The Effects of Advance Organizers and Subtitles on EFL Learners' Listening Comprehension Skills

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ABSTRACT

The present research reports the findings of three experiments which explore how subtitles and advance organizers affect English as a foreign language (EFL) learners' listening comprehension of authentic videos. The EFL learners in this study were randomly assigned to one of two groups. The control group received no treatment and the experimental group received treatment with the experimental conditions of which comprised several types of scaffolds—subtitles, unaided advance organizers and teacher-guided advance organizers. The results show that the presence of subtitles and advance organizers assisted EFL learners' listening comprehension of CNN news reports. However, there was no significant relationship between English proficiency and the experimental conditions. All of the students benefited from the scaffolding regardless of proficiency level. The students' attitudes toward the specific type of scaffolding were also probed and the reasons for their preferences for one type of scaffold over another are also explained.

KEYWORDS

Dual Coding Theory, Cognitive Load Theory, Scaffold, Advance Organizer, Subtitles

INTRODUCTION

Using videos is an interesting way to assist EFL learners in learning English. Conversations found in videos, as spoken by native speakers, provide students with authentic materials with which to learn foreign languages (Buck, 2001; Richards & Rodgers, 2001; Rost, 1990). Real-life spoken texts delivered by native speakers are spoken only once; these spoken texts are generally not repeated unless they are recorded for a particular purpose. Recorded exchanges in the target language provide EFL students the opportunity to practice listening comprehension with infinite repetitions and reviews. EFL learners may listen to and comprehend audio-visual input transmitted from multimedia sources. Students may also be introduced to a completely new learning environment through the provision of learning aids (Herron, 1994). These learning aids may take the form of either subtitles or advance organizers that can act as scaffolding when EFL learners watch

authentic videos for listening comprehension practice. The present study compares three types of scaffolding used in teaching EFL listening comprehension — (a) subtitles, (b) un-aided advance organizers, and (c) teacher-guided advance organizers. The study is unique because the students could watch the videos only once.

Students in the present study received dual codes (visual and verbal codes) from the authentic English language videos they viewed. The rapid delivery rate and transient nature of these authentic videos imposed a significant cognitive load on the learners in this study. Thus, it is assumed that the addition of subtitles and advance organizers embedded within these videos would reduce their cognitive load (Garza, 1991; Vanderplank, 1988) and enhance their overall listening comprehension.

This study also examines the students' attitudes toward the three forms of scaffolding provided and probes the reasons why some students prefer certain types of scaffolding over others. This article specifically expands upon research previously conducted on second language (L2) listening in a multimedia environment with the aim of addressing how different types of scaffolding affect the listening comprehension of students of varying English proficiency levels.

THEORETICAL FRAMEWORK

Working Memory

Working memory consists of one central system — the central executive — and two subsystems — the phonological loop and the visual-spatial sketchpad (Baddeley, 2007). The central executive system is used to select relevant information, suppress irrelevant information, and coordinate cognitive processes in the two subsystems whenever tasking occurs simultaneously. The phonological loop deals with phonological input and prevents its decay through sub-vocal articulation. Sub-vocal articulation is used to recode visual material and integrate it into the phonological store (Baddeley, 2007). The visual-spatial sketchpad stores visual-spatial information by constructing, manipulating, and representing visual images as mental maps. This mindscape can be further divided into a visual subsystem (color, shape, and texture) and a spatial subsystem (location). An episodic buffer serves as an interface between these three working-memory subsystems and one's long-term memory. It allows perceptual information, subsystem information, and long-term memory to be integrated into a limited number of manageable episodes. The episodic buffer creates an interface between the different codes — visual, verbal, and perceptual — and long-term memory for purposes of learning and retrieval (Baddeley, 2007).

Dual Coding Theory

Visual and auditory inputs are first processed in the learner's working memory. The human cognitive system, with its limited capacity, cannot be alerted to all input, but rather selects key parts of auditory/visual messages by focusing on only the most relevant information. These visual and auditory messages constitute the dual codes involved in sensory reception. The dual codes include both verbal codes (i.e., *logogens*) and non-verbal codes (i.e.,

imagens) (Clark & Paivio, 1991). The interaction that occurs within the verbal and/or non-verbal system is known as the associative connection, while the interaction between the verbal and the non-verbal system is called the referential connection (Clark & Paivio, 1991). The eyes receive recorded visual input in the form of graphic illustrations, animations, videos, and screen texts. The ears receive sensory input in the form of verbal narration or through nonverbal sound cues. Visual channels process graphic material, and auditory channels process verbal material, according to Paivio's dual coding theory (Clark & Paivio, 1991; Mayer, 2009). This dual coding theory can be applied to a multimedia learning context (Mayer & Moreno, 2010). In a multimedia learning environment, the display model can be realized as pictures plus narration, pictures plus text plus narration, or simulation or interactive games (Mayer, 2009). Learning occurs better through the employment of dual codes than by either one's visual or verbal code alone (Mayer, 2009; Jones, 2009).

