

Effects of captions and subtitles on the listening process: Insights from EFL learners' listening strategies

Kyoko Hosogoshi

Kyoto Prefectural University
hosogoshi@kpu.ac.jp

Captions and subtitles as a form of scaffolding for audiovisual materials has gained much attention in second or foreign language (L2) learning in recent years and various studies report their positive effects on learners' listening comprehension. However, few attempts have been made to investigate how textual information specifically affects the listening process. The present study aims to examine the relationship between on-screen text and the listening process with special reference to 11 distinct listening strategies. A total of 114 first-year Japanese-speaking EFL learners were divided into three groups: no-text group, English caption group, and Japanese subtitle group. Each group was instructed to watch a university lecture video in English under its assigned condition and to answer a questionnaire about the listening strategies employed during the listening activity. The major findings obtained from the present study include (1) the degree of use of imagery and summarization strategies was significantly higher in the subtitle group, and (2) most of the listening strategies relevant to each listening process showed more inter-correlation in the no-text and the caption groups than in the subtitle group throughout the listening process. Pedagogical implications concerning when to use captions and subtitles for L2 listening instruction are discussed.

Keywords: Captions; Subtitles; Listening strategies; Questionnaire; English as a foreign language

Introduction

Although listening is one of the essential skills for second or foreign language (L2) **153**

learning, L2 learners tend to perceive it to be the most difficult skill in practice. In Japan particularly, learners of English as L2 often lack sufficient experience of listening to English input outside classroom. Despite the fact, many learners are required to meet high demands of English for Academic Purposes (EAP) upon entering university. Japanese university students, who are the focus of the present study, are sometimes asked to acquire skills to comprehend academic audio content, such as lectures, delivered in the target language regardless of their relatively low L2 proficiency, which may be due to the lack of L2 input. One way language educators can address this shortcoming is to explore possible ways to scaffold learners' listening skill development while letting them engage in authentic academic listening tasks.

Utilizing "captions" and "subtitles" – on-screen textual information with audiovisual materials – can help L2 learners develop listening skills using authentic materials, without modifying the speed of the material or linguistic features, such as grammar and vocabulary. "Captions" are generally defined as L2 on-screen text presented in tandem with a soundtrack in the same language, and "subtitles" are on-screen text in the viewers' native language (L1) with a soundtrack in their L2 (Markham, 1999). Several studies have explored the use of captions and subtitles along with audiovisual materials and suggest a positive effect on L2 learning primarily in the following ways: improving listening comprehension, fostering vocabulary learning, developing oral production skills, and lowering learners' anxiety (for comprehensive reviews, see Danan, 2004; Perez, Noortgate, & Desmet, 2013; Vanderplank, 2010, 2013).

Compared to the many theoretical frameworks discussing the effects of captions and subtitles, relatively few studies empirically examine the actual process of how L2 learners refer to such on-screen text for listening comprehension (Vanderplank, 2010). This may be attributed to the difficulty of exploring the underlying mental processes during such listening activities. Nevertheless, it is essential to understand how on-screen text affects learners' information processing during listening in order to make an optimal use of such textual scaffolding for process-oriented listening activities. Winke, Gass, and Sydorenko (2013) have investigated process-oriented listening using eye-tracking techniques to capture learners' caption watching time. The study successfully reported that different L2 captions may gather attention of learners, who share the same L1, for a different duration possibly due to the influence of L2 linguistic features including orthography. More research is anticipated to uncover what kind of mental processing occurs when learners watch captions and subtitles during listening.

The present study focuses on L2 learners' use of listening strategies as a means to investigate the effect of captions and/or subtitles on the listening process. Listening strategies as reported by the learners themselves is the scope of the present study because their intentional behavior in completing tasks is expected to shed light on their mental processes while viewing videos with or without on-screen textual information (Vandergrift, 2003). More specifically, individual listening strategies while listening with on-screen text are first associated with one or more phases of a three-phase listening processes (Anderson, 1985). Then, by comparing those results among no-text, L1 subtitles, and L2 captions conditions, the study will discuss how different types of textual information might scaffold the listening processes differently.

Captions and subtitles

Effects of captions and subtitles on listening comprehension

Price (1983) first investigated the possible benefits of closed-captions as an educational tool for L2 learners (closed-captions had been used primarily for deaf and hearing-impaired to have access to TV programs). A substantial volume of research has since suggested positive scaffolding effects of captions and subtitles for L2 listening comprehension, vocabulary learning, oral production skills, and the reduction of learners' anxiety.

Perez et al. (2013) reviewed over 150 studies that employed captions and subtitles to select relevant data for a meta-analysis of 30 years of literature. Even though only 18 studies were chosen for the meta-analysis due to lack of necessary information on the specific subject, the researchers reported large-effect size of the use of captions and subtitles on both listening comprehension and vocabulary learning. From their analysis, Perez et al. (2013) suggested substantial benefits from using on-screen textual information along with audiovisual materials not only for reinforcing comprehension of the audiovisual materials but also for better recognition of words within the materials. These findings suggest that providing on-screen texts can facilitate some of the listening processes. Specifically, the former finding regarding reinforcement of comprehension implies a potential benefit for phonological processing or to "match to knowledge of sounds" (Field, 2008, p. 128), and the latter finding regarding recognition of words indicates a possible effect on parsing of speech or to "match to knowledge of words" (Field, 2008, p. 128). Studies excluded from Perez et al. (2013) for methodological reasons also indicated similar results (e.g., Bird & Williams, 2002; Garza, 1991; Guichon & McLornan, 2008). As an example, Garza (1991) asked 70 advanced learners of English and 40 college-level learners of Russian from two universities in the US to watch videos with or without captions and to answer a multiple-choice comprehension test about the content of the videos. The results revealed that those who watched videos with captions significantly outperformed the no-text group. Bird and Williams (2002) compared priming effects of single-mode input (sound or text) and bimodal input (sound and text) on recognition of audio prompt words when they were repeated later. As a result, they found bimodal input to be superior. Bird and Williams argue that this result indicates orthographic input does not interfere but rather facilitates auditory input processing, thus suggesting efficacy in captions and subtitles for listening comprehension.

From a study conducted with 44 intermediate to high level learners of French, Borrás and Lafayette (1994) suggest a beneficial effect on L2 learners' speaking performances during oral description tasks about the content of the videos when providing captions and subtitles along with videos. The researchers also discuss the learners' positive attitudes toward speaking practice with subtitled videos. "[S]ubtitles could make both the comprehension of 'authentic' input and the production of 'accurate' oral/written output less 'painful'" (Borrás & Lafayette, 1994, p. 71). Vanderplank (1988) also suggests the positive effect of captions and subtitles for lowering learners' anxiety. Vanderplank's study observed 15 ESL learners and found captions generally beneficial to their language learning and that participants felt relaxed and attentive while watching the assigned videos with captions.

As the effect of caption and subtitles on listening comprehension continues to be documented, more detailed research is being conducted to identify the optimal conditions of textual information displayed alongside audiovisual materials in order to maximize listening

comprehension. Current attempts involve researching three major domains: language of on-screen text, amount of on-screen text, and the influence of learners' L2 proficiency level.

