on RWL with audiobooks with high-school students in Taiwan that reading (while listening) helps language learners with word boundaries and auditory discrimination, and to "get used to the spoken rate, rhythm, and the natural flow of the language, and understand how to chunk texts" (p. 46). There are different

ways to read while listening, the two most prominent being reading captions in the learners' L1 or L2 while watching and listening to a video or reading a transcript of a passage while listening to it. "When using RWL, listening is the focus, so spoken texts, e.g., conversations, stories, lectures, and movies, are used to assist listening comprehension" (Chang, 2011, p. 46). The strategy of reading captions while listening is a commonly used and is generally an easy-to-access strategy used often in a classroom setting and also by students individually. Many language learners have access to online videos that have captions available and they use these captions to help aid in their comprehension of what they hear. Because captions are a widely used strategy for scaffolding listening comprehension, the author chose to focus the present study on reading a transcript while listening to a passage of the same text (RWL). From this point on in this study, RWL will refer to reading-while-listening to a transcript. Using a transcript when reading-while-listening is a technique sometimes used in classrooms as a teaching strategy, and it is easier to control in an experimental setting.

As will be shown in the review of literature in this article, a common consideration in the research of RWL is cognitive load. Most of the studies found on RWL at least mention cognitive load because RWL requires students to use two different skills, reading and listening together, which has the potential to increase students' cognitive load. Because of this, it seems appropriate to discuss the Cognitive Load Theory and its ramifications for RWL.

Cognitive Load Theory

Gary (1978) said that "requiring learners to produce material they have not yet stored in their memory will lead to language interference and overload of short-term memory" (p. 190), essentially cognitive overload. Later, Vandergrift (1999) said, "Insisting that learners produce what is not yet assimilated in long-term memory (LTM) leads to cognitive overload" (p. 169).

An advanced reader can normally recognize and process words automatically. "In contrast, children, in initial stages of learning to read, pay so much attention to reading individual words that they have no attention capacity left for the meaning of what they read; when reading the fourth word of a sentence they may have already forgotten the first word" (Hulstijn, 2003, p. 419). This concept also applies to L2 language learners. To become fluent, a learner must be able to automatically process words at the word recognition and parsing level in order to be able to concentrate on content and semantics (Harrington, 2001; Rost, 2002).

The Cognitive Load Theory hypothesizes that the cognitive load produced by some educational activities can create problems for effective learning. Our mind can only handle so much stimulation and information at a time, and then it shuts down. When learners are given too much information, tasks that are beyond their ability, or too many different types of learning tasks, comprehension can break down and the learners will not be able to move forward. By understanding the principles behind the cognitive load theory, educators can optimize the way they present ideas and information to students to make tasks more effective for learning. (Psychologist World, 2020)

Intrinsic cognitive load is the difficulty inherent in an educational task, for example, $4x + 3y = 25$ is inherently more difficult than $2 + 2 = 4$ because the equations require different levels of processing. In order to teach a student how to add $2 + 2$ and arrive at 4, a teacher can explain in one simple step using their fingers to show how the numbers can be added to provide the sum. However, in order to teach $4x + 3y = 25$, a teacher would need to break this formula into several lessons due to the solution requiring an understanding of how to process variables and fractions. Likewise, some tasks that are used for teaching a language may be inherently more difficult than others. The problem may come when a teacher doesn't realize the complexity of a listening task,

which is why it is important when teaching listening comprehension to understand the difficulty of listening sub-skills when learning a new language (Psychologist World, 2020) Paas, Renkl, & Sweller (2003) discussed the Cognitive Load Theory as “a 'major theory' that has provided a framework for generating instructional designs and procedures” (p. 1), which has motivated educators to find ways to instruct students without overloading them with input.

Because RWL activities include reading and listening at the same time, they could be considered to have intrinsic cognitive load, and so it is important to consider the effect that may have on students. Renkl and Atkinson (2003) did a study on teaching geometry from a cognitive load perspective. Their study showed that if there is substantial intrinsic cognitive load from the learning material itself, "learning is likely to be minimal” (Renkl & Atkinson, 2003, p. 17). They also found that what can be considered cognitive load depends on the learner's “specific stage of skill acquisition,” meaning that at more advanced stages of skill acquisition, it becomes easier for students to manage intrinsic or extrinsic cognitive load that may have been a problem in earlier skill stages (p. 19). Importantly, "cognitive load effects that are relevant at the beginning of a longer educational program are no longer relevant in later stages of the program, after the learners acquired sufficient expertise" (Renkl & Atkinson, 2003, p. 17), and “the nature of cognitive load changes from the intermediate to the late stage of skill acquisition” (p. 16). It follows then, that when considering the Cognitive Load Theory in the realm of learning to listen in a new language, the L2 proficiency level of the students should be a consideration for whether or not reading a transcript while listening will help students with comprehension. In other words, the cognitive load is affected by the level of the student, as well as by the cognitive load intrinsic to a given activity.

In order to evaluate the benefits of RWL for increasing listening comprehension for L2

learners, it is important to look at what has already been discovered about RWL and its pedagogical benefits. Now that the skill of listening has been given its due recognition in the field of second language learning, it is necessary to move forward with empirical studies that can help educators know the best ways to teach listening.

