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EFFECTS OF ADVANCE ORGANIZERS ON TAIWANESE MIDDLE SCHOOL STUDENTS' ENGLISH-VIDEO LISTENING COMPREHENSION

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ABSTRACT

This study investigated the effects of advance organizers on Taiwanese middle school students' English listening comprehension after they watched videos. The participants were 82 eighth-graders in Taiwan, and they were randomly assigned to one of three groups: a control and two experimental groups. Two language proficiency levels- low-to-medium and high- were created. One advance organizer, comprising text aids, was used in experimental group 1, whereas two advance organizers, comprising text aids and visual aids in experimental group 2 were used. The results revealed a significant difference between the three groups among participants with high English proficiency. A difference approaching significance also existed between high-proficiency participants in terms of percentage accuracy in two types of comprehension tests, one comprising general questions and the other comprising specific/inferential questions. Participants' attitudes and perceptions toward video watching and advance organizers were highly favorable. The participants in the two experimental groups experienced a lower cognitive load than did those in the control group. The findings imply that advance organizers serve as effective scaffolding, especially for middle school students who are highly proficient in listening comprehension. However, participants with low-to-medium proficiency may be initially unreceptive to the advance organizers used because they may impose an excessive cognitive load.

Key Word: advance organizers, listening comprehension, cognitive load

INTRODUCTION

Background and Motivation

Technological innovation has enabled the application of multimedia to language learning, which has brought several advantages (Hubbard, 2017; Warschauer, 1996). Authentic videos, which are widely used in English as a foreign language (EFL) classrooms (Li, 2012), supply language learners with visual and aural input, contextual texts, sounds, images, and especially the authentic language that native speakers use (Baltova, 1994; Parry & Meredith, 1984; Shin, 1998; Sueyoshi & Hardison, 2005; Wagner, 2010; Winke, Gass, & Syodorenko, 2010).

Many foreign language learners use authentic videos to enhance their listening comprehension, especially those unable to travel abroad for immersion in the target language environment (Yang, 2014) or who are seldom exposed to the target language in their daily lives. However, the fast speech rate, accents, vocabulary, syntactic structures, and background knowledge in such videos may burden the working memory and cognitive load of learners (Yang, 2014), thus hindering their listening comprehension. Some language learners have limited cognitive ability for predicting, understanding the context of, or comprehending the messages delivered in an authentic video due to insufficient linguistic proficiency or cultural background knowledge (Taylor, 2005; Teng, 2022).

An advance organizer refers to information or instructional activities that provide learners with a scaffold for linking what they are about to learn with what they have already learned (Ausubel, 1960, 2000). The term also refers to the construction of relevant information that connects prior knowledge or schema to new information; in other words, advance organizers help learners link what is already known with what is unfamiliar. Such a scaffold can reduce their cognitive load, enable their working memory to process new information more efficiently, integrate prior knowledge in their long-term memory, and contribute to enhanced listening comprehension. Advance organizers employed before viewing videos are considered a crucial aid for listening comprehension (Ambard & Ambard, 2012; Chung, 1999, 2002; Chung & Huang, 1998; Elkhafaifi, 2005; Herron, 1994; Herron, Hanley, & Cole, 1995; Herron, York, Cole, & Linden, 1998; Jafari & Hashim, 2012; Li, 2012; Li, Wu, & Lin, 2019; Teichert, 1996; Wilberschied & Berman, 2004; Yang, 2014).

Cognitive Load Theory

Cognitive load is the load generated when new information is processed in a person's capacity-limited working memory. Cognitive load theory is an instructional theory based on the knowledge of human cognition (Sweller, Ayres, & Kalyuga, 2011). Through instruction, learners acquire knowledge consciously, which requires mental effort (Sweller, 2010). Three types of cognitive load exist, namely intrinsic, extraneous, and germane cognitive load. New materials or information to be acquired by learners may generate intrinsic cognitive load. Two factors are involved in the intake of new formation causing intrinsic cognitive load: (1) the interactivity of the new information, which refers to the number of elements that must be processed simultaneously in working memory for the information to be understood (Sweller, 2011); the more interactive it is, the greater the intrinsic cognitive load it entails. (2) the second factor is the schemata or prior knowledge stored in long-term memory. Learners easily comprehend information if they have sufficient relevant schemata related to the subject matter or target problem (Moreno & Park, 2010). Extraneous cognitive load, also known as ineffective cognitive load, occurs when learners receive improper instruction (Anthony, 2008). Extraneous cognitive load can be minimized or eliminated by saving parts of the new information to be introduced later or teaching about using improved instructional designs (Moreno & Park, 2010; Sweller, 2015). Finally, germane cognitive load, also known as effective cognitive load, involves the idea that well-designed instruction focuses the working memory on schema acquisition and construction, which are considered beneficial to learning (Anthony, 2008; Sweller, 2010).

Advance Organizers

The effects of advance organizers. With applications in multimedia settings, advance organizers are considered to have several potential effects on and benefits for foreign language learning. First, advance organizers help construct learners' prior knowledge (Chung, 1999; Vandergrift, 2007; Wilberschied & Berman, 2004), activate learners' prior knowledge (Vandergrift, 2007), and enhance their listening comprehension when watching foreign-language videos (Ambard & Ambard, 2012; Herron, 1994; Li, 2012; Yang, 2014). Second, the use of advance organizers can contribute to the retention of video content (Herron, 1994; Herron et al., 1995). Third, advance organizers can help learners develop a conceptual framework

for referencing and top-down processing (Vandergrift, 2007). Lastly, cognitive load may be reduced while watching authentic videos when advance organizers are used (Yang, 2014).