In general, most studies find that captions are more effective in improving listening comprehension than subtitles (Mitterer & McQueen, 2009; Stewart & Pertusa, 2004). Concerning the amount of textual information provided, Perez, Peters, and Desmet (2014) suggested that keyword captions had the equivalent effects as full captions in terms of detailed comprehension albeit the learners still preferred full-captions and considered keyword captions to be rather distracting. As for learners' L2 proficiency levels, previous research does not yet uphold whether any learner-dependent factors moderate the effects of captions and subtitles. Some studies (Chung, 1999; Winke, Gass, & Sydorenko, 2010) indicate no significant difference with regard to the effect of captions and subtitles correlating to learners' L2 proficiency level. Contrarily, other studies (Guillory, 1998; Neuman & Koskinen, 1992; Taylor 2005) suggest captions are helpful for beginners only when the level of test material is carefully considered so as to be suitable for learners.

Further studies have sought out effective conditions (language, amount, or timing) of providing captions and subtitles to enhance L2 learners' listening comprehension. Another domain that seems worthwhile exploring is the learners' mental processes when referring to captions and subtitles during the listening process. Such information is essential to achieve a comprehensive understanding of the function of on-screen text as a pedagogical tool for listening skills development.

Effects of captions and subtitles on the listening process

As pointed to earlier, previous research has attempted to explain the function of captions and subtitles during the listening process, commonly by discussing various theories or hypotheses rather than by empirically conducting some studies to observe the mental process. Some studies have argued that captions and subtitles influence learners' informational processing. For instance, Pavio's (1986) dual coding theory was employed by Danan (1992) to demonstrate how providing on-screen text may reinforce understanding of the content because such verbally coded items activate their equivalent images (nonverbally coded items) and thus result in successful comprehension. In a similar vein, phonological coding hypothesis, noticing hypothesis, and chunking have been mentioned to maintain the scaffolding effects of caption and subtitles. Other studies focused on the quality of input to suggest the use of on-screen text. Adopting Krashen's (1985) input hypothesis, Huang and Eskey (1999–2000) argue that captions and subtitles make audiovisual input *more* accessible and comprehensible to L2 learners. Similarly, some researchers indicated that simply presenting bimodal input accelerated word recognition and content comprehension (Chung, 1999; Guillory, 1998; Koolstra & Beentjes, 1999).

As previously mentioned in the introduction, an empirical study by Winke et al. (2013) with eye-tracking techniques was conducted with English-speaking learners of Arabic, Chinese, Russian, and Spanish. The researchers found learners used captions to "(a) recognize words they know, (b) chunk streams of speech, (c) understand novel words, and (d) resolve ambiguity" (p. 266). They propose learners' attention to captions may be moderated by the combination of their L1 and L2 due to various linguistic features such as scripts. With this said, the study did not include any comparison of the effects of L1 and L2 subtitles.

Another approach to explore the effects of on-screen text on the listening process is

the learners' strategic behavior. Along with examining learning outcomes of the program, Vanderplank (1988) reported that 15 ESL learners at a British university developed their own listening strategies such as chunking, selective attention, and comprehension checking after studying with captioned videos for nine hours. While its main focus was learners' perceived task difficulty, Taylor (2005) stated that 35% of the beginner level learners of Spanish in the US found captions distracting, and 77% reported that it was difficult to pay strategic attention to three media (sound, picture, and text) at the same time. Despite shedding valuable light on L2 learners' use of listening strategies while processing input via captions and subtitles, these studies lack a more comprehensive framework containing both cognitive strategies as well as meta-cognitive strategies (Vandergrift, 2003).

A more thorough study on learners' use of listening strategies while comprehending L2 videos with on-screen text would help future L2 teachers and learners understand specifically how such textual information may affect the process of listening comprehension. The present study, therefore, aims to examine Japanese university-level EFL learners' use of listening strategies while watching a video in L2 with captions and subtitles. In the following section, a classification of listening strategies is reviewed as a framework of reference to explore learners' behavior in the process of comprehending L2 videos with captions and subtitles.

Listening strategies

Classification of listening strategies

Despite a substantial amount of research on listening strategies (e.g., their classification, use by learners, and instruction), few studies have specifically defined what constitutes listening strategies. The present study adopts the definition of learning strategies by O'Malley, Chamot, and Kupper (1989), defining listening strategies as "[m]ental processes that are activated in order to understand new information that is ambiguous or to learn or retain new information (p.422)" while listening.

Many researchers attempt to create a classification of listening strategies to cover various strategic behaviors L2 learners utilize based on empirical studies of learning strategies and learners' self-reports (e.g., Chamot & O'Malley, 1987; Goh, 2002; Thompson & Rubin, 1996; Vandergrift, 1999, 2003). In the present study, Vandergrift's (2003) taxonomy of listening strategies is adopted because it provides a comprehensive picture of strategies listeners may adopt while listening for comprehension. The taxonomy includes two major types of listening strategies: *cognitive strategies* and *metacognitive strategies*. According to Vandergrift (1999), *cognitive strategies* "manipulate the material to be learnt or apply a specific technique to the learning task" (p. 170); while *metacognitive strategies* "oversee, regulate, or direct the language learning process" (p. 170).

In Vandergrift's (2003, pp. 494–496) taxonomy¹, *cognitive strategies* contain seven categories: *inferencing*, *elaboration*, *imagery*, *summarization*, *translation*, *transfer*, and *repetition*. More specifically, *inferencing* refers to the use of information within the text for guessing the meanings of unfamiliar language items. *Imagery* includes employing mental or actual pictures to retain information. *Summarization* is making a mental or written summary of information from listening materials. *Metacognitive strategies* consist of four categories: *planning*, *monitoring*, *evaluation*, and *problem identification*. To clarify, *planning* indicates to make an appropriate action plan to accomplish a listening task. *Monitoring* includes

checking, verifying or correcting one's comprehension throughout a listening task. The present study will explore all of the 11 listening strategies in the Vandergrift's taxonomy with a goal of grasping a comprehensive understanding of L2 learners' behavior while listening with textual information such as captions and subtitles.

Listening strategies and the listening process

The present study aims to discover how the use of captions and subtitles affects the process of listening comprehension in relation to learners' listening strategy use. It is essential to understand how each listening strategy is used by L2 learners in the course of comprehension. Goh's (2000) study attempts to identify the relationship between phases of the listening process and individual listening strategies. Adopting Anderson's (1985) three-phase model of comprehension, where the listening process consists of *perceptual processing*, *parsing*, and *utilization*, Goh summarizes how types of strategy-focused listening practice relate to the process of listening comprehension (Table 1). The strategy categories in Table 1 were added as a reference to Vandergrift's (2003) taxonomy of listening strategies in order to illustrate the relationship between listening strategies and listening comprehension more clearly. As shown in Table 1, *inferencing*, *elaboration*, *planning*, and *problem identification* are considered relevant listening strategies with the first phase of *perceptual processing*, where a listener's attention is first paid to the acoustic message and sounds are retained in the echoic memory. During the *parsing* phase, where words are transformed into a mental representation of the combined meaning of the words, *inferencing*, *imagery*, *summarization*, and *planning* are implemented. Finally, *inferencing*, *elaboration*, *imagery*, *summarization*, *planning*, and *monitoring* are scaffolds of the *utilization* phase, where the mental representation is associated with existing knowledge to generate a meaningful representation of the original sequence. Other listening strategies, such as *translation*, *transfer*, and *repetition*, are not considered in the present study.