Review of Literature

This section will look at some of the studies that have already been done on RWL. The methodology of these studies will be given along with a summary of the results that were found. The existing literature about RWL for teaching listening skills to language learners reveals inconsistent findings. Numerous studies show benefit from RWL (Chang, 2009; Chang 2011; Brown, Waring, & Donkaewbua, 2008; Danan, 2016) while others challenge these conclusions. Chang (2009) conducted a one-day study with college students studying English in Taiwan who had been studying with the researcher for two years. No explicit level tests were given to the participants; however, they were felt to be within the A2 to B1 level on the CEFR scale, which translates to intermediate-mid to intermediate-high on the ACTFL scale. The students listened to and read short stories, and the gains were found in the comprehension of those particular stories, not necessarily their overall listening comprehension. Chang (2009) concluded that "students gained 10% more (comprehension) with the RWL mode than with listening only". Her study also gathered qualitative comments from the learners. She found that the students enjoyed the stories more when they were able to read while listening. Chang (2009) suggested doing further research of the benefits of RWL for students when using RWL over a longer period of time. Chang (2011) then conducted a 26-week study with 19 students in a high school in Taiwan. The ACTFL level of the students was not ascertained, but the students had all studied English for three years and had similar pre-test scores for the listening comprehension and fluency test

administered for the study. The structure of her study included a control group that was part of a typical formal classroom setting for learning listening skills, while the treatment group spent the same amount of time listening and reading in a classroom without a teacher overseeing their work. They were given a library of books with recordings and allowed to listen to them on their own classroom timeline. The study showed small gains for the treatment group when compared to the control group in the multiple choice listening comprehension part of the post tests and significant gains compared to the control group in the dictation part of the post tests. Chang attributed this last result to the treatment group being allowed a much longer time for listening.

Brown, Waring, and Donkaewbua's 2008 study had similar results to Chang's studies and showed that not only did students score higher using RWL, but their qualitative survey found that students felt more comfortable in the reading-while-listening mode (Brown et al., 2008). The participants in this study were 35 Japanese EFL students from a university in Japan who had studied English for 6-7 years. The study included a reading-while-listening treatment during three 90-minute classes done at 2-week intervals. Brown's study assessed vocabulary acquisition and not necessarily listening comprehension, and the study found that reading only and reading while listening had similar outcomes, both of which helped students acquire almost 50% of the vocabulary tested. The listening-only group scored only 30% on the same vocabulary test. The qualitative data from this study showed that students enjoyed the reading-while-listening activities more than the listening-only, which could help with motivation and concentration. It should be noted that these students were not assigned a proficiency level, however they had studied English for 6 years as compared to 3 years in the Chang (2011) study, so these students could possibly have been at a more advanced level than the participants in Chang's (2011) study.

Danan (2016) did a study with 15 participants from a California military school who were

studying French in a six-month long intensive language program. The students took a practice Defense Language Proficiency test at week 17 and were found to be at varying proficiency levels ranging from 1+ (Elementary Proficiency) to 3 (General Professional Proficiency). These levels could be translated to Intermediate high (1+) to Superior (3) on the ACTFL scale (Interagency Language Roundtable, 2020). The treatment in her study happened once a week during a regular class for four weeks. The students watched a video on week one with no RWL or captions and then watched the same video the following week with RWL or captions. The same procedure was repeated in weeks three and four with a different movie. Her study was meant to observe the differences between RWL using transcripts and RWL using captions. Her study showed that overall, students showed significant gains from RWL, however, the lower proficiency students had some benefit from captions, but very little benefit from transcripts. Her study also found some interesting data pertaining to a case study that was part of her larger study. The case study looked at the lowest-level participant and found that this student had lower scores when using RWL (Danan, 2016).

Along the lines of this case study done by Danan, and in contrast to the aforementioned studies that showed gains from RWL, two other studies in particular have shown that RWL has a negative effect on listening comprehension. Both of these studies approached RWL with a focus on the cognitive load that is created by RWL. The first study done by Diao, Chandler, and Sweller (2007) was conducted at the Tianjan Foreign Language Studies Institute in China. It attempted to discover if using verbatim visual text accompanying listening material would be beneficial, incidental, or redundant for increasing overall listening comprehension. The study consisted of three formats, listening-only, listening with a script, and listening with subtitles. The participants of the study were 159 students from China who were native Chinese speakers who

had studied English in an EFL setting for six years in high school and one year at a university. No formal assessment of their level was given, but they had all followed the same curriculum at the aforementioned institute and were considered to be at the same level. Participants were randomly assigned to one of the three groups based on format, and a computer-generated test that lasted between 60 and 90 minutes. The study found that students that had the benefit of a script or subtitles had significantly higher scores on the listening comprehension questions for those passages. However, the study was extended and administered a week later and there was no increase for subsequent listening passages with no script or subtitles for either group. The authors point out that the results "suggest that the addition of written representations in the form of a full script or subtitles to an auditory passage, though assisting in comprehension of the passage, did not assist in the construction of relevant schemas for dealing with listening comprehension tasks" (Diao et al., 2007, p 250), or in other words, the study could not show whether RWL helped with overall listening comprehension.