Types of advance organizers used in listening comprehension. The use of advance organizers as a scaffold before viewing videos is regarded as an effective method for promoting foreign language learners' comprehension of video content (Ambard & Ambard, 2012; Chung & Huang, 1998; Chung, 1999, 2002; Elkhafaifi, 2005; Herron, 1994; Herron et al., 1995; Herron et al., 1998; Jafari & Hashim, 2012; Li, 2012; Teichert, 1996; Wilberschied & Berman, 2004; Yang, 2014) and animations (Wilberschied & Berman, 2004). Many studies on advance organizers have adopted the perspective of Ausubel (1968, 2000). Advance organizers appear in different forms, such as descriptive (Herron, 1994), visual (Li, 2012), and oral (Chung, 2002) forms. According to the instructional design employed, various other types of advance organizers exist, such as summaries and descriptions (Ambard & Ambard, 2012; Chung, 1999; Chung & Huang, 1998; Herron, 1994; Lin & Chen, 2007; Yang, 2014), questions (Elkhafaifi, 2005; Lin & Chen, 2007; Teichert, 1996), vocabulary guides list (Chung, 2002; Elkhafaifi, 2005), pictures and videos (Herron et al., 1995; Li, 2012; Wilberschied & Berman, 2004), or some combination thereof (Herron et al, 1998; Chung, 2002; Jafari & Hashim, 2012).

Several studies have demonstrated that providing summaries or brief descriptions as an advance organizer in a foreign language multimedia learning environment aids the comprehension of learners (Ambard & Ambard, 2012; Chung, 1999; Herron, 1994). Questions and vocabulary guides have also been used as advance organizers to enhance the listening skills of foreign language learners (Elkhafaifi, 2005; Herron et al., 1998; Jafari and Hashim, 2012). Visual advance organizers, such as photos or previews of parts of the video to be shown have also contributed to learners' listening comprehension (Herron et al., 1995; Li, 2012; Wilberschied & Berman, 2004). Moreover, combinations of various types of advance organizers applied to improve language learners' listening comprehension have achieved effective results (Chung, 2002; Teichert, 1996).

According to the aforementioned studies, advance organizers aid the listening comprehension of foreign language learners while watching videos; they also aid the retention of information after it is processed. However, most participants in previous studies have been college students who have effective strategies for listening comprehension and have a relatively superior knowledge of the foreign language. Few studies have revealed similar positive effects

of advance organizers among middle school students. Moreover, most studies have used only one or two types of advance organizers, such as only vocabulary lists or a combination of sentences and pictures. Few studies have demonstrated that the greater use of advance organizers result in better listening comprehension among beginner language learners. In addition, most relevant studies have utilized different types of tests to examine participants' listening comprehension, such as true/false questions, multiple-choice questions, or written descriptions. Few studies have examined the effects of advance organizers on how the learner grasps the general theme or specific pieces of information in the content and how the learner makes inferences to implicit information based on the content. Therefore, the present study aimed to fill the gaps left by relevant studies.

Question types in listening comprehension tests. Listening comprehension tests in multimedia settings have been used to examine how much participants have learned from video content during experiments. In studies that have investigated the effects of advance organizers on listening comprehension, the test formats adopted for listening comprehension tests have been written tests, true/false questions, and multiple-choice questions. Written tests have been conducted by Herron (1994), Herron et al. (1995), and Herron et al. (1998). Some written tests have been used to compose a summary of the contents of the video in the learner's first language (Li, 2012) or answer open-ended questions in the first language (Chung, 2002). The function of writing a summary and answering open-ended questions is to examine the participant's retention of the video content. Another test format has been multiple-choice questions (Chung, 1999, 2002; Li, 2012; Yang, 2014), which have been used to determine how much specific information participants obtained after watching videos. In Yang's study (2014), true/false questions were adopted to examine participants' understanding of the main ideas regarding the video content. Few studies investigating the use of advance organizers for listening comprehension have designed different question types to test participants' listening skills simultaneously in the same test formats (true/false or multiple-choice questions). Furthermore, general questions, which are used to test participants' listening skills on the global meaning of the content and specific or inferred information from it (Buck, 2001), have not yet been adopted. The combined use of general and specific questions would reveal how much the learner has mastered the information processed from listening. The present study also aimed to fill the aforementioned gaps left by relevant studies.

Statement of the Problem

Studies have demonstrated that advance organizers may facilitate foreign language learning and listening comprehension. However, these studies' participants have mainly been college students, who generally have superior language proficiency regardless of their first or foreign languages, compared with most younger learners, as well as superior cognitive strategies and more abundant background knowledge. Younger foreign language learners, such as middle school students, have seldom been included as participants in studies on listening comprehension that involve advance organizers and authentic videos.

In relevant studies, advance organizers with only one element (Chung & Huang, 1998; Herron, 1994; Jafari & Hashim, 2012) or two elements (Chung, 2002; Li, 2012; Yang, 2014; Wilberschied & Berman, 2004), such as sentences plus pictures or vocabulary plus question previews, have been applied as a scaffold for learners. Studies have seldom discussed whether having a greater number of elements in advance organizers contributes to improved performance on listening comprehension. Moreover, pictures as an advance organizer have been demonstrated to positively assist college students in listening comprehension (Herron et al., 1995; Li, 2012). Fewer studies have demonstrated such a visual aid exerted the same positive effect on middle school students of EFL. Furthermore, according to Yang (2014), students of all levels benefit from exposure to teacher-aided advance organizers; however, low-proficiency learners achieve greater overall scores than do learners of medium or high proficiency. Sweller (2005) also suggested that the effect of scaffolding declines when learners become more competent in a language; that is, scaffolding is less effective on learners with higher language proficiency. However, some studies have reported a different conclusion. For example, Lin and Chen (2007) revealed that high-proficiency students benefited more from advance organizers than did low-proficiency students. As a result, the literature still has no consensus on the effectiveness of advance organizers among students with different levels of language proficiency.