Cognitive Load Theory

Based on the cognitive theory of multimedia learning, the initial learning process involves five steps: (a) selection of relevant words to process into working memory; (b) selection of relevant images to process into working memory; (c) organization of selected words; (d) organization of selected images; and (e) integration of visual and auditory information with prior knowledge (Horz & Schnotz, 2010; Mayer, 2009). Learners may activate the knowledge to be retrieved in long-term memory and then process the information in their working memory. This process establishes a link between the incoming message and prior knowledge. If the message is further explained with illustrations, comprehension and retention of the message may be enhanced. However, there are also some impediments to learning that can have a direct effect on comprehension.

Three types of cognitive load may obstruct learning: (a) extraneous, (b) intrinsic, and (c) germane. Extraneous cognitive load is caused by poor instructional design (Mayer, 2009; Mayer & Moreno, 2010; Moreno & Mayer, 2010; Moreno & Park, 2010) and can be minimized by improving instructional design (Moreno & Park, 2010). Intrinsic load is caused by the relative complexity of the learning material (Mayer, 2009; Mayer & Moreno, 2010). Thus, learners must possess sufficient background knowledge for text comprehension to occur (Moreno & Park, 2010). If the intrinsic load is light, a heavy extraneous load will not negatively affect learning. If the intrinsic load is too heavy, the addition of a heavy extraneous load will exceed the learner's working memory capacity. A variety of ways have been suggested to reduce the intrinsic load, including pre-training, sequencing, and chunking, to name a few (Mayer, 2005; Mayer & Moreno, 2010; Moreno & Park, 2010). Germane load is caused by expending cognitive resources on schema acquisition and schema activation (Moreno & Park, 2010; Mayer & Moreno, 2010; Moreno & Mayer, 2010). Working memory capacity is limited, so if input is transmitted simultaneously via several channels, it will overload a learner's memory capacity and negatively affect comprehension. Thus, the overall cognitive load cannot exceed overall working memory capacity (Moreno & Park, 2010).

The present study applies the cognitive theories of multimedia learning, working memory, dual coding, and cognitive load in explaining how subtitles and advance

organizers affect EFL learners' listening comprehension of authentic videos. The theories relevant to the present research are summarized in Table 1.

Table 1
Theories Related to the Present Research

Theory	Application in the present study
Working memory (Baddeley, 2007)	The verbal and visual codes transmitted through videos are processed in EFL learners' working memory.
Dual coding (Clark & Paivio, 1991)	EFL learners receive visual and verbal codes from videos.
Cognitive load (Mayer, 2009)	The presence of subtitles and advance organizers reduce EFL learners' cognitive load and facilitate a more manageable load.

The Effects of Movie Subtitles on Video Viewing

The visual aids, sound, dialogue, action, and plots in videos can all engage students in a way that can improve their foreign language listening ability. However, the rapid delivery rate, unfamiliar vocabulary, and foreign accents found in authentic videos often frustrate foreign language learners by placing on them a significant cognitive load. The addition of subtitles may reduce L2 learners' anxiety while watching authentic videos (Vanderplank, 1988). The addition of subtitles to videos has been shown to enhance L2 learners' listening comprehension (Garza, 1991; Guillory, 1998; Markham, Peter, & McCarthy, 2001; Markham & Peter, 2002-2003) and vocabulary learning (Markham, 1999; Neuman & Koskinen, 1992).