Before moving on to a description of the methods of the present study, it is beneficial to review actual listening strategies used by more proficient listeners, or "good language listeners," in order to identify preferable strategic behaviors. In general, "good language listeners" tend to use a wide range of listening strategies more frequently in combination compared to less proficient listeners (e.g., Berne, 2004; Chamot, 2004). In particular, more proficient listeners are reported to employ more metacognitive strategies as well as inferencing, elaboration, imagery, and summarization, but less superficial and text-dependent strategies such as translation (e.g., O'Malley et al., 1989; Rost & Ross, 1991).

Graham and Santos (2015) maintain that flexibility in the use of *metacognitive strategies* to monitor, evaluate, and modify one's own *cognitive strategies* when necessary is one of the significant characteristics of more proficient learners. The researchers also point out that *selective attention*, a type of *planning*, is problematic for less proficient learners because they may treat any information they could randomly catch with their ears as important, essentially paying undue attention to the point of misunderstanding. From their study, a combinational use of metacognitive strategies with cognitive strategies seems to be a suitable valuable to examine learner's adequate listening behavior.

In the Japanese context, Siegel (2015) discovered that the most useful listening strategies Japanese university students reported were *prediction* and *listening for details/keywords* during a longitudinal listening strategy instruction. In Vandergrift's (2003) taxonomy, they are cognitive strategies; *prediction* is equivalent to *inferencing*, and *listening for details/keywords*

Table 1. Listening strategies and listening comprehension² (based on Goh, 2000).

Listening strategy practice	Strategy categories ³	Perception	Parsing	Utilization
Cognitive tactics				
Infer missing or unfamiliar words using contexts, co-text and prior knowledge	Inferencing, Elaboration	*		*
Predict general contents before listening using contexts and prior knowledge	Inferencing, Elaboration	*		*
Predict unfinished utterances using contexts, co-text and prior knowledge	Inferencing, Elaboration	*		*
Use prior knowledge to elaborate and complete interpretation	Elaboration			*
Take short notes of important content words	Summarization		*	*
Relate limited interpretation to a wider social/linguistic context	Inferencing			*
Relate one part of the text to another	Inferencing			*
Visualize scenes, objects, events etc. being described	Imagery		*	*
Reconstruct meaning using words heard	Inferencing		*	*
Metacognitive tactics				
Preview contents in different forms	Planning	*		
Rehearse the pronunciation of potential content words	Planning	*		
Establish purpose for listening	Planning	*		*
Listen selectively according to purpose	Planning	*	*	*
Pay attention to discourse markers	Planning		*	*
Pay attention to visuals and body language	Planning, (Inferencing)	*		*
Pay attention to tones and pauses	Planning, (Inferencing)	*	*	
Monitor comprehension using contexts and prior knowledge	Monitoring			*
Evaluate comprehension using contexts, prior knowledge and external resources	Evaluation			*
Continue to listen for clarification in spite of difficulty	Planning	*		
Assess the importance of problematic parts and decide whether to ignore them or actively seek clarification	Planning, Problem identification	*		
Determine the potential value of subsequent parts and vary intensity of attention accordingly	Planning	*		

would be *elaboration*. It is interesting to note that these findings indicate Japanese students value *cognitive strategies* over *metacognitive strategies*.

With these findings in mind, the present study will examine the listening strategies used by participants.

Research question

The purpose of the present study is to examine whether the type of captions and subtitles employed affects L2 learners' use of listening strategies during the three-phase listening processes. The present study aims to answer the following research question:

- ✧ To what extent does the use of captions, subtitles, and no-text affect L2 learners' use of listening strategies for perceptual processing, parsing, and utilization?

Methods

Participants

A total of 114 Japanese undergraduate university students studying EFL participated in the present study. They were all first-year university students from the Faculties of Law, Engineering, and Science who attended academic writing classes taught by the same teacher. Their average TOEFL® PBT score was estimated as 460 (out of 677), based on the results of a placement test conducted for the present study (see Educational Testing Service, 1997 for the conversion chart)⁴.

Materials and instruments

Placement test. In order to divide the participants into three homogeneous groups according to their listening proficiency, the participants were assigned to take a listening test adapted from TOEFL® Practice tests (Educational Testing Service, 1997). The test format follows that of actual TOEFL PBT® tests; it consists of 50 questions and takes approximately 40 minutes to complete. Participants were asked to choose the best answer from four possible choices for each question after listening to conversations or monologues. As for short conversations (30 questions), the questions targeted predicting consequences of the conversations, and for longer conversations (10 questions) and monologue lectures (10 questions), students were asked to listen for main ideas as well as supporting details. As a result, three relatively homogeneous groups were generated based upon their scores: $F(2, 111) = 0.07, p = .93$: no-text group: $n = 38, M = 22.61, SD = 36.65$; caption group: $n = 38, M = 23.11, SD = 36.63$; subtitle group: $n = 38, M = 22.87, SD = 30.11$.

Lecture video, captions, and subtitles. A lecture video (Friedman, 2007) in English about globalization was employed for the present study. The video was a four-and-a-half-minute long excerpt from a lecture held at the Massachusetts Institute of Technology, which was selected from MIT OpenCourseWare.

The lecture was transcribed and translated into Japanese by the author, and a Japanese-English bilingual speaker ensured the translation's accuracy. Apple QuickTime 7 Pro was used to superimpose the English transcript captions and Japanese translation subtitles onto

the video. The captions and subtitles were displayed at the bottom of the frame in white to be seen clearly against grayish background pictures.

Listening strategy questionnaire. Among several approaches for investigating learners' strategy use during listening tasks such as think aloud protocols, retrospective interviews, and questionnaires, the present study employed questionnaires with the following two intentions. First, questionnaires were thought to be more suitable to let the participants involve in listening tasks without any interruption compared to think aloud protocols. Second, questionnaires were expected to comprehensively cover various kinds of listening strategies proposed in the literature. Retrospective interviews may also be helpful for exploring learners' specific perceptions, however, questionnaire data based on a Likert-scale would be more useful when comparing overall tendencies among different groups. When discussing the results of a questionnaire study, however, it is essential to note that the results are based on the participants' self-reports as to what they believe they had been doing during listening tasks, and that such reported strategy use may sometimes contradict the participants' actual mental processes.

Although various questionnaires have been developed which aim to assess L2 learners' perceived listening strategy use, most do not seem directly applicable to the present study because they do not satisfactorily follow a holistic classification of listening strategies (Vandergrift, 2003). Therefore, a new questionnaire with 75 items was developed for the present study to assess L2 learners' reported use of listening strategies. Based on Vandergrift's (2003) taxonomy of listening strategies, the questionnaire consisted of multiple scales for 11 listening strategies, some of which have sub-components. Some items were directly adopted from other questionnaires (e.g., Nakatani, 2006; Vandergrift, Goh, Mareschal, & Tafaghodtari, 2006; Zhang & Goh, 2006); other items were supplemented using descriptions from related literature on listening strategies. Some items were negatively worded to avoid the "acquiescence bias" (Dornyei, 2003), whereby people tend to agree with ambivalent statements. The questionnaire asked participants' degree of agreement to statements about various strategies that they believed themselves to have been using during the video-viewing task on a five-point Likert scale: 1 = *strongly disagree*, 2 = *somewhat disagree*, 3 = *neither agree nor disagree*, 4 = *somewhat agree*, 5 = *strongly agree*. All of the items were written in the participants' L1 (Japanese).