The following research questions guided the study:

1. Does the use of various advance organizers facilitate Taiwanese junior high school EFL students' listening comprehension after they have watched English videos? Is their performance affected by their English proficiency level?
2. Do any significant differences exist between the accuracy

percentages of two question types (general and specific/inferential questions) with the use of advance organizers in this study?

3. What are the participants' attitudes toward and perceptions of the use of advance organizers for videos in language learning?

METHODOLOGY

Participants

The study participants were 82 students (39 boys and 43 girls), all of whom were enrolled in the eighth grade in three intact classes (approx. 27–28 students in each class) in a junior high school located in Taiwan. The participants had an average age of 14 years and were native speakers of Chinese; furthermore, they had learned EFL for approximately five years because English is a required course, where they sat for classes at least once a week from the third grade in Taiwanese elementary schools. The participants had no experience of studying or living in any English-speaking country for longer than two weeks. Moreover, all participants gave their written informed consent prior to their participation. They were also informed that their scores on the listening comprehension tests and questionnaires in this study would not be counted toward their final score in the class.

A standardized English language proficiency test, namely the elementary-level listening General English Proficiency Test (GEPT), was used to ascertain whether the listening comprehension of these three intact classes was homogeneous. No participants self-reported having taken the same GEPT tests before. Each of these three classes were assigned to one of three groups: a control group, experimental group 1, and experimental group 2. Subjects who scored less than 15 points were classified into the low-to-medium proficiency group, and those who scored 15 points or higher were classified into high-proficiency group. The reason the participants were not divided into three subgroups of high, medium, and low proficiency in each class was because of the ubiquity of the bimodal distribution of English proficiency in junior high schools (Chen & Tsai, 2012; Teng & Fu, 2019). The students' English proficiency reached both ends of the spectrum.

Teaching Materials

The following details the two types of teaching materials used in

the study, namely English videos and advance organizers.

English video selection. To ensure the participants could learn the contents of videos that were suited to their English level, two experienced English teachers—who had each taught English for 20 years in junior high schools in Taiwan—were invited to select videos together with the researcher. Videos were selected only if they were (1) suited to the topic, (2) suited to the student's level, (3) authentic, and (4) familiar to the students.

This study first evaluated videos from three English learning magazines, which have a stringently high production value and have won awards from the Taiwanese government. The videos were rated by three experienced teachers who explained the reasons for their decisions based on the aforementioned four criteria. The raters had two weeks to evaluate the videos using a point-based system on an evaluation sheet based on the aforementioned criteria. The videos of one magazine received the highest score by the raters and were selected for use in this study.

Video length and topics. Six videos, each approximately 2–4 minutes long, were chosen. The videos were on the following six topics: a one-day city tour, classroom English, a visit to the dentist, shopping online, making complaints, and playing basketball.

Teacher-aided advance organizers. The advance organizers used in this study were group discussions, text aids, and visual aids based on the six videos. Their content was printed on worksheets that were given to the participants a week before they watched the videos, and the teacher provided instruction on the content in three class sessions prior to the video being shown.

The textual aids comprised three parts, one each on vocabulary, phrases, or sentences. The vocabulary and phrases were selected from the video scripts and listed on the worksheet, and the participants had not encountered them before, at least not in their junior high EFL textbooks (Books 1 to 3). The vocabulary listed on the worksheet was within the stipulated list of 2,000 words that junior high students in Taiwan should know. Moreover, six sentences listed on the worksheet were parts of the video scripts (English captions) and were essential for comprehending the content of the video. The six sentences were not arranged in a particular order on the worksheet. The participants were also not informed of the relationship between the six sentences and the video content.

The visual aids came in the form of six pictures, specifically six screenshots taken directly from each video and that corresponded to the six sentences in the advance organizer. These six pictures were printed in no particular order on the worksheet. In the teacher's

subsequent instruction during the experiment, the participants were asked to rearrange the order of the pictures and to match each one to one of the aforementioned six sentences with their group.

Data Collection

Listening comprehension test. The main purpose of the listening comprehension tests was to verify how much of the video content the participants comprehended rather than how much they had learned from the advance organizers (Herron, 1994). Therefore, all the questions were created based on the content of the six videos and classified into two question types, namely general and specific/inferential questions. Each test consisted of 10 questions and was composed of two sections: five true/false questions and five multiple-choice questions. Two out of five true/false questions were general questions, and two out of five multiple-choice questions were general questions. The remaining questions were specific/inferential ones. To ensure all the questions in the six listening comprehension tests were suitable for the participants, all the true/false and multiple-choice questions were examined by an experienced professor who taught TESOL in the English department of a university in Northern Taiwan and three junior high school English teachers, and the questions were revised according to their suggestions.

There are four reasons that the questionnaire used in this study were adapted from Yang (2014) and Hwang, Yang, and Wang (2013). First, the participants' language proficiency level was not the same as those in Yang (2014) or Hwang, Yang, and Wang (2013). The description of the questions in the questionnaires should match with the participants' language proficiency for this study. The participants in Yang's were all college students while the participants in Hwang's were elementary school students. The participants in this study were eighth graders in a junior high school in Yilan County, Taiwan. Therefore, the sentences in the questionnaire had to be tailored to suit to their proficiency level.