Vanderplank (1988) investigated European and Arabic students' listening comprehension of videos by asking students to watch BBC English-language video programming containing subtitles one hour every week for a period of nine weeks. The results revealed the positive effects of subtitles. Markham (1999) examined the effects of video captioning and also found that learners who watched videos with captions outperformed those who were not provided with captions on similar listening word recognition tests. Markham, Peter, & McCarthy (2001) further examined the effects of subtitles on native English speakers learning Spanish as a foreign language. They found that both the English- and Spanish-subtitle groups outperformed the non-subtitles group on both written summary and multiple-choice tests. Similarly, the control group in this study could not produce as many meaningful units as could those in the English-subtitle group. Neuman & Koskinen (1992) studied the effects of captions on vocabulary and concept learning among seventh and eighth graders. Students in the captioned TV group outperformed the other groups which were not provided with captions in vocabulary and written recall tests. In this study, the high proficiency learners learned more words from captioning than low proficiency learners. Winke, Gass, and Sydorenko (2010) examined the effects of captioning order, target language, and language proficiency on

comprehension of videos. Those who were exposed to captions twice outperformed those who had no access to captioning on vocabulary and comprehension tests. Other researchers (e.g., Guichon & McLornan, 2008; Huang & Eskey, 1999-2000; Markham & Peter, 2002-2003; Stewart & Pertusa, 2004; Sydorenko, 2010) have found that captioned videos can be used to facilitate students' global comprehension, plot recall, and vocabulary learning. The above research studies tend to indicate that the addition of subtitles to videos do not increase foreign language learners' cognitive load, but rather facilitate comprehension (Garza, 1991; Vanderplank, 1988). However, in a study by Guillory (1998), foreign language learners felt that full captioning distracted their attention, preferring instead only key word captions in videos. Also, if the delivery rate was rapid, the students reported that they had no time to read the full captions, and sometimes were unable to read the subtitles at all. Key word captions may have had similar effects as full captions did. Previous research has consistently shown that students seem to learn better when they can see subtitles while watching authentic videos. However, advance organizers can also be used to enhance listening comprehension when viewing videos.

The Effects of Advance Organizers on Viewing Videos

Advance organizers (AO) can further mitigate a learner's cognitive load. An advance organizer (AO) may contain a higher level of abstraction, generality, and inclusiveness than that which is in the target learning material (Ausubel, 1968). The function of an advance organizer is to serve as a scaffold that may increase the discriminability factor between the upcoming learning material and relevant ideas located in a cognitive structure (Ausubel, 2000). Advance organizers (AO) are used to activate prior knowledge and then bridge the gap between new information and established knowledge (Ausubel, 1968; Plass, 1998). Advance organizers must be learnable, and, if used appropriately, they can positively influence learning outcomes.

The range of the advance organizers is broad, and includes graphic organizers (Simmons, Graffin, & Kaneehui, 1988), visual organizers, text organizers (Merkt, Weigand, Heier, & Schwan, 2011), and oral organizers (Chung & Huang, 1998). Advance organizers can be in the form of questions (Elkhafaifi, 2005; Herron, York, Cole, & Linden, 1998; Lin & Chen, 2006, 2007; Lin, Dwyer, & Swain, 2006; Lin, Kidwai, Munuofi, Ausman, & Dwyer, 2005), descriptions (Herron et al., 1995; Herron et al., 1998; Lin & Chen, 2006, 2007; Lin, Dwyer, & Swain, 2006; Lin et al., 2005), vocabulary (Elkhafaifi, 2005), pictures/graphs (Herron et al., 1995; Wilberschied & Berman, 2004), or a combination of descriptions and pictures (Herron et al., 1995).

Presenting advance organizers prior to video viewing is widely seen as an effective way to help foreign language learners understand the content in videos (Ambard & Ambard, 2012; Elkhafaifi, 2005; Hanley, Herron, & Cole, 1995; Herron, 1994; Herron et al., 1998; Teichert, 1996; Wilberschied & Berman, 2004) or animation (Lin & Chen, 2006, 2007).

Herron (1994) investigated the effects of advance organizers on beginning French as a foreign language learners' listening comprehension ability. The results showed that the advance organizer group outperformed the control group in listening comprehension and on plot recall after viewing ten videos. Herron, York, Cole, and Linden (1998) also studied