Moussa-Inaty, Ayres, and Sweller (2012) actually found that students had lower listening comprehension when reading-while-listening. Their study focused on assessing cognitive load in a study investigating whether listening skills in English as a foreign language classroom could be improved by reading rather than listening only. The study compared the effect of reading-only learning activities with that of listening-only learning activities on listening comprehension, and then compared the results of these tasks with students using reading-while-listening learning activities. The study by Mousa-Inaty et al. included three experiments over a three-day period at a university in North Lebanon with Arabic-speaking students who had previously studied English in middle and high school. The results of these experiments showed that reading-only gave the best results on listening comprehension tests, followed by listening-only. Reading-

while-listening produced the lowest scores. These results suggest that teachers should use reading-only to teach listening skills. Although the results were significant, the authors admit there were limitations to their study--such as the students' first language (non-IndoEuropean), the length of the study, and the level of the students, which could affect the applicability of these results to the overall strategies used to teach students listening skills. First of all, the students in this study were Arabic speakers who had to learn a completely new alphabet when they studied English, which could have had an effect on their reading ability. However, their reading ability may still have been more mature than their listening ability because the participants were English as a Foreign Language (EFL) students from the Middle East. EFL students do not usually have the advantage of practicing English with native speakers and may struggle with listening. As a general rule, EFL students speak English in class, but when they leave class, most of their communication is in their L1. Thus, students in a foreign language environment don't have nearly as much input as ESL students do because their native language dominates their daily communication (Chang, 2009). One other important limitation of their study that Moussa-Inaty et. al. acknowledged is that the proficiency level of the participants in the study was not assessed explicitly, it was only noted that the participants had all studied English in intermediate and high school in their country, and so they were not able to compare the results to account for the proficiency level of the students. (and as previously noted by Renkl and Atkinson (2003) and Danan (2016), the level of the student plays an important role in understanding the effects of cognitive load.)

While the Mousa-Inaty, et al. study had some limitations, the effects of cognitive load should not be abandoned when researching the benefits of RWL for listening comprehension. In fact, a study by Roussel, Gruson, and Galan (2019) concluded that "the 'cognitive load theory'

provides relevant explanations as to why less-skilled listeners often over-rely on either low-level or high-level listening processes, since combining both is costly" (Roussel et al., 2019, p. 41). The study was done in a French high school with 108 students ages 15-16. The intent of their study was to find if students' listening comprehension benefited more from training in high-level or low-level processes. High-level processes include prediction, inference, utilization of background knowledge, and contextual skills. The high-level processes used in this study were planning and predicting, verification of hypotheses, group discussion, and further verification. Low-level processes include phoneme recognition and parsing to find meaningful words. The low-level processes used in this study were counting words and sentences, categorizing words (verb, adj, noun), and filling in the blanks of a script. The participants were given a pretest and two groups were created. The groups had similar overall average scores on the pretest. One group participated in three training sessions in low-level processes, one per week for three weeks. The other group did the same, but with training using high-level processes. The post-test results obtained at the conclusion of the study did not show significant differences in comprehension for either group. However, on further analysis of the data they did find significant gains for the students with lower scores on the pretests in the group that had training in low-level processes. They noted that "it appears from our findings that alleviating the cognitive load by training low-level processes is efficient for less-skilled listeners" (Roussel et al., 2019, p. 49).

The argument that lower-level students will struggle with the effects of cognitive load on listening comprehension is also supported by Hulstijn (2003), who says that listening is a complex activity, "yet we are capable of doing several things at the same time, provided that most of these things take place automatically, not demanding conscious control" (p. 419). Danan

(2016) also agrees with this argument, saying that the less effort learners spend on low-level tasks, the more learning capacity is available for meaning and content, e.g. comprehension. These findings may explain why lower proficiency students are not be able to handle the cognitive load of RWL as a learning activity for listening comprehension. If the proficiency level of the student plays a part in the gains for listening comprehension from RWL, that knowledge should inform teaching and curriculum development for ESL students.

The author, while working at Brigham Young University's English Language Center became aware of some action research that had been conducted by a program instructor with two advanced-low listening and speaking ESL classes. Her quasi-experimental study included a control group that had 16 students and a treatment group that had 15 students. This unpublished study was done over a 12-week period with the teaching intervention consisting of students listening to a TED talk along with reading the transcript of the talk. This process was used two times a week in the treatment group while the control group listened to the same listening passage but with no transcript. The unpublished results of the study showed that students who were given transcripts while they listened achieved significantly higher listening comprehension scores on the post tests when compared to students who only listened without access to the transcripts. This action research was different than the previous studies in that it was done over a 12-week time period rather than for just a few days or a limited treatment period. This study also accounted for the proficiency level of the students. This action research inspired the present study, as the methodology of this study answered two of the limitations noted by many of the previous studies, the length of the study and measurement of the level of the students in a way that make the results of the study more easily generalizable for future research and application to teaching and curriculum development.

Research Question

The foregoing discussion leads to the question--if the proficiency level of the learners has a bearing on their ability to handle cognitive load, and students do benefit from reading a transcript while listening, to what degree does reading-while-listening as a tool for teaching listening skills to ESL learners benefit the overall listening comprehension of intermediate-level students? The results from this study will contribute to our understanding of how to use RWL, more specifically, if the pedagogical strategy of reading-while-listening (RWL) is an effective way of improving the listening skills of intermediate-level students.

Method

This section will set forth the participants, the instruments, procedures, and analysis used in this study.