Second, the research designs of these studies were different. Some questions about subtitles were found in Yang's questionnaire, so the questions about subtitles were deleted. To understand the participants' cognitive load, one more question was added (*I would have felt more confident while viewing short videos if provided with aids, advance organizers in advance.*) in the questionnaire in my study.

Third, the description (in the Chinese version) of some questions in Hwang's questionnaire might not be easy for the participants in this study to be able to distinguish the differences or might cause

confusion for some of the participants, such as troublesome Chinese vocabulary. The wording in the questionnaire was therefore modified in this study.

Fourth, the format of the questionnaire was modified. All the questions in Yang's questionnaire were listed from 1 to 20. To make the participants in this study focus on the main idea of the questions, the questions were divided into three parts. Part A referred to the questions about video watching, Part B focused on the use of advance organizers and Part C was related to the cognitive load.

Three types of questionnaires were designed for the three groups in the study according to the different experimental treatments (see Apendices A, B, C). All the questions (English and Chinese versions) were reviewed by the aforementioned university professor. The content reliability of the questionnaires for the three groups (control group, experimental group 1, and experimental group 2) was also examined, and their Cronbach's α values were 0.737, 0.549, and 0.872.

Because the questionnaires for the three groups were different, the control group received no treatment and the questionnaire only had two parts with eight questions each, whereas the questionnaires for the two experimental groups had the same two parts plus an additional part about advance organizers. Compared with the questionnaire in experimental group 1, experimental group 2 had one more question (Question 7: The six pictures in the advance organizer are helpful in comprehending the content of a short video), which is an additional one about advance organizers in experimental group 2.

Procedure

The duration of the experiment was six weeks long in the first semester of the academic year of 2019. The junior high school the participants were from had three English class sessions and one extra flexible session in the class schedule every week. Table 1 summarizes the procedures of each group for one round of a week in the study. The teacher did not provide any activity for the control group except simply asking the participants to watch videos and then to take quizzes. Table 1 shows the differences for experimental group 1 and group 2. Experimental group 1 includes text aids while experimental group 2 both text and visual aids in their respective instructions.

Table 1

Procedures of Class Sessions of a Week in the Three Groups

4 class sessions	Control Group	Experimental Group 1 (with text aids)	Experimental Group 2 (with text aid and visual aids)
1st Session	None	1. Discussion 2. Vocabulary instruction	1. Discussion 2. Vocabulary instruction
2nd Session	None	1. Phrases instruction 2. Vocabulary review	1. Phrases instruction 2. Vocabulary review
3rd Session	None	1. Six sentences instruction 2. Vocabulary and phrases review	1. Six sentences instruction 2. Vocabulary and phrases review 3. A picture activity- in which the teacher requires students to match the screenshots taken from videos with the time sequence and the target sentences
4th Session	1.Watch a video 2.Take a quiz	1.Watch a video 2. Take a quiz	1. Watch a video 2. Take a quiz

Data Analysis

Quantitative data were collected from the scores of six sets of listening comprehension tests after video viewing. IBM SPSS 22 for Windows was used for data analysis. The data analysis methods employed for the three guiding research questions are described as follows, with each corresponding to research questions 1 to 3.

1. To detect significant differences among groups in terms of students' listening comprehension performance, a one-way analysis of variance (ANOVA) was conducted to compare listening performance among the three groups. A post hoc analysis was also used to determine which pairs of groups differed.
2. Two equations were used to calculate each participant's accuracy percentages for the two question types in the listening comprehension tests. The accuracy percentages of the six listening comprehension tests were summed to obtain a mean accuracy score (in percentage). A one-way ANOVA was then conducted to examine whether significant differences existed among the three treatments and two proficiency levels.
3. Descriptive statistics were utilized to summarize the questionnaire data.

RESULTS

Listening Comprehension Tests

A one-way ANOVA was conducted to explore whether a significant difference existed among the three groups after the treatments. Table 2 indicates that experimental group 2 performed the best in listening comprehension tests after the treatment. The results revealed that no significant difference existed among the three groups because the p value ($F = 2.44$; $p = .94$) was greater than .05. This implies that the use of advance organizers did not produce significant differences among the three groups.

Table 2

One-Way ANOVA on Listening Comprehension Tests

Group	N	M	SD	SS	df	MS	F	*P*
Control Group	27	65.6	18.2	2569.89	2	784.94	2.44	.094
Experimental Group 1	28	67.5	19.0					
Experimental Group 2	27	75.7	16.3					

A one-way ANOVA was conducted to investigate whether language proficiency affected the participants' performance under the three treatments. The participants in the three groups were divided into two proficiency levels: (1) low-to-medium and (2) high.

Table 3 showed that among participants with a low-to-medium proficiency level, those in experimental group 2 had the highest mean score (M = 63.33) and those in experimental group 1 had the lowest mean score (M = 56.03) and was worse than the control group (M = 60.00). The advance organizers used for experimental group 1 might have caused some interference in the process of learning or listening comprehension. As for the two experimental groups at the high proficiency level, they (M = 87.26, 77.44) were both superior to the control group (M = 71.67), and experimental group 2 had the highest scores. This implies that the groups with high proficiency had superior performance on the listening comprehension tests after using advance organizers.

Table 3 reveals that no significant difference existed among the three groups at the low-to-medium proficiency level ($F = .68, p = .515 > .05$). This means that no significant improvement occurred for the participants with low-to-medium proficiency with the aid of the advance organizers. The results also indicated that a significant difference existed among the three groups at the high-proficiency level ($F = 4.17$, $p = .023 < .05$), which implies that a significant difference existed in the listening comprehension performance of high-proficiency participants.