In order to assess the validity of the primary version of the questionnaire, a pilot study with 86 first-year students from the same university, all of whom were different from the participants of the present study, was conducted. After watching a short lecture video in English, the participants were asked to answer the questionnaire and mark unclear items or expressions. Using the pilot data, the internal consistency of the questionnaire items was examined by calculating the Cronbach's alpha value ($\alpha = .78$). As a result, a questionnaire with a total of 75 items was set for the present study (see Appendix A).

Listening comprehension test. A listening comprehension test was developed for the present study in order to assess learners' degree of comprehension of the lecture video. Though the main focus of this study was investigating learners' perceived strategy use and not their degree of comprehension, the test was implemented to orient the participants to actively participate in the lecture listening task for comprehension. The test consisted of 10 multiple-choice questions and examined the participants' understanding of the main idea as well as

supporting details of the lecture video. All questions and choices were written in English and the participants were assigned to choose the best answer from four possible choices.

Procedure

The present study was conducted during the first two weeks of one-semester-long academic English classes. The classes were held in a computer-assisted language learning classroom where participants were provided with same-spec computers with 20 inch-wide screens and headphones. In the first week, participants took the listening section of a TOEFL® practice test using the last 40 minutes of class time. After this placement test, participants were divided into three homogeneous groups (no-text group, caption group, and subtitle group) according to their scores on the placement test (see Section 4.2.1).

In the second week, participants were asked to complete a task programmed on Blackboard, an internet-based learning management system (LMS). First, participants viewed the lecture video shown on each computer for four-and-a-half minutes under their assigned conditions (no-text, captioned, or subtitled). Participants were allowed to watch the video only once; they were not able to pause or rewind the segment once they started playing the video. Immediately after watching the video, the listening comprehension test was presented on the participants' computer screen. The participants were asked to answer all the questions within five minutes. They then completed the on-screen, 75-item questionnaire concerning their strategic behavior when listening to the lecture. About 15 minutes were provided to answer the questionnaire. Throughout the task, participants were instructed to work on their task individually on their own computer.

Data analyses

To identify the effects of on-screen texts on listening strategies, the present study calculated the means of participants' responses to the listening strategy questionnaire items in each of the 11 categories (Table 2). The data of the three groups were then analyzed by a one-way ANOVA test to determine if there was a significant difference in the degree of given strategies used among the three groups. Subsequently, Tukey's test was applied as multiple comparisons after the ANOVA test.

In addition, the 11 categories of listening strategies were analyzed by calculating Pearson product-moment correlation coefficients within each group. These correlations were analyzed to identify and compare the participants' use of strategies under different audiovisual conditions in more detail.

Table 2. Number of items in each of the 11 listening strategy categories.

Category	Number of items	Category	Number of items
Cognitive Strategies	46	Metacognitive Strategies	29
1. Inferencing	13	A. Planning	15
2. Elaboration	15	B. Monitoring	8
3. Imagery	3	C. Evaluation	3
4. Summarization	3	D. Problem identification	3
5. Translation	4		
6. Transfer	3		
7. Repetition	5		

Note: The categories which have sub-components tend to include greater number of items.

Results

The listening comprehension test

As an aim of having the participants concentrate on the lecture listening task, a listening comprehension test about the lecture was conducted. The test scores were also compared among the three groups to examine the effect of the text conditions for L2 listening comprehension. The results of the one-way ANOVA of the test scores among the three groups are displayed in Table 3.

Table 3. One-way ANOVA of the listening comprehension test.

	No-text (n = 38)	Caption (n = 38)	Subtitle (n = 38)	F value
Comprehension	4.08	4.92	6.13	15.08*
test score	1.53	1.72	1.66	

Note: Score ranges from 0 to 10. In each column, upper number indicates mean and lower number indicates standard deviation. * $p < .05$.

As shown in Table 3, the subtitle group obtained the highest score on the listening comprehension test, followed by the caption group and the no-text group; a post hoc analysis with Tukey's test found, however, only the difference between the subtitle group and the no-text group to be significant.

The use of each listening strategy

Results of the present study showed that the type of on-screen text affected the degree of L2 learners' perceived use of some listening strategies. Table 4 displays the overall result of the one-way ANOVA test among the three groups⁵.

As shown in Table 4, there were significant differences in the learners' reported use of **163**

imagery and *summarization* strategies according to the condition of on-screen texts. A post hoc analysis revealed that those who viewed the video with subtitles claimed to use *imagery* strategies significantly more often than those with captions; the learners who watched the video without on-screen texts also tended to employ *imagery* strategies more than those with captions; yet the difference was not statistically significant. As for *summarization* strategies, learners who watched with subtitles claimed to make *summarizations* significantly more often than those without captions; those who watched with captions had a tendency to report the strategy more than those without captions; yet, again, the difference is insignificant. The three groups showed no significant difference in perceived use of other *cognitive strategies*: *inferencing*, *elaboration*, *translation*, *transfer*, and *repetition*, nor any kind of *metacognitive strategies*: namely, *planning*, *monitoring*, *evaluation*, or *problem identification*.

Table 4. One-way ANOVA of the listening strategy questionnaire.

Category	No-text (n = 38)	Caption (n = 38)	Subtitle (n = 38)	F value
Cognitive S.	2.91	2.92	2.89	0.03
($\alpha = .72$)	0.48	0.44	0.40	
1. Inferencing	2.93	2.92	2.79	0.56
($\alpha = .80$)	0.73	0.64	0.60	
2. Elaboration	3.19	3.03	2.96	1.88
($\alpha = .78$)	0.47	0.51	0.61	
3. Imagery	2.82	2.65	3.22	3.61*
($\alpha = .73$)	0.98	0.92	0.95	
4. Summarization	2.49	2.85	3.20	5.66*
($\alpha = .60$)	0.80	0.96	0.99	
5. Translation	2.54	2.96	2.91	1.95
($\alpha = .82$)	1.07	0.96	1.03	
6. Transfer	3.03	3.18	3.09	0.23
($\alpha = .47$)	1.03	1.07	0.98	
7. Repetition	2.54	2.58	2.44	0.43
($\alpha = .57$)	0.70	0.76	0.60	
Metacognitive S.	2.90	2.99	2.90	0.41
($\alpha = .87$)	0.60	0.61	0.34	
A. Planning	3.12	3.19	3.11	0.29
($\alpha = .69$)	0.53	0.60	0.32	
B. Monitoring	2.68	2.81	2.73	0.30
($\alpha = .80$)	0.78	0.70	0.67	
C. Evaluation	2.78	2.85	2.71	0.23
($\alpha = .62$)	1.10	0.87	0.72	
D. Problem identification	2.50	2.66	2.49	0.46
($\alpha = .68$)	0.78	1.04	0.70	

Note: S = strategies. α = Cronbach's alpha value. In each column, upper number indicates mean and lower number indicates standard deviation. * $p < .05$.

The combinational use of listening strategies

Tables 5 to 7 summarize how listening strategies relevant to specific listening processes correlate with each other in the three groups.⁶ As presented, throughout the listening processes, the relevant listening strategies were found to be more inter-correlated in both the no-text and caption groups compared to the subtitle group. In particular, no *cognitive strategies* correlated with any *metacognitive strategies* under the subtitle condition in the stages of *perceptual processing* and *parsing*. Even in the *utilization* phase, *cognitive strategies* did not have significantly positive correlations with *metacognitive strategies* except for *monitoring*.