Participants

The participants in this quasi-experimental study were enrolled in two pre-existing intermediate-level ESL classes at Brigham Young University's English Language Center (ELC) in Provo, Utah. There were 18 students in each class. At the beginning of the semester, students had been randomly placed in one of the two classes. One class served as the control group and the other class served as the treatment group. These students ranged in age from 18-40. The average age in the treatment class was 21 and the average age in the control class was 23. The gender of the students was 10 females and 7 males in the treatment class and 9 females and 8 males in the control class. The participants were international students from many different countries who had all scored similarly on placement tests that they took upon entering the ELC. Nearly half of the students in both classes spoke Spanish as a native language, followed by Japanese and Portuguese speakers, and 1 or 2 students in each class spoke Korean, Arabic, and

French as their native language. The participants were intermediate high on the ACTFL scale and could understand information in simple speech on familiar topics. They were able to comprehend information in a "controlled listening environment where they hear what they may expect to hear," depending largely on context and high-frequency vocabulary (ACTFL Proficiency Guidelines, 2012).

Instruments

The test used in this study was the ELC's Computer-Adaptive Placement (CAPE) test. This CAPE test is a multiple-choice computer-adaptive test that was authored and validated by faculty at Brigham Young University (BYU) in the late 1990s. The CAPE is designed to measure students' current language ability based on the ACTFL scale and then place them in the correct level or course. The development of the CAPE required significant research to calibrate and determine the difficulty of each question. The CAPE has evolved to now being administered online. The English Language CAPE test has three sections; listening, reading, and writing, and the CAPE has been calibrated with the ACTFL proficiency guidelines (ACTFL, 2012). The CAPE test is used widely across the nation for placement for L2 language learners. The same CAPE test used at the ELC is now "run by Perpetual Technology Group (PTG), which has turned it into a web-based exam, called 'webCAPE'. PTG is the exclusive licensee of Brigham Young University's webCAPE. PTG has been offering webCAPE since 2004 and now has over 200 institutionalized clients globally" (Perpetual Technology Group, 2020). The listening section of the CAPE test was used as the pretest at the beginning of the study and then as the post test at the conclusion of the study.

Procedure

The lead author of this research was the instructor for the two intermediate-level classes

used in this study. The treatment class met at 9:30 AM and the control class met at 12:15 PM. Both classes were presented with two listening passages each week.

The listening passages used (see appendix) were taken from the course textbook, *Prism Listening and Speaking*, level 2 published by Cambridge University Press in 2017 (Lansford et. a., 2017). In order to maintain the validity of this study, the passages were unavailable in the online part of the course so that the students could not listen to them on their own. The passages from the book were read by 3-4 different actors, using both male and female voices. The authenticity of the listening passages could be considered a limitation of the study when using the authenticity standards set forth by Gilmore (2007), who found that the most workable method for determining authenticity was the 'real' method, "the language produced by a real speaker/writer for a real audience, conveying a real message" (p. 98). In order to maintain consistency between the two classes, passages from this textbook were used even though they lacked authenticity. The passages were on the topics that were talked about in class and were usually about common issues of the day such as the environment or technology.

Each passage took approximately 10-15 minutes of class time to complete. The instructional procedure varied by group (See Table 1). The control class listened to the passage three times with short discussions between each listening. The treatment class listened to the passage once, had a short discussion about the material, and then listened a second time while reading a copy of the transcript that was handed out at that point. Before listening a third time, the students were instructed to turn over the paper and listen a third time for any words that they may not understand. After the teacher answered any student questions after the third listening, class resumed. There were times that the content of the passage was a topic that students wanted to talk about, and that interest may have led to them spend more time on some of the passages,

but generally the same amount of time was taken in each class. Similar questions came up in both classes, although the class with the transcript seemed to focus in on more specific vocabulary words with which they were unfamiliar.

Table 1

Intervention Conditions for Control and Treatment Groups

	Control Group	*Treatment Group*
Step 1	Listen to the conversation	Listen to the conversation
Step 2	Listen again	Listen again + read transcript
Step 3	Class discussion	Class discussion
Step 4	Listen again + focus on comprehension	Listen again with no transcript

One of the possible problems that should be noted with the implementation of the approach was that the sound from the video projectors used in both classes was not high quality and at times had static or was difficult to hear. However, both the control group and the treatment group used the same projector, so the effect of the audio quality was the same for both groups.

Data Analysis

In order to answer the research question asked in this study, what effect does the teaching strategy of reading-while-listening have on overall listening comprehension for intermediate-level ESL students, the results of the pre and post CAPE tests for the participants were analyzed. These scores were analyzed using Jamovi software (2020), a well-known and trusted software program that provides statistical analyses such as t-tests and ANOVAs. Before looking at the results in detail, it is important to note that only 17 students from each section took the final

CAPE; one student from each class did not complete the study, and data from those participants were removed from the study. The data was analyzed using a repeated measures ANOVA, which included the within-subjects effects and the between-subjects effects. The eta-squared values were determined as well in order to address the possibility of the small size of this study giving an inaccurate *p* value.

Results

The descriptive statistics (See Table 2) showed that over a 14-week semester the students in the control group had a 4.5% increase in overall listening comprehension and the students in the treatment group had a 7.5% increase in overall listening comprehension. Both classes had increases in listening comprehension over the 14-week semester, as shown in Table 3. The data showed a significant difference [F (1, 32) = 20.12, p <.001] for all participants when comparing the pretest and post-test scores. The procedure was used for 12 weeks over a 14-week semester in an intensive English program, so significant gains from studying English in a full-time setting are to be expected regardless of any specific strategy used by teachers. The data that will answer the research question of whether intermediate-level students showed significant gains in overall listening comprehension from RWL is the difference between the gains in the control group and the treatment group. The data in Table 4 show that there is no significant difference between the control and treatment groups [F (1, 32) = 2.86, p = 0.101], or no interaction effect between the control and treatment groups. The p value is over 0.05, which indicates that there was no significant difference between the two classes. The students who used RWL increased their listening comprehension post-test scores by 3% more than those who listened-only to the same passages, however this gain is not considered significant.