Table 3

One-Way ANOVA on Listening Comprehension Tests for Two Proficiency Levels

Proficiency	Group	N	M	SD	SM	df	SS	MS	F	*P*
Low to Medium	Control	14	60.00	16.51	4.41	2	384.05	174.03	.68	.515
	Experimental 1	13	56.03	16.37	4.54					
	Experimental 2	13	63.33	15.19	4.20					
High	Control	13	71.67	18.70	5.19	2	1690.82	845.41	4.17	.023*
	Experimental 1	15	77.44	15.57	4.02					
	Experimental 2	14	87.26	4.92	1.31					

*$p < .05$

Due to the significant differences between the two proficiency levels, a post hoc analysis was conducted to verify exactly which pairs of groups were significantly different from one another. Table 4 indicates that a significant difference existed between the control group and experimental group 2 ($p = .034 < .05$). It also reveals that a difference approaching significance existed between experimental groups 1 and 2 ($p = .096 > .05$), which means that the high-proficiency participants in experimental group 2 might have had a more significant improvement after the treatment (the advance organizer comprising text aids plus visual aids) compared with the other two groups.

Table 4

Post Hoc Analysis of Mean Scores of High-Proficiency Participants

Group	M	MD	SE	*P*
Control – Experimental 1	71.67 – 77.44	5.78	6.56	.770
Control – Experimental 2	71.67 – 87.26	15.60	5.35	.034*
Experimental 1 – Experimental 2	77.44 – 87.26	9.82	4.23	.096

*$p < .05$

Accuracy Percentages for the Two Question Types

Low-to-medium proficiency. A one-way ANOVA was conducted to explore the difference between the two question types with respect to accuracy percentage. The data in Table 5 indicates that the specific/inferential questions were more difficult than the general questions. The control group achieved the highest accuracy (69.3%), whereas experimental groups 1 and 2 had a similar accuracy (64.6% and 64.4%, respectively) for general questions.

On specific/inferential questions, experimental group 2 obtained the highest accuracy percentage (M = 59.3%) among the three groups. The accuracy percentage achieved by the control group (M = 51.9%) was very close to that in experimental group 1 (50.8%), but the control group performed slightly better. The treatment for experimental group 2 seemed to have a greater effect than that for experimental group 1 in terms of their accuracy in answers to specific/inferential questions at low-to-medium proficiency.

According to the accuracy results at low-to-medium proficiency, Table 5 reveals that no significant difference existed in the accuracy percentages of general questions ($F = .350$; $p = .707 > .05$) and specific/inferential questions ($F = 1.16$; $p = .324 > .05$). This means that the participants of low-to-medium proficiency in the three groups did not perform significantly differently when answering general or specific/inferential questions.

Table 5

One-Way ANOVA on Accuracy Percentages on Two Question Types at Low-to-Medium Proficiency

Question type	Group	N	M (%)	SD	SM	df	SS	MS	F	*P*
General	Control	14	69.3	.18	.047	2	.021	.010	.350	.707
	Experimental 1	13	64.6	.16	.044					
	Experimental 2	13	64.4	.18	.050					
Specific/ Inference	Control	14	51.9	.16	.042	2	.056	.028	1.16	.324
	Experimental 1	13	50.8	.17	.047					
	Experimental 2	13	59.3	.13	.036					

High proficiency. Table 6 reveals that experimental group 2 obtained the highest accuracy percentage (89.0%) of the three groups. The participants in experimental group 1 answered over 80% of general questions correctly (M = 82.1 %). Although the control group obtained the lowest accuracy percentage, the participants still answered three-quarters of the questions correctly (M = 75.5%).

Experimental group 2 also obtained the highest accuracy percentage on specific/inferential questions (M = 80.9%). Experimental group 1 (M = 75.1%) achieved an accuracy percentage nearly 10% higher than the control group (M = 66.4%).

According to the inferential statistics results in Table 6, a significant difference existed among the three groups on general questions ($F = 3.50$; $p = .040$); furthermore, a difference approaching significance existed among the three groups on specific/inferential questions ($F = 2.70$; $p = .080$). This means that the three groups under different treatments had significantly different performances on the two types of questions.

The results in Table 6 reveal that high-proficiency participants performed better on general questions than they did on specific/inferential questions. Furthermore, the two experimental groups performed better than the control group regardless of general

or specific/inferential questions. This means that the advance organizers had a positive effect on the listening comprehension of high-proficiency participants.

Table 6

One-Way ANOVA on Accuracy Percentages of Two Question Types at High Proficiency

Question type	Group	N	M (%)	SD	SM	df	SS	MS	F	*P*
General	Control	13	75.5	.178	.049	2	.122	.061	3.50	.040*
	Experimental 1	15	82.1	.127	.033					
	Experimental 2	14	89.0	.077	.021					
Specific/ Inference	Control	13	66.4	.202	.056	2	.144	.072	2.70	.080
	Experimental 1	15	75.1	.182	.047					
	Experimental 2	14	80.9	.082	.022					

*$p < .05$

Owing to the significant difference in accuracy percentages on general questions and an approaching significant difference in those on specific/inferential questions, a post hoc analysis was conducted to confirm exactly which pairs of groups differed significantly from one another. The post hoc analysis results in Table 7 indicate that a difference approaching significance existed between experimental group 2 and the control group in general questions (p = .066). However, no significant difference existed between the other two pairs of groups (p = .243; p = .623). Table 7 also reveals that a difference approaching significance existed between experimental group 2 and the control group on specific/inferential questions (p = .082). However, no significant difference existed between the other two pairs of groups (p = .624; p = .566).