The data indicated that when listening with subtitles, learners tended to use listening strategies independently without the orchestrating of any *metacognitive strategies*.

Table 5. Correlation matrices of listening strategies related to *perceptual processing* process.

Table 5.1 No-text group

Category	1	2	A	D
1. Inferencing				
2. Elaboration	++			
A. Planning	++	++		
D. Problem identification			++	

Note: +: $p < .05$, ++ : $p < .01$.

Table 5.2 Caption group

Category	1	2	A	D
1. Inferencing				
2. Elaboration	++			
A. Planning		++		
D. Problem identification	+	++	++	

Note: +: $p < .05$, ++ : $p < .01$.

Table 5.3 Subtitle group

Category	1	2	A	D
1. Inferencing				
2. Elaboration	++			
A. Planning				
D. Problem identification				

Note: +: $p < .05$, ++ : $p < .01$.

Table 6. Correlation matrices of listening strategies related to *parsing* process.

Table 6.1 No-text group

Category	1	3	4	A
1. Inferencing				
3. Imagery	++			
4. Summarization	+	++		
A. Planning	++	++		

Note: +: $p < .05$, ++ : $p < .01$.

Table 6.2 Caption group

Category	1	3	4	A
1. Inferencing				
3. Imagery	++			
4. Summarization	++	++		
A. Planning		+		

Note: +: $p < .05$, ++ : $p < .01$.

Table 6.3 Subtitle group

Category	1	3	4	A
1. Inferencing				
3. Imagery	++			
4. Summarization				
A. Planning				

Note: +: $p < .05$, ++ : $p < .01$.

Table 7. Correlation matrices of listening strategies related to *utilization* process.

Table 7.1 No-text group

Category	1	2	3	4	A	B	C
1. Inferencing							
2. Elaboration	++						
3. Imagery	++	++					
4. Summarization	+		++				
A. Planning	++	++	++	+			
B. Monitoring	++	++	++	++	++		
C. Evaluation	++	++	++	++	++	++	

Note: +: $p < .05$, ++ : $p < .01$.

Table 7.2 Caption group

Category	1	2	3	4	A	B	C
1. Inferencing							
2. Elaboration	++						
3. Imagery	++						
4. Summarization	++	++	++				
A. Planning		++	+	+			
B. Monitoring		++	++	++	++		
C. Evaluation		++		+	++	++	

Note: +: $p < .05$, ++: $p < .01$.

Table 7.3 Subtitle group

Category	1	2	3	4	A	B	C
1. Inferencing							
2. Elaboration	++						
3. Imagery	++						
4. Summarization							
A. Planning							
B. Monitoring	+	++	+				
C. Evaluation							

Note: +: $p < .05$, ++: $p < .01$.

Discussion

The use of each listening strategy

One interesting finding is that both *imagery* and *summarization* strategies, which were employed more frequently by the subtitled group, are classified as listening strategies related to the phases of *parsing* and *utilization* in Goh's (2000) study. The fact that *imagery* and *summarization* strategies were reported to have been used more perhaps indicates that the learners were able to focus on the last two phases of the listening processes. That is, the first phase of *perceptual processing* may have been facilitated by the effect of subtitles which provide some related knowledge to activate one's schema and thus prepared listeners for upcoming speech segment. As a result, the learners might have been able to save more cognitive capacity and allocate it to analyzing the syntactic structures of the audiovisual input (*parsing*) and to extracting the meaning of the input by consulting their existing knowledge (*utilization*).

The above interpretation suggests that subtitles may modify audiovisual input into comprehensible input. In other words, the on-screen L1 text might have scaffolded L2 learners' decoding of the continuous speech stream thereby reducing their cognitive load. This finding should be regarded as a welcome pedagogical implication, because Goh (2000) reports perceptual processing is the most problematic phase for L2 listeners consisting of 5 out of 10 real-time comprehension problems. One might argue that the results of the subtitled

condition merely suggest that the learners have engaged entirely in L1 reading and not in L2 listening comprehension at all. However, the L1 reading activities that L1 subtitles require would be somewhat different from conventional reading activities like reading a textbook. Generally speaking, L1 subtitles do not let people control their pace of reading nor go back and forward in the text because the L1 text appears and disappears along with the L2 sound stream. Such an “on-line” nature of the task is rather common to listening comprehension where people are required to identify and understand information within a limited time (Danan, 2004). Furthermore, the result of the listening comprehension test shows that those who watched the lecture with L1 subtitles outperformed the other two groups in the listening comprehension test. Since the test questions and accompanying multiple choices were all provided in the learners’ L2, these data may also imply that the participants could be involved in L2 comprehension activities and not just L1 reading. As Markham, Peter, and McCarthy (2001) point out, L2 learners generally possess higher reading comprehension skills than listening comprehension skills, so they could benefit from subtitles especially when listening to L2 materials.

Therefore, it may be reasonable to suggest that L1 subtitles are beneficial for actualizing the last two phases of the listening comprehension, namely parsing and utilization, while students are engaged in such “on-line” tasks. Previous research on “good language listeners” also supports *imagery* and *summarization* as preferable listening strategies used by more proficient learners (e.g., O’Malley et al., 1989; Rost & Ross, 1991). Thus, the learners’ perceived strategy use documented in the present study provides additional evidence for some of the advantages of the subtitle condition.

English captions were thought to have a similar role of transforming the input into more comprehensible chunks considering that they also present additional information via L2 text (Pavio, 1986). However, the results showed no significant effect of captions on the learners’ perceived use of listening strategies. One possible reason is that the L2 text was more difficult for the learners to read within a limited time compared to reading the L1 text, so captions did not necessarily work as an aid to comprehend the audiovisual input. Researchers like Taylor (2005) also mention the importance of considering linguistic features of a caption such as speech rate and vocabulary level with reference to the target learners’ L2 proficiency.

The combinational use of listening strategies

A further investigation into the learners’ combinational use of listening strategies sheds light on somewhat different considerations about the role of captions and subtitles. The learners’ combinational strategy use was examined supposing that “good language listeners” tend to use a wide range of listening strategies more frequently in combination (e.g., Berne, 2004; Chamot, 2004). When some listening strategies co-occur in the same phase of the listening process, these strategies should present significantly positive inter-correlations albeit the results do not necessarily mean that the two correlating variables are *always* employed by the learners simultaneously.

According to the result shown in Tables 5 to 7, no-text and caption conditions encouraged L2 learners to listen in a similar way with the “good language listeners” who tend to utilize multiple listening strategies in combination. In other words, the processing of subtitled material may have a different characteristic from real-life listening. Subtitles seem to orient the learners to employ listening strategies rather individually, while the on-screen L1

text facilitates the degree of use of specific strategies. This could be explained as, with the help of L1 text, L2 learners focus on using specific strategies helpful for comprehension and might be saving the cost of consulting various strategies. These observations need further investigation, but it might be interpreted as the subtitled condition is at least helpful to focus on specific strategy use effective for utilizing the message of the listening material. The comprehension test of the present study found the subtitle group achieved the best score among the three groups (Table 3).