Table 2

Pre and Post-test Descriptive Statistics

	Group	CAPE Pre-test	CAPE Post-test
N	control	17	17
	treatment	17	17
Missing	control	0	0
	treatment	0	0
Mean	control	634	666
	treatment	654	708
Median	control	641	672
	treatment	651	693
Standard deviation	control	55.4	54.7
	treatment	70.2	58.0

Table 3

Proficiency Gains for all Participants

	Sum of Squares	df	Mean Square	F	*p*	η^2_p
Listening Test Score	30962	1	30962	20.12	< .001	0.386
Listening Test Score ✻ Group	2271	1	2271	1.48	0.233	0.044

Residual	49237	32	1539		

Note. Type 3 Sums of Squares

The *p* value of 0.101 in Table 4 showed that there was no statistical significance between the treatment group and the control group. However, because the population sizes for the two groups of participants were relatively small, it is difficult to use the *p* value as an accurate measure of significance. This study, therefore, also took into account the partial eta-squared (η^2_p), which shows the amount of possible variance between the *p* values if this study were repeated. The partial eta-squared amount of 0.082 is considered a small effect size, which shows very little interaction effect between the class that experienced reading-while-listening and the class that did listening only.

Table 4

Proficiency Gains Between Groups

	SS	**df**	**MS**	**F**	**p**	**η^2_p**
Group	16121	1	16121	2.86	0.101	0.082
Residual	180677	32	5646			

Note. Type 3 Sums of Squares

When comparing the box and whisker charts for the pre (Figure 1) and post-tests (Figure 2), we see that for the pretest the box and whisker charts were similar in position, with the median being close with no outliers for the treatment group and only two outliers for the control group. In contrast, for the posttest (Figure 2), the treatment group had almost an identical spread

of the scores as it did for the pre-test with all scores being raised nearly 100 points higher. The posttest graph for the control class had four outliers at the top of the graph and two at the bottom of the graph. This shows that one third of the data points were outside of two standard deviations from the mean and shows that there was a lot of variation in the data points. It is also interesting to note that the minimum and maximum scores did not change much for the control group.