According to the results of pairwise comparisons in Table 7, high-proficiency participants in experimental group 2 might have achieved significantly higher accuracy percentages on both question types

compared with those in the control group. That is, the advance organizer treatments had a more powerful effect on the participants in experimental group 2 than on those in the control group.

Table 7

Post Hoc Analysis on Accuracy Percentages for Two Question Types at High Proficiency

Question type	Group	M (%)	MD	SE	*P*
General	Control – Experimental 1	75.5 – 82.1	6.6	5.9	.623
	Control – Experimental 2	75.5 – 89.0	13.5	5.3	.066
	Experimental 1 – Experimental 2	82.1 – 89.0	6.9	3.9	.243
Specific/ inference	Control – Experimental 1	66.4 – 75.1	8.7	7.3	.566
	Control – Experimental 2	66.4 – 80.9	14.5	6.0	.082
	Experimental 1 – Experimental 2	75.1 – 80.9	5.8	5.2	.624

$^{*}p < .05$

Questionnaires

Participants' attitudes toward and perceptions of advance organizers. According to the results in Table 8, participants in the two experimental groups had highly favorable attitudes toward the effects of the two types of advance organizers. Participants in both experimental groups reached an agreement of over 90% regarding the text aids. Moreover, almost 90% of participants in the two experimental groups agreed that advance organizers aided their listening comprehension. Furthermore, almost 85% of participants in both experimental groups thought that the discussion with their classmates and instructor before they watched the videos helped them to link their own experience with the new information conveyed in

the video. This meant that prior discussion on the topic enabled the participants to retrieve and activate background knowledge in their long-term memory, which also contributed to improved listening comprehension. Furthermore, the participants in experimental group 2 (77.7%) had 10% higher confidence than those in experimental group 1 (67.8%) under the use of advance organizers. This finding indicates that the additional visual aids for the participants in experimental group 2 contributed to their listening comprehension and made them more confident when watching the videos. In addition, the aforementioned results also implied that fewer participants in experimental group 2 (14.8%) felt anxious when they watched the videos compared with participants in experimental group 1 (28.6%).

Table 8

Participants' Attitudes Toward Advance Organizers in Experimental Groups 1 and 2

Description of questions	Mean	Positive Attitude %	Neutral %	Negative Attitude %
I think I would perform better on listening comprehension test using advance organizers in advance than that without any aids.				
Experimental Group 1	4.25	89.3	3.6	.7.1
Experimental Group 2	4.33	88.8	0	11.1
The vocabulary, phrases and complete sentences in the advance organizer are helpful in comprehending the content of a short video.				
Experimental Group 1	4.18	92.8	0	.7.1
Experimental Group 2	4.22	92.6	0	.7.4
The discussion task in the advance organizer is useful to link the content of video with your personal life experience.				
Experimental Group 1	3.86	85.7	0	.14.3
Experimental Group 2	4.00	85.2	7.4	7.4
I would feel more confident while viewing authentic video if provided the aids, advance organizers, in advance.				
Experimental Group 1	3.57	67.8	3.6	28.6
Experimental Group 2	3.93	77.7	7.4	14.8

Participants' cognitive load in the three groups. Table 9 reveals a trend where experimental group 2 had the lowest cognitive load among the three groups while the control group had the highest cognitive load because they were not assisted by any advance organizers.

Table 9

Percentage of Negative Attitudes Toward Cognitive Load Among the Three Groups

Description of questions	Negative Attitudes		
	Control Group (%)	Experimental Group 1 (%)	Experimental Group 2 (%)
I need to put lots of effort while comprehending the contents of the video.	33.3	57.2	77.7
It is difficult for me to comprehend the contents of the video.	40.7	67.9	81.4
I need to put lots of effort into answering the questions in the listening comprehension test.	40.7	53.6	70.3
I feel frustrated and found it difficult answering the questions in the listening comprehension test.	22.2	53.6	62.9

DISCUSSION

Effect of Advance Organizers on Listening Comprehension

The first research question was as follows: Does the use of advance organizers facilitate Taiwanese junior high school students' listening comprehension after they have watched English videos? Is their performance affected by their English proficiency levels? The

inferential statistics results revealed that the three groups did not significantly differ (F = 2.44; p =.094). This meant that the use of advance organizers before watching the videos did not lead to significant improvements in listening comprehension. The findings of this study are inconsistent with the findings of Ambard and Ambard (2012), Chung (1999, 2002), Elkhafaifi (2005), Herron (1994), Herron et al. (1995), Herron et al. (1998), Jafari and Hashim (2012), Li (2012), and Teichert (1996). This is probably because all participants in these studies have been college students, who would have been learning the second language for years and would possess more strategies for listening comprehension than the younger learners in this study. College students have relatively greater linguistic knowledge, which helps them comprehend the videos, and tend to use bottom-up strategies to focus on every piece of linguistic input (Brownell, 2016; Morley, 2001).

However, the results differed when the participants were segmented by language proficiency. The three groups significantly differed when high and low-to-medium proficiency students were analyzed. The findings suggest that the participants with high proficiency in experimental group 2 outperformed those in the control group. Although experimental group 1 performed better in terms of mean scores than did the control group, no significant difference existed. This accords with Ausubel's (2000) theory of meaningful learning. For participants with high language proficiency, advance organizers acted as a scaffold, transferring contents into meaningful learning before they were stored in participants' long-term memory along with their prior knowledge. While audio-visual messages were simultaneously processed during listening comprehension, prior knowledge was immediately activated, retained, and successfully integrated with the new messages in their working memory, resulting in greater comprehension (Chung, 1999; Mayer & Moreno, 2010; Vandergrift, 2007; Wilberschied & Berman, 2004).