Pedagogical implications

Based on the results obtained from the present study, at least two pedagogical implications can be proposed. First of all, L1 subtitles may have some potential for providing learners with opportunities to practice how to parse the decoded information and utilize the intended meaning in their L2 within a limited allotted time. When listening to L2 audio with the help of L1 text, it has been suggested that learners may tend to visualize information to enhance their own understanding of the idea and also to summarize information to organize such understandings. Especially for university students who probably have a strong need for listening to longer lectures and conversations, these imagery and summarization skills might be essential to process a volume of incoming linguistic information as a means to understand the gist. Consequently, as an example, L1 subtitles could be employed for note-taking activities. Then learners can get familiarized with common logical flows of lectures or speech acts and practice how to activate relating schema for rapid utilization of the message under time pressure. Second, for the purpose of practicing listening comprehension under more authentic conditions, the L2 captions and no-text conditions can be suggested as appropriate options for instruction. Once learners are familiar with common characteristics of L2 listening such as some of the frequently used logical organizations of lectures with subtitles, it would be a good occasion to let them move on to try real-life listening settings, with captions and eventually without any textual help. As such, different textual information would offer the teachers and learners appropriate scaffolding options to keep focused in the course of L2 listening instruction.

Conclusion

The present study has revealed that the use of captions, subtitles, and no-text could moderate learners' perceived use of listening strategies. Consequently, subtitles may allow L2 learners' frequent use of specific listening strategies (i.e., *imagery* and *summarization*), perhaps because subtitles can possibly reduce their cognitive load. These strategies are especially valuable for the *parsing* and *utilization* processes. Since there are not many *cognitive strategies* concerned with the *parsing* process, subtitled materials should play an important role in allowing L2 learners to focus on the process of syntactic analyses while listening. Consequently, L1 subtitles could be recommended as a scaffold for L2 learners to practice how to decode the syntactic structure of the delivered L2 input in order to comprehend its intended meaning in their L2.

On the other hand, the correlational analyses revealed that the no-text or caption conditions facilitate the most variety of combinational use of listening strategies, which is a common feature of "good language listeners." Especially, the combination of a *cognitive strategy* along with a *metacognitive strategy* seems to be facilitated in the no-text and caption

condition. Therefore, if language teachers wish to provide real-life listening settings for learners, no-text or captioned materials may be more preferred.

One methodological issue that needs to be carefully addressed is whether listening strategy use reported by L2 learners can fully depict what and how they pay attention to, decode, and understand the input message with the supports of on-screen text. As Chamot (2004) claims, learners may overestimate or underestimate the strategies they actually used. In addition, the author developed many of the instruments used in the present study, such as the listening strategy questionnaire. Although these measures were carefully developed through pilot studies, the reliability and validity of these instruments could be further examined. Thus, future studies should explore a more thorough technique to capture learners' internal processing.

Despite the above considerations, the present study has shed some light on the listening processes that the use of captions and subtitles might affect. This leads to some pedagogical implications as to when and how to use such on-screen text to develop learners' listening skills. Specifically, the present study has demonstrated L1 subtitles may possibly facilitate the last two phases of the listening processes. A future direction of the study, therefore, could be further exploring the influence of L1 subtitles and L2 captions onto the first phase of the listening processes, namely perceptual processing. Such process-oriented studies will continue to document valuable insights regarding the effects of the use of textual information in listening skills pedagogy.

Acknowledgements

The author would like to thank Dr. Akira Tajino and Dr. Sachi Takahashi from Kyoto University, Japan for their advice on the research design and earlier versions of this paper. The author would also like to thank all the students who participated in the study. This study was funded by a grant from the Japan Society for the Promotion of Science (Grant-in-Aid for JSPS Fellows 25-7914).

Notes

This paper is based on a talk first presented at 50th Commemorative International Convention of the Japan Association of College English Teachers held at Seinan Gakuin University, Japan, September 2011.

1. For example descriptions of each category, see items in Listening strategy questionnaire used for the present study in Appendix A.
2. The asterisk indicates the listening strategy practice relates to the phase of listening comprehension. The types of perception practice and social-affective tactics in Goh (2000) are excluded since they are not relevant to the present study.
3. The strategy categories were added by the author with a reference to Vandergrift's (2003) taxonomy of listening strategies.
4. Their English proficiency can be described as B1 level (Independent User) of Common European Framework of Reference for Languages (CEFR) according to a conversation chart by Educational Testing Service (2014). The following is the descriptor of CEFR B1 listening level:

- encountered in work, school, leisure, etc. I can understand the main point of many radio or TV programmes on current affairs or topics of personal or professional interest when the delivery is relatively slow and clear. (Council of Europe, 2014, p. 24).
5. In the process of data analysis, two items (item 44 about *transfer* strategy and item 72 about *selective attention* strategy) were omitted in order to maintain acceptable internal consistency in terms of Cronbach's alpha of each scale.
 6. The complete correlation matrices of the 11 listening strategies of each group are displayed in Appendix B.

References

- Anderson, J. R. (1985). *Cognitive psychology and its implications* (2nd ed.). New York: Freeman.
- Berne, J. E. (2004). Listening comprehension strategies: A review of the literature. *Foreign Language Annals*, 37(4), 521–531.
- Bird, S. A., & Williams, J. M. (2002). The effect of bimodal input on implicit and explicit memory: An investigation into the benefits of within-language subtitling. *Applied Psycholinguistics*, 23(4), 509–533.
- Borras, I., & Lafayette, R. C. (1994). Effects of multimedia courseware subtitling on the speaking performance of college students of French. *The Modern Language Journal*, 78(1), 61–75.
- Chamot, A. U. (2004). Issues in language learning strategy research and teaching. *Electronic Journal of Foreign Language Teaching*, 1(1), 14–26.
- Chamot, A. U., & O'Malley, J. M. (1987). The cognitive academic language learning approach: A bridge to the mainstream. *TESOL Quarterly*, 21, 227–249.
- Chung, J. (1999). The effects of using video texts supported with advance organizers and captions on Chinese college students' listening comprehension: An empirical study. *Foreign Language Annals*, 32(3), 295–308.
- Council of Europe. (2014). *Common European Framework of Reference for Languages: Learning, teaching, assessment*. Retrieved from: http://www.coe.int/t/dg4/linguistic/Source/Framework_EN.pdf
- Danan, M. (1992). Reversed subtitling and dual coding theory: New directions for foreign language instruction. *Language Learning*, 42(4), 497–527.
- Danan, M. (2004). Captioning and subtitling: Undervalued language learning strategies. *Meta: Translators' Journal*, 49(1), 67–77.
- Dornyei, Z. (2003). *Questionnaires in second language research: Construction, administration, and processing*. Mahwah, NJ: Lawrence Erlbaum.
- Educational Testing Service. (1997). *TOEFL practice tests vol. 2*. Princeton: Educational Testing Service.
- Educational Testing Service (2014). *CEFR mapping study*. Retrieved from: https://www.ets.org/toefl_itp/research
- Field, J. (2008). *Listening in the language classroom*. Cambridge: Cambridge University Press.
- Friedman, T. (2007, November 28). The world is flat 3.0. *MIT OpenCourseWare*. Cambridge: MIT World. Retrieved from: <http://mitworld.mit.edu/video/519>
- Garza, T. J. (1991). Evaluating the use of captioned video materials in advanced foreign language learning. *Foreign Language Annals*, 24(3), 239–258.