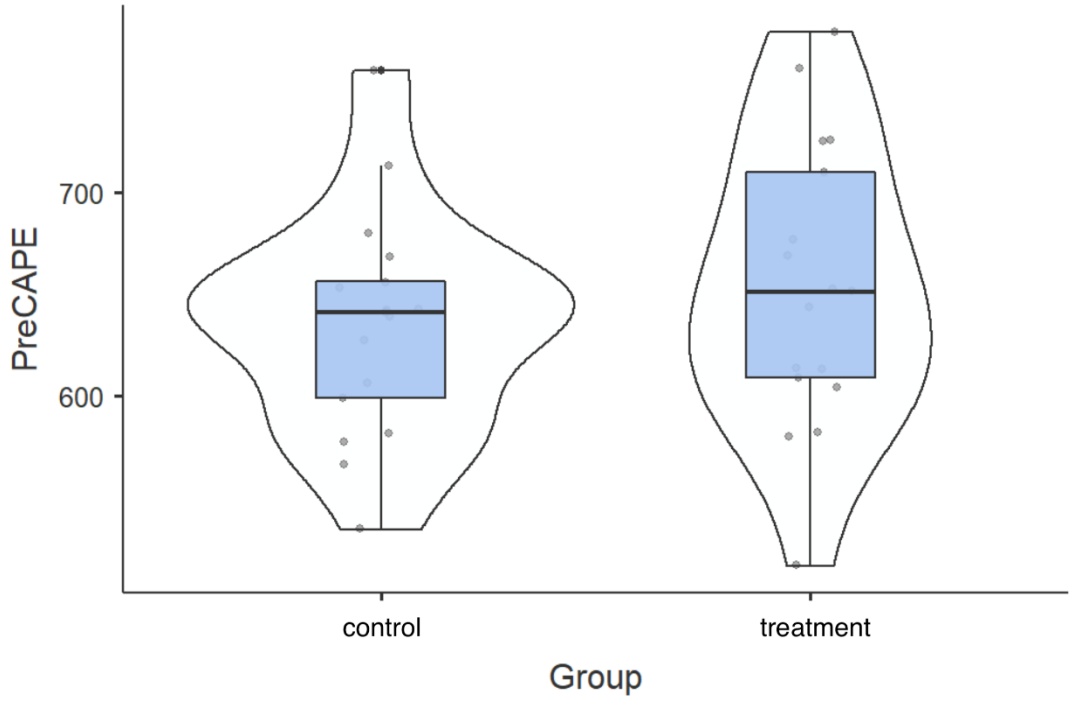

Figure 1. *CAPE Pre-test*

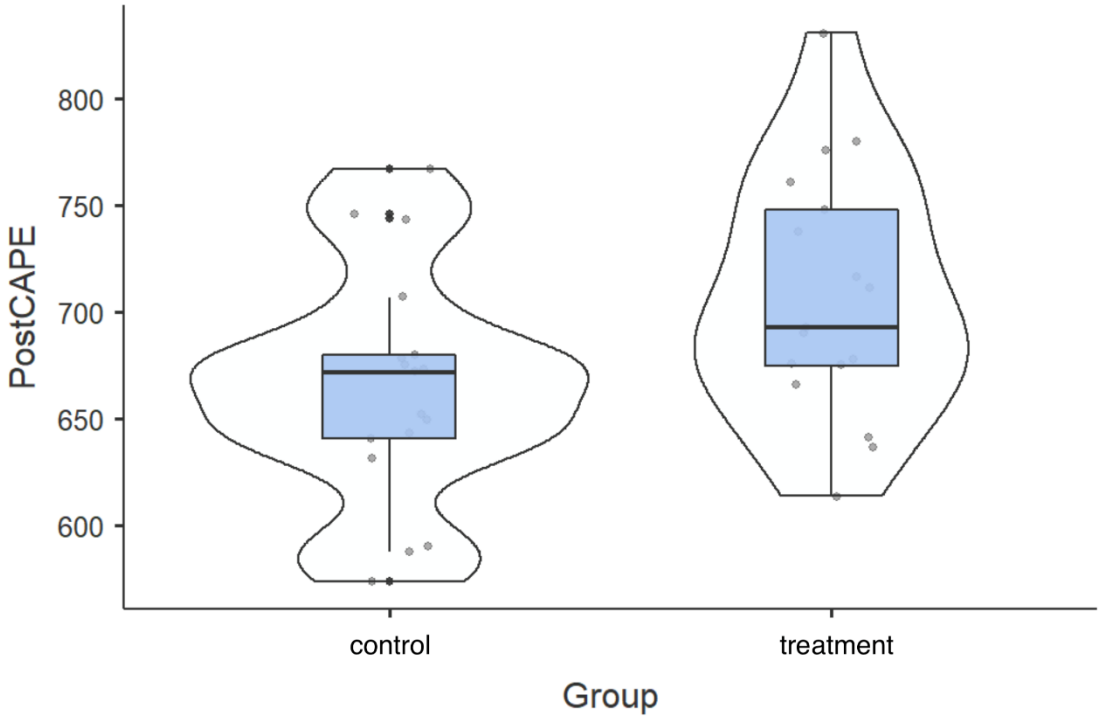

Figure 2. *CAPE Post-test*

In summary, the statistical analysis done for the data obtained in this study shows that both groups had a significant gain in listening comprehension from the pre-test to the post-test over the semester. The treatment group did have a higher gain than the control group, however, there is no statistical significance between the control group and the treatment group's scores.

Discussion

The purpose of this study was to determine (using empirical evidence) the usefulness of RWL as a pedagogical strategy for teaching listening to second language ESL learners at the intermediate level, in particular for helping students with overall listening comprehension. The data from this study did show a 3% gain for the treatment group, however the statistical analysis does not show the gain to be statistically significant. The possibility of the effects of cognitive

load resulting from the teaching strategy of RWL has been examined and could be a possible reason that RWL does not give statistically significant gains for intermediate-level students. It has been noted in other research that more advanced learners appear to be able to handle high level and low-level processes at the same time, and also are able to handle more than one type of input at the same time, therefore taking advantage of the benefits of RWL such as word clarification and lessening the real-time effects of listening by providing a transcript for reference. Intermediate-level students may not have the ability to handle the low-level processes of listening with enough automaticity to be able to focus on comprehension and do not benefit as much from reading while listening.

The data found in the previously mentioned action research study that inspired this study has not yet been published, however, if advanced-level students do show significant gains from RWL, then that would be more concrete evidence that the cognitive load created by RWL makes RWL a less effective teaching activity for lower level students. Many, if not all, of the literature presented here surrounding the teaching strategy of RWL refers to the cognitive load created by RWL. These same studies, except for the Moussa-Inaty, et al. (2012) study, also touch on the differences in gains depending on the level of the L2 learner.

It should also be pointed out that the gains described in the studies in the review of literature were gains in the comprehension on one specific listening activity over a short period of time. For example, Chang (2009) was a 1-day study, Brown et. al. (2008) was a 1-day study, Diao et. al. (2009) was a 1-day study (with further testing), Mousa-Inaty et. al. (2012) was a 3-day study, and the Danan study (2016) was one treatment per week for 4 weeks. The Chang (2011) study took place over a semester, however, the control and treatment groups were very different, which may have introduced conflicting variables into the findings.

With studies done over a short period, such as one or two activities, it is difficult to know if the gains in comprehension came from reading or from listening, or if RWL helps with overall listening comprehension. Participants in Diao et. al. (2007) did show short-term gains for some students, meaning for one activity using RWL, however, when the authors extended their study to look at consecutive studies where the students were not given transcripts, their results did not show the same gains for listening comprehension. This was reinforced by the results of the Moussa-Inaty, et al. study where their study also included data from reading only and discovered that reading only showed greater gains in listening comprehension than RWL. Other than the Chang (2011) study, there were no studies found that attempted to find the benefits to overall listening comprehension from using RWL over an extended period of time. The current study helps to fill the gaps in previous studies and the call for further research over a longer period time found in the existing studies done using RWL. In order to provide empirical evidence that RWL helps with listening comprehension overall, this study focused on a semester-long course using RWL as part of the pedagogical strategies.