Accuracy Percentages of Two Question Types

The second research question was as follows: Do any significant differences exist between accuracy percentages of the two question types (general and specific/inferential questions) under the treatment of advance organizers in this study? The results revealed that the accuracy percentages of general questions were higher than those of specific/inferential questions among the three groups for both proficiency levels. This implies that advance organizers were more effective at facilitating learners in obtaining a general idea of the

video content than in making inferences or acquiring specific information. This finding is consistent with the findings of Yang (2014) and Mayer (2002), whose studies reported that the scores for general questions were higher than those for specific/inferential questions. The combined advance organizers in this study comprised the same textual aids: vocabulary guides, phrases, and six complete sentences, which may explain why the participants of two proficiency levels obtained higher accuracy percentages on general questions.

However, this study found that these text aids did not work well for participants with low-to-medium proficiency. This may be because participants with low-to-medium proficiency could not absorb as many text aids in such short class sessions. Another explanation lies in these learners' cognitive load when advance organizers were administered to them. The intrinsic and extraneous cognitive loads were high for participants of low-to-medium proficiency when they received three highly related and different linguistic levels of textual aids and guides to vocabulary, phrases, and sentences simultaneously in a short session (Sweller, 2011, 2015). This was a possible reason why the mean accuracy percentage of specific/inferential questions among the participants with low-to-medium proficiency in experimental group 1 were not higher than their control-group counterparts.

Furthermore, this study found that experimental group 2 outperformed experimental group 1 at both proficiency levels in mean scores on the listening comprehension tests. The additional pictures provided powerful contextual support for facilitating listening comprehension. Pictures have been viewed as useful prior visual support for facilitating students' reading and listening comprehension in foreign languages (Curtain & Dahlberg, 2004; Herron, 1994; Yoshii & Flaitz, 2002). Some studies have also found that visual-aid advance organizers are more effective than vocabulary guides, question previews, and verbal descriptions (Dahany, 1985; Herron et al., 1998). This implies that pictures help highly proficient learners answer both general and specific/inferential questions. We also found that the participants with low-to-medium proficiency in experimental group 2 outperformed their counterparts in experimental group 1 on specific/inferential questions. It seems that the visual aids compensated for the lack of prior linguistic knowledge in participants with low-to-medium proficiency. This is in line with the finding of Wilberschied and Berman (2004), who suggested that listeners with lower language proficiency significantly benefited from the use of pictures in advance organizers.

A significant difference in accuracy percentage existed for general

questions, as did a difference approaching significance on specific/inferential questions among the three groups at high proficiency. This may be because combined advance organizers had a more powerful effect on the listening comprehension of highly proficient participants in this study. This indicates that advance organizers help learners retain the information in a video (Herron, 1994; Herron et al., 1995) and develop a conceptual framework for referencing and top-down processing (Vandergrift, 2007). From a linguistic perspective, highly proficient learners have better listening comprehension because they already have better knowledge of grammar and vocabulary (Vandergrift & Baker, 2015; Van Zeeland & Schmitt, 2013).

Attitudes Toward and Perceptions of Advance Organizers and Video Watching

The third research question was as follows: What are the participants' attitudes toward and perceptions of the use of advance organizers for videos in language learning? The participants expressed positive attitudes toward the use of advance organizers for listening comprehension, which accords with the findings of Ambard and Ambard (2012), Chung (2002), and Yang (2014). This suggests that advance organizers in textual form offered a good scaffolding of linguistic knowledge for the participants in the experimental groups, especially among highly proficient learners.

Many (>60%) participants in experimental group 2 expressed approval on the six pictures that constituted the visual advance organizer. This is consistent with the findings of Wilberschied and Berman (2004), who reported that up to 90% of their participants thought that pictures were the most helpful advance organizers. The instruction provided with the six pictures also explains such a high level of approval. The participants in experimental group 2 were asked to discuss in groups, match the six sentences with the six pictures, and arrange the screenshots in the right order according to what they think the plot of the video was. This process made the participants more sensitive to remembering other parts of the plot and linking them together meaningfully (Li, 2012).

Third, the results revealed that the control group had the highest cognitive load. The findings implied that the two experimental groups exposed to advance organizers experienced obviously lower cognitive loads than the control group. This is consistent with the findings of Yang (2014), who suggested that advance organizers can reduce listeners' cognitive load (Ambard & Ambard, 2012; Chung,

2002; Yang, 2014).

In fact, advance organizers are not necessarily effective for every learner (Herron et al., 1998). In this study, the same textual advance organizers might have imposed a higher cognitive load on less proficient learners than on highly proficient learners. While audio and visual messages were simultaneously being processed in the participants' working memory, their total cognitive load could have exceeded the overall capacity of their working memory (Moreno & Park, 2010; Sweller, 2015), interfered with the comprehension process, and thus reduced comprehension.

CONCLUSION

This study explored the effects of advance organizers on listening comprehension when used alongside authentic videos in learning. With language proficiency level accounted for, this study's analysis revealed a significant difference among highly proficient participants in the three groups. In terms of accuracy percentages on the two question types, advance organizers improved the ability to answer general questions more than it did for specific/inferential questions. The pictures in advance organizers may be effective in improving the listening comprehension of participants of both proficiency levels. The use of advance organizers was perceived very favorably by participants in the experimental groups.