- Goh, C. C. M. (2000). A cognitive perspective on language learners' listening comprehension problems. *System*, 28, 55-75.
- Goh, C. C. M. (2002). Exploring listening comprehension tactics and their interaction patterns. *System*, 30, 185-206.
- Graham, S., & Santos, D. (2015). *Strategies for second language listening*. UK: Palgrave Macmillan.
- Guichon, N., & McLornan, S. (2008). The effects of multimodality on L2 learners: Implications for CALL resource design. *System*, 36, 85-93.
- Guillory, H. G. (1998). The effects of keyword captions to authentic French video on learner comprehension. *CALICO Journal*, 15(1-3), 89-108.
- Huang, H. C., & Eskey, D. E. (1999-2000). The effects of closed-captioned television on the listening comprehension of intermediate English as a second language (ESL) students. *Journal of Educational Technology Systems*, 28(1), 75-96.
- Koolstra, C. M., & Beentjes, J. W. J. (1999). Children's vocabulary acquisition in a foreign language through watching subtitled television programs at home. *Educational Technology Research & Development*, 47(1), 51-60.
- Krashen, S. D. (1985). *The input hypothesis: Issues and implications*. New York: Longman.
- Markham, P. (1999). Captioned videotapes and second-language listening word recognition. *Foreign Language Annals*, 32(3), 321-328.
- Markham, P. L., Peter, L. A., & McCarthy, T. J. (2001). The effects of native language vs. target language captions on foreign language students' DVD video comprehension. *Foreign Language Annals*, 34(5), 439-445.
- Mitterer, H., & McQueen, J. M. (2009). Foreign subtitles help but native-language subtitles harm foreign speech perception. *PLoS ONE*, 4(11), e7785. doi:10.1371/journal.pone.0007785.
- Nakatani, Y. (2006). Developing an oral communication strategy inventory. *The Modern Language Journal*, 90(2), 151-168.
- Neuman, S. B., & Koskinen, P. (1992). Captioned television as comprehensible input: Effects of incidental word learning from context for language minority students. *Reading Research Quarterly*, 27(1), 95-106.
- O'Malley, J. M., Chamot, A. U., & Kupper, L. (1989). Listening comprehension strategies in second language acquisition. *Applied Linguistics*, 10(4), 418-437.
- Pavio, A. (1986). *Mental representations: A dual coding approach*. New York: Oxford University Press.
- Perez, M. M., Noortgate, W. V. D., & Desmet, P. (2013). Captioned video for L2 listening and vocabulary learning: A meta-analysis. *System*, 41(3), 720-739.
- Perez, M. M., Peters, E., & Desmet, P. (2014). Is less more? Effectiveness and perceived usefulness of keyword and full captioned video for L2 listening comprehension. *ReCALL*, 26(1), 21-43.
- Price, K. (1983). Closed-captioned TV: An untapped resource. *MATESOL Newsletter*, 12, 1-8.
- Rost, M., & Ross, S. (1991). Learner use of strategies in interaction: Typology and teachability. *Language Learning*, 41(2), 235-268.
- Siegel, J. (2015). *Exploring listening strategy instruction through action research*. UK: Palgrave Macmillan.
- Stewart, M. A., & Pertusa, I. (2004). Gains to language learners from viewing target language closed-captioned films. *Foreign Language Annals*, 37(3), 438-442.

- Taylor, G. (2005). Perceived processing strategies of students watching captioned video. *Foreign Language Annals*, 38(3), 422–427.
- Thompson, I., & Rubin, J. (1996). Can strategy instruction improve listening comprehension? *Foreign Language Annals*, 29(3), 331–342.
- Vanderplank, R. (1988). The value of teletext sub-titles in language learning. *ELT Journal*, 42(4), 272–281.
- Vanderplank, R. (2010). Déjà vu? A decade of research on language laboratories, television and video in language learning. *Language Teaching*, 43(1), 1–37.
- Vanderplank, R. (2013). “Effects of” and “effects with” captions: How exactly does watching a TV programme with same-language subtitles make a difference to language learners? *Language Teaching*, Available on CJO 2013, 1–16.
- Vandergrift, L. (1999). Facilitating second language listening comprehension: Acquiring successful strategies. *ELT Journal*, 53(3), 168–176.
- Vandergrift, L. (2003). Orchestrating strategy use: Toward a model of the skilled second language listener. *Language Learning*, 53(3), 463–496.
- Vandergrift, L., Goh, C. C. M., Mareschal, C. J., & Tafaghodtari, M. H. (2006). The metacognitive awareness listening questionnaire: Development and validation. *Language Learning*, 56(4), 431–462.
- Winke, P., Gass, S., & Sydorenko, T. (2010). The effects of captioning videos used for foreign language listening activities. *Language Learning & Technology*, 14(1), 65–86.
- Winke, P., Gass, S., & Sydorenko, T. (2013). Factors influencing the use of captions by foreign language learners: An eye-tracking study. *The Modern Language Journal*, 97(1), 254–275.
- Zhang, D., & Goh, C. C. M. (2006). Strategy knowledge and perceived strategy use: Singaporean students’ awareness of listening and speaking strategies. *Language Awareness*, 15(3), 199–219.

Author biodata

Kyoko Hosogoshi is currently a lecturer in the Faculty of Letters at Kyoto Prefectural University. Her research interests include academic listening instruction, task-based language teaching, and computer-assisted language learning.

Appendix A

Listening strategy questionnaire (English translation)

Strategy	Item #	Item
Cognitive strategies		
1. Inferencing		
<i>Linguistic inferencing</i>	2	I guessed the meaning of unknown words using known words in the utterances.
	24	I guessed the development of the talk using known words in the utterances.
	41*	I did not predict what should be told next using known words in the utterances.
<i>Voice inferencing</i>	31	I paid attention to the speaker's tone of voice.
	19*	I did not focus on the way the speaker talked.
	10	I looked at the speaker's hand gestures.
	40	I paid attention to the speaker's body language.
<i>Extralinguistic inferencing</i>	9	I guessed the meaning of unknown words on the basis of the questions or the format of comprehension test.
	34	I guessed the development of the talk on the basis of the questions or the format of comprehension test.
<i>Between parts inferencing</i>	4	I guessed the development of the talk based on the outline of the talk I understood.
	37	I guessed the meaning of unknown words based on the outline of the talk I understood.
	3*	I did not predict what would be told next from the context.
	16	I guessed the meaning of unknown words from the context.
2. Elaboration		
<i>Personal elaboration</i>	1	I tried to think about the contents by elaborating on my prior experience or knowledge.
	29*	I did not use my prior experience or knowledge when thinking about the meaning of unknown words.
	20	I tried to understand what I heard by drawing on my prior experience or knowledge.
<i>World elaboration</i>	35*	I did not think about the contents of the talk by drawing on my common knowledge.
	17	I tried to interpret the meaning of unknown words using common knowledge.
	8	I tried to understand what I heard by judging it by my common knowledge.
<i>Academic elaboration</i>	11	I thought about the contents of the talk by elaborating on knowledge I have gained from school.
	25	I tried to interpret the meaning of unknown words by using what I have learned at school.
	7	I tried to understand what I heard using what I have learned at school.