As noted in many of the previous studies referenced in the review of literature, the question of proficiency level was also either taken into consideration as part of the study or the study inadvertently found that there was a correlation between realized gains and the proficiency level of the student. The proficiency level of the participants in most of the studies was not explicitly determined, which makes it difficult to generalize the findings of these studies with regards to the proficiency level. The Danan (2016) study, the Diao et. al.(2007), and the Chang (2009) studies all shared similar findings, concluding that there was a difference in the benefits from RWL for different proficiency levels of language learners. Danan (2016) showed that most of the participants in her study benefited when they used RWL over a 4-week time period. The

study showed that the more advanced students benefited greatly from transcripts, but lower-level participants didn't have the same benefit, and one lower-level student in particular achieved lower scores in overall listening comprehension when using RWL. In Diao et. al. (2007), lower-level students did not benefit from RWL. Chang (2009) showed that RWL for lower-level students actually resulted in a lower score in the sequencing comprehension tests using RWL as compared with the higher-level students. Chang (2009) said that "reading-while-listening should be seen as listening support through written texts, especially for lower level listeners where the main purpose is to help them confirm what they hear" (p. 654). Chang posited that "lower level students' reading skills might not be as good as those of higher level ones, hence their global comprehension was not particularly enhanced by reading the script" (p. 661). Moussa-Inaty et. al. (2012) acknowledged that one of the limitations of their study was that there was no explicit level ascertained for the participants, and therefore it was difficult to generalize the results for practical use.

The present study took into account the proficiency level of the participants in a way that could show that RWL may have different effects for students with different proficiency levels. Many of the studies provided the length of time that their participants had studied English, but no definitive way of assessing their level of proficiency. The Danan (2016) study did have a level assessment done, however, the participants in that study were at all different proficiency levels. The present study did assess the level of the students, however, future studies are needed in order to compare the results between levels to try to ascertain if RWL may cause unnecessary cognitive load that creates redundancy for lower-level L2 language learners. Moussa-Inaty et. al. (2012) brought up an interesting question of the possibility of the cognitive load of RWL actually contributing to beginning-level students doing more poorly with listening

comprehension than if they had listening-only, which could be an interesting question for further study.

As shown by previous studies done on RWL, there is benefit for comprehension for single listening activities for L2 learners. RWL has also been shown to help with motivation and concentration with listening activities, and therefore could be considered an effective teaching strategy for teaching listening. The present study showed small gains of 3% in overall listening comprehension for students who use the RWL listening strategy, however, this gain is not considered statistically significant. Further studies could be done to support this study and also show at what proficiency levels RWL will have the most benefit for L2 learners.

Limitations

Some of the limitations of this study have already been introduced, for example, the authenticity of the listening passages and the quality of the projector that was used to administer the listening. Both of these limitations were present in both groups, which mitigates the possible negative effect of these issues on the study results. However, although the level or the authenticity of these listening passages may be in question, these passages were chosen because they were from a published curriculum (Cambridge), which makes these listening passages more representative of the possible listening passages used by teachers around the world. The number of participants in the study was addressed in the results section when talking about the *p* value, and this limitation was mitigated as much as possible with the partial eta squared value in order to account for the possible variation in *p*-values due to the size of the groups. The participant numbers in studies in the field of language learning are often limited because classroom research takes place in existing classes which are usually limited by the size of the classroom, however, further studies of this kind could provide evidence to support these findings. Another possible

limitation is the type of test used for the pre and post-tests as it was not specific to the treatment used in the study and the CAPE test is generally considered a placement test, however, the intent of this study was to look at the overall listening comprehension gains, and so this test was chosen because it was already built into the experience of these students, and it gave an initial score used in a real-life placement situation, as well as a post-test score obtained using the same format. Another limitation could be the amount of time spent each week in the classroom on RWL activities. This study provided for two activities (about 30-40 minutes) a week on RWL activities, and maybe doing more than that per week would make a difference in the overall gains.

Implications for Future Research

One idea for future research has already been presented, which would be to do the same type of study with beginning and/or advanced-level students to examine the effect of RWL on other levels. Another idea for future research would be to study the effect of using listening passages at slightly lower proficiency level than the actual level of the students' other language skills to make up for the difficulty of listening compared to other language skills. Another possible study may be to investigate further the value of reading-only to assist in listening comprehension, as pointed out by the Moussa-Inaty (2012) study. Another interesting study that could be conducted using this model would be to take into account the writing system of the students' native language. When a language learner has to learn a whole new alphabet, that could be a factor in how well RWL will help that student. Such a study may help us know if reading-while-listening helps students from Asia, for example, more or less than students with native languages that are Latin based. It would also be interesting to do a study on using RWL as homework assignments. And finally, possible future research should include collecting

qualitative data that asks questions of the participants to find out what they are thinking as they participate in RWL activities and to further explore the possible effects of cognitive load when using RWL.

Implications for Practitioners

This study is an empirical study; however, it is also a synthesis of the literature available on the subject of RWL. This study does show small gains in overall listening comprehension for intermediate-level students using RWL as a strategy for learning. Previous studies such as Chang (2009), Diao et. Al. (2008), and Danan (2016) showed significant gains for students on a per-activity basis. These studies demonstrated the usefulness of reading-while-listening for providing support for language learners on a per-activity basis, which in turn gave motivation and enjoyment while learning, and therefore aided their concentration. For these reasons, RWL should be considered a beneficial activity for intermediate-level students. Being aware of the cognitive load created by RWL is also a consideration for practitioners. Realizing that listening is a very complex and difficult skill to learn, and that RWL could add to that difficulty, can be very helpful when planning activities for helping our students with listening comprehension. Other insights gained from this study is the correlation of proficiency level to the gains realized by L2 learners using RWL. Practitioners should consider the level of the student when presenting material to students and when creating curriculum that includes RWL. Hopefully this study will motivate educators to use RWL in the classroom or as homework to give their students more opportunities for listening input.