Pedagogical Implications

Although the advance organizers in this study were shown to be helpful for listening comprehension only for highly proficient learners, English language teachers are recommended to apply advance organizers to facilitate learners' listening comprehension, with proper revisions if necessary. Moreover, language learners can be divided into groups based on their listening-comprehension proficiency and be offered videos or advance organizers tailored to their level, if logistical circumstances (in money, availability of teachers, and support from both educational authorities and students' parents or caregivers) permit. In particular, tailored advance organizers offer better scaffolding.

Methodological Limitations and Suggestions for Future Research

Although the present study yielded some findings that have both

theoretical and practical implications, the research design is not without flaws. The first limitation is the generalizability of the experiment. The second major limitation is the duration of experiments. The entire experiment in this study only lasted for 6 weeks. Although the scaffold was explained orally by the instructor, some of the participants may not have been able to internalize what they had learned in such a short number of sessions. Third, to test the effectiveness of advance organizers, videos of diverse genres should be employed, and they should feature topics that participants are not often exposed to, such as those related to education, science, art, and engineering. As for the suggestion of future research, firstly, a larger-scale and longitudinal research will definitely enhance the generalizability of findings. Second, the implementation of advance organizers should be designed for different proficiency levels. Third, the duration of the experiment should be extended. Fourth, different genres of videos could be used to test the effects of advance organizers. Thus, further analysis may be conducted to help clarify which combinations of advance organizers have significant effects on listening comprehension for which proficiency levels. Such future studies will further the contributions of this study to language pedagogy, especially in listening comprehension.

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APPENDIX

Appendix A. Questionnaire for Control Group

Part A: (About videos)
1. I think it is helpful for me to have English listening drills by watching short videos.
☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

2. I love to have English listening drills by watching short videos.
☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

3. I think it is helpful to comprehend the content of the video by watching it more than one time.
☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

4. Which makes it difficult for me to comprehend the content of the short video? (You can choose more than one reason or write down other reason not listed on the sheet)
☐ Topic ☐ Vocabulary ☐ Speed rate ☐ Other：_____

Part B: (Cognitive Load)
5. It is difficult for me to comprehend the content of the short video. (Mental Load)
☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

6. I felt frustrated and found it difficult answering the questions in the listening comprehension test. (Mental Load)
☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree
7. I need to put lots of effort into answering the questions in the

listening comprehension test. (Mental Load)

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

8. I need to put lots of effort while comprehending the content of the short video. (Mental Efforts)

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

Appendix B. Questionnaire for Experimental Group 1

ID: Name:

Part A: (About videos)

1. I think it is helpful for me to have English listening drills by watching short videos.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

2. I love to have English listening drills by watching short videos.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

3. I think it is helpful to comprehend the content of the video by watching it more than one time.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

4. Which makes it difficult for me to comprehend the content of the short video? (You can choose more than one reason or write down other reason not listed on the sheet)

☐ Topic ☐ Vocabulary ☐ Speed rate ☐ Other：_____

Part B: (about Advance Organizer, text aids)

5. The discussion task in the advance organizer is useful to link the content of a short video with your personal life experience.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

6. The vocabulary, phrases and complete sentences in the advance organizer are helpful on comprehending the content of a short video.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

7. I would felt more confident while viewing short videos if provided the aids, advance organizers, in advance.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

8. I think I would perform better on listening comprehension test under the circumstances of advance organizers in advance than that without any aids.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

9. You still have trouble in comprehending all the content of a short video even if provided with advance organizers. What are the possible factors for you?

☐ Lack of background knowledge ☐ Unfamiliar Vocabulary
☐ High speed rate ☐ Overload content
☐ Others：_____

Part C: (Cognitive Load)

10. It is difficult for me to comprehend the content of the short video. (Mental Load)

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

11. I felt frustrated and found it difficult answering the questions in the listening comprehension test. (Mental Load)

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

12. I need to put lots of effort into answering the questions in the listening comprehension test. (Mental Load)

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

13. I need to put lots of effort while comprehending the content of the short video. (Mental Efforts)

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

Appendix C. Questionnaire for Experimental Group 2

ID: Name:

Part A: (About videos)

1. I think it is helpful for me to have English listening drills by watching short videos.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

2. I love to have English listening drills by watching short videos.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

3. I think it is helpful to comprehend the content of the video by watching it more than one time.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

4. Which makes it difficult for me to comprehend the content of the short video? (You can choose more than one reason or write down other reason not listed on the sheet)

☐ Topic ☐ Vocabulary ☐ Speed rate ☐ Other：_____

Part B: (about Advance Organizer, text aids plus visual aids)

5. The discussion task in the advance organizer is useful to link the content of a short video with your personal life experience.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

6. The vocabulary, phrases and complete sentences in the advance organizer are helpful in comprehending the content of a short video.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

7. The six pictures in the advance organizer are helpful in comprehending the content of a short video.
☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

8. I would felt more confident while viewing short videos if provided the aids, advance organizers, in advance.
☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

9. I think I would perform better on a listening comprehension test under the circumstances of advance organizers in advance than that without any aids.
☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

10. You still have trouble in comprehending all the content of a short video even if provided with advance organizers. What are the possible factors for you?
☐ Lack of background knowledge ☐ Unfamiliar Vocabulary
☐ High speed rate ☐ Overload content
☐ Others：_____

Part C: (Cognitive Load)
11. It is difficult for me to comprehend the content of the short video. (Mental Load)
☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

12. I felt frustrated and found it difficult answering the questions in the listening comprehension test. (Mental Load)
☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

13. I need to put lots of effort into answering the questions in the listening comprehension test. (Mental Load)

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

14. I need to put lots of effort while comprehending the content of the short video. (Mental Efforts)

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree
☐ Strongly disagree

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