Strategy	Item #	Item
<i>Questioning elaboration</i>	30	I asked to myself many times to understand the content logically.
	5*	I did not ask to myself many times to interpret the meaning of unknown words.
	21	I asked to myself many times to understand what I heard.
<i>Creative elaboration</i>	14	I tried to understand the contents with creative imagination.
	23*	I did not interpret the meaning of unknown words with creative imagination.
	38	I tried to understand what I heard with creative imagination.
3. Imagery	26	I visualized what I heard as I listened.
	18	I imagined the situation explained by the speaker as I listened.
	46*	I did not imagine the location or situation the speaker told on my mind.
4. Summarization	45	I summarized main points of the talk as I listened.
	32	I took some notes as I listened.
	15*	I did not sort out the information I heard as I listened.
5. Translation	22	I translated the meaning of the utterances into Japanese as I listened.
	6	I changed what the speaker said into Japanese on my mind as I listened.
	33	I translated the utterances word by word.
	28*	I did not listen to the talk by drawing on my Japanese.
6. Transfer	39	I related the English sounds to Japanese (i.e., loan words written in Katakana).
	13	I used my knowledge of Japanese.
	44	I did not use my knowledge of Japanese or other languages (i.e., French).
7. Repetition	36	I repeated the sound of words or sentences in my mind as I listened.
	43	I practiced shadowing while I listened to the talk.
	27*	I did not repeat the sounds of words or sentences in my mind.
	12	I tried to remember the sound of the utterances in the course of listening.
	42	I tried to memorize the words or sentences to understand the flow of the talk.
Metacognitive strategies		
A. Planning		
<i>Advance organization</i>	47	I had a plan in my mind about how I was going to listen before I started to listen.
	66*	I did not think about what needs to be done to accomplish the listening task.
	51	I clarified the objectives of the anticipated listening task before I started to listen.
	64	I had a goal my mind as I listened.
<i>Directed attention</i>	57	I focused strongly on the talk when I had trouble in understanding.
	53	I recovered my concentration right away when my mind wandered.
	74	I tried to get back on track when I lost concentration.
	69*	I gave up concentrating and stopped listening when I had difficulty understanding what I heard.

Strategy	Item #	Item
<i>Selective attention</i>	70*	I did not try to attend to specific information which is supportive in the listening task.
	58	I focused on keywords as I listened.
	55	I intended to understand broader meaning of the contents.
	72	I intended to understand every detail of the contents.
<i>Self-management</i>	63	I did not try to get into the frame of mind of listening to English.
	62	I try to calm myself down as I listened.
	48	I encouraged myself to relax.
B. Monitoring		
<i>Comprehension monitoring</i>	61	I thought if my understanding is correct while listening.
	67	I checked I may misunderstand while listening.
	49	I verified if the story line I understood makes sense as I listened.
	56*	I did not monitor myself as to whether I could understand the talk successfully.
<i>Double-check monitoring</i>	60	I went back and corrected my understanding when I found the meaning of words unclear.
	75	I regularly checked my level of comprehension as I listened to the talk.
	52	I adjusted it right away when I realized that my interpretation was not correct.
	65*	I did not reconsider my interpretation.
C. Evaluation		
	68	I reflected on my level of comprehension after listening.
	54*	I did not think about how much I understood after listening.
	50	I thought back on how I listened after listening.
D. Problem identification		
	71	I tried to see if there are points which need to be reconsidered in their interpretation in the course of listening.
	73	I tried to identify the cause of the problem when I had difficulty in understanding.
	59	I thought what hindered my successful comprehension when I had difficulty in understanding.

*The asterisk put after item number indicates the item is reversed.

Appendix B

Correlation matrices of listening strategies

(B.1) No-text group

	Cog	1	2	3	4	5	6	7	Meta	A	B	C	D
<i>Cognitive strategies</i>	-												
1. Inferencing	.866**	-											
2. Elaboration	.857**	.652**	-										
3. Imagery	.712**	.732**	.593**	-									
4. Summarization	.507**	.366*	.299	.460**	-								
5. Translation	.181	-.146	.048	-.332*	.113	-							
6. Transfer	.359*	.158	.298	.009	.065	.348*	-						
7. Repetition	.750**	.562**	.600**	.479**	.298	.194	.125	-					
<i>Metacognitive strategies</i>	.778**	.616**	.657**	.621**	.502**	.068	.271	.722**	-				
A. Planning	.750**	.567**	.644**	.478**	.401*	.215	.284	.715**	.922**	-			
B. Monitoring	.732**	.596**	.621**	.736**	.519**	-.081	.238	.655**	.902**	.721**	-		
C. Evaluation	.606**	.530**	.499**	.494**	.521**	-.038	.120	.515**	.810**	.659**	.689**	-	
D. Problem identification	.380*	.274	.297	.272	.201	.073	.234	.423**	.682**	.572**	.533**	.458**	-

Note: * $p < .05$, ** $p < .01$.

(B.2) Caption group

	Cog	1	2	3	4	5	6	7	Meta	A	B	C	D
<i>Cognitive strategies</i>	-												
1. Inferencing	.796**	-											
2. Elaboration	.785**	.463**	-										
3. Imagery	.603**	.545**	.299	-									
4. Summarization	.596**	.431**	.513**	.447**	-								
5. Translation	.205	-.089	.019	-.153	-.216	-							
6. Transfer	.370*	.143	.297	.040	-.117	.488**	-						
7. Repetition	.541**	.273	.241	.387*	.304	.207	.004	-					
<i>Metacognitive strategies</i>	.643**	.306	.526**	.429**	.488**	.171	.098	.688**	-				
A. Planning	.550**	.232	.456**	.356*	.390*	.172	.181	.589**	.925**	-			
B. Monitoring	.573**	.299	.442**	.502**	.522**	.008	-.083	.699**	.855**	.645**	-		
C. Evaluation	.485**	.155	.422**	.243	.363*	.243	.117	.556**	.831**	.791**	.558**	-	
D. Problem identification	.635**	.396*	.528**	.308	.406*	.262	.106	.495**	.802**	.598**	.722**	.622**	-

Note: * $p < .05$, ** $p < .01$.

(B.3) Subtitle group

	Cog	1	2	3	4	5	6	7	Meta	A	B	C	D
<i>Cognitive strategies</i>	-												
1. Inferencing	.812**	-											
2. Elaboration	.850**	.581**	-										
3. Imagery	.548**	.665**	.202	-									
4. Summarization	.320	.205	.229	.173	-								
5. Translation	.058	-.369*	-.027	-.137	-.089	-							
6. Transfer	.311	-.059	.159	.065	.064	.579**	-						
7. Repetition	.184	.214	.052	-.023	-.376*	-.144	-.034	-					
<i>Metacognitive strategies</i>	.382*	.261	.336*	.304	.197	.039	.125	-.029	-				
A. Planning	.098	.021	.129	-.004	.175	-.025	.227	-.144	.544**	-			
B. Monitoring	.515**	.404*	.475**	.359*	.143	.040	.024	.036	.818**	.088	-		
C. Evaluation	.006	.014	-.089	.188	.072	-.004	-.108	.099	.496**	-.006	.278	-	
D. Problem identification	.208	.096	.130	.277	.087	.132	.142	-.020	.793**	.145	.687**	.522**	-

Note: * $p < .05$, ** $p < .01$.