Conclusion

Reading-while-listening is a teaching strategy used in classrooms to help students with listening comprehension. RWL was used as a semester-long pedagogical strategy and as such

was shown to provide small gains to intermediate-level ESL students listening comprehension skills; however, intermediate level students may not be able to take full advantage of RWL possibly due to the cognitive load created by reading and listening at the same time. This study, in combination with previous similar studies looking at RWL as a teaching strategy, has shown that using RWL as a teaching strategy can help intermediate-level L2 learners with small gains in listening comprehension, however, more research is needed in order to more fully discover the effects of cognitive load and proficiency level on the benefits of RWL as a pedagogical strategy.

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APPENDIX A: Listening Passage Examples

Week 2 Unit 1 (1.8)

Emma: I'm sorry, can I interrupt? Some people say that nuclear energy doesn't pollute the air, but that's not completely true. It takes many years to build a nuclear power plant. During this time, hundreds of machines work day and night and pollute the air in the area. I don't think it's necessary to build nuclear power plants when we have safer and more environmentally friendly energy sources, such as solar and wind energy. They are cheaper and they are unlimited sources of energy. Furthermore, they are more affordable for most countries, when compared with nuclear power. Building a nuclear power plant is not a solution for poor or developing countries.

Jack: I'm not sure about that. I think that building nuclear power plants is the perfect solution for many poorer countries. Yes, it might be expensive to build the plant, but once the nuclear plant is there, the cost of the production of energy is very low. What's more, the country can sell the electricity to its neighbors and improve its economy. It's a long-term solution. Moreover, it makes a country less dependent on oil and gas. At the moment, whenever oil or gas prices go up, it's the poor countries and poor people who suffer. Some people think that solar and wind energy are greener than nuclear energy. However, I don't think that's accurate. Wind turbines are not exactly friendly for birds, not to mention that solar panels and wind turbines take up a lot of space. They are also very expensive and do not last as long as a nuclear power plant. In short, wind and solar energy can't solve the problem of climate change, and they aren't a good solution for poor countries.

Host: Thank you both very much. Let's take some questions from the audience …

Week 6 Unit 4 (4.2) (second half 2:58-5:06)

Host: In your book, you discuss how technology has changed the way we celebrate important holidays.

Dr. Lee: That's right. A simple example is sending cards or messages. In the past, people sent each other cards to celebrate important events like birthdays and anniversaries. But now, more people send messages through social networking sites or by email. Another example of changing customs is holiday food. A few generations ago, people spent a lot of time and effort preparing special meals for celebrations. It was usually the women who did this. Some dishes could take up to a week to prepare. But now we don't have to work so hard. This is because we have modern kitchens and supermarket food. We don't have to spend endless hours making our own butter or bread anymore. Everything is quicker and easier now.

Host: Hmm … I remember my grandmother working for days to make food. She had a huge cookbook that she got from her grandmother. Everything had to be exactly as it was when she was a little girl.

Dr. Lee: That's a good example of a tradition that has been replaced by technology. You can find any recipe you want on the Internet. This means that many people don't need cookbooks anymore. Another thing is that many families now go out instead of cooking at home. In India, for example, families hire catering companies to provide food for weddings or special occasions. In the United States, on Thanksgiving, which is one of the biggest celebrations, many families go to restaurants because they don't want to spend their holiday working in the kitchen.

Host: So people do continue their tradition of eating a special meal – they just do it in a different way.

Dr. Lee: Yes. Traditions don't always die out – but customs and traditions do change and

adapt to the modern world.

Week 12 Unit 7 Listening 1 (7.1)

Adele: That reminds me of smart fabrics. I saw an exhibit about them at the science festival. Some scientists are working on fabrics that can kill bacteria and regulate body temperature.

Clara: Wow! How does that work?

Adele: Well, these fabrics keep your body temperature the same in any kind of weather. And I read that they can be used to make sports clothing, which would help people who exercise in very cold or very hot climates.

Clara: Really? That is amazing.

Adele: I've also read that there are other fabrics that can help reduce muscle aches and prevent us from getting sick.

Clara: Wow, that is so cool. You know, I saw a fashion show once where the designers used lights in the clothes. It was a dress made from lights. They change color as you move.

Adele: But what was the point of that?

Clara: Well, I do agree that it's not very practical. I don't think there are many people dying to wear a dress made of lights. It sounds like someone designed it just for the fun of it.

Adele: I'm not crazy about that idea, to be honest. As far as I'm concerned, a dress made from lights is useless. Anyway, it looks like we've finally come up with some good ideas.

Clara: Yeah, I agree. So, we have clothes that are environmentally friendly, clothes that help with our health, and clothes that use technology. Which one should we focus on?

Adele: I like the idea of clothes that help people with health problems.

Clara: Are you sure? It seems pretty complicated.

Adele: Yeah, I think it'll be fine. I do think it'll be interesting, and there are a lot of different

articles on the topic.

Clara: OK, let’s do it!