the effects of advance organizers on beginning French learners' comprehension of the videos. The groups included one given descriptive AOs, another given question AOs, and a control group. The performance of those in the group given question AOs, contrary to the authors' hypothesis, were not better than that of those in the group given descriptive AOs. However, the results indicated that learners who were given advance organizers outperformed those who were not given advance organizers on the comprehension tests. Providing learners with relevant introductory materials before watching authentic videos is considered to be more effective than not providing anything at all. Teichert (1996) employed illustrations, brainstorming, and questions as advance organizers in assisting intermediate college German language learners. The experimental groups (i.e. those provided with the AOs) were also allowed to use the language laboratory to watch the video segments as often as they liked. The subjects in the control group were given no AOs and had no access to the video segments. The results showed that the experimental groups, benefited by the assistance of audio and video input along with advance organizers and repeated video viewings, outperformed the control group on the post-tests. Wilberschied and Berman (2004) provided Chinese language learners with written messages and sentences summarizing the videos while providing another group of students with the same written texts and photos of the videos. The video summaries and relevant photos helped improve the learners' comprehension of the videos. Elkhafaifi (2005) investigated the effects of vocabulary and question previewing on intermediate level Arabic learners of English and found that the group that previewed vocabulary and the question previewing group significantly outperformed the distractor group. Previewing was also beneficial with regard to the learners' comprehension of the videos. Lin and Chen (2006, 2007) investigated the effects of two types of advance organizers accompanied with animation of a human heart and found that the question AOs were more effective than the descriptive AOs in terms of comprehension. The question AO group outscored the static visual group on the delayed tests. Moreover, the AO groups performed better on delayed tests than the other groups did. Michel and Roebers (2008) examined the effects of three types of advance organizers on children's comprehension of an educational film about a sugar refinery. The children were divided into four groups: (a) preview, (b) inserted summary, (c) audio preview, and (d) control. They found that the children in both the preview and the inserted summary groups significantly outperformed the other two groups on free recall questions and on a recognition test. The finding that audio-preview was not effective was likely due to the fact that there were no images for the children to rely on. The children had difficulty with recalling the plots. The 8-year-old children outperformed the 6-year-old children. These results imply that visual-verbal redundant information is beneficial for children's comprehension and recall ability. Ambard and Ambard (2012) found that the effects of advance organizers on advanced–beginner Spanish college students divided into three conditions: (a) AO group reading, (b) AO quiet reading, and (c) a control group given no AOs. The results also showed that the experimental groups that were given advance organizers outperformed the control group on the comprehension tests. Providing the students with introductory materials or a familiar related topic helped them better comprehend the videos. The learners also expressed positive attitudes regarding the advance organizers. To sum up the results of the above studies, most of them show that advance organizers are beneficial when it comes to listening comprehension of videos.

STATEMENT OF THE PROBLEM

Previous studies have demonstrated that subtitled authentic videos can help learners improve listening comprehension and vocabulary. Other studies have shown that advance organizers may also facilitate students' foreign language learning. However, an over-reliance upon subtitles may occur (Winke et al., 2010) whereby students spend too much time reading subtitles due to personal preference or out of habit (Grgurovic & Hegelheimer, 2007). This undoubtedly leads to students to ignore key elements in audio-visual input. In EFL learning situations, advance organizers may be used instead of subtitles as a way to help EFL learners pay more attention to the audio-visual input. It is thought that when students read less, they listen more (Guillory, 1998). Additionally, based on the expertise reversal effect (Sweller, 2005), the effects of scaffolding gradually decrease as students' English abilities improve. Thus, scaffolding is deemed less effective for high proficiency learners. Some studies have found that intermediate and advanced learners benefit more from subtitles (Borrás & Lafayette, 1994; Neuman & Koskinen 1992; Taylor, 2005; Vanderplank, 1988) or advance organizers (Lin & Chen, 2007; Lin, Ching, Hsu, & Dwyer, 2010). Winke, Gass, and Sydorenko (2010) found that all students benefited from subtitles regardless of proficiency level. The relevant studies about scaffold and beneficiary i.e. which level of student benefits more from scaffolding (see Table 2), remains inconclusive. If the participants are Taiwanese English learners, then English proficiency plays a crucial role in their learning results. The relationship between English proficiency levels and subtitles or between English proficiency levels and advance organizers has been minimally discussed in the past. Finally, students' attitudes towards subtitles and advance organizers have also been seldom addressed in previous research studies.

Table 2
Summary of Scaffold and the Language Studied in Previous Researches

Author	Year	Scaffold	Video content	Target language	Grade/proficiency level
Winke, Gass, & Sydorenko	2010	captions	salmon, bears, & dolphins	English	all levels
Markham & Peter	2002-2003	captions	Movie (Apollo 13)	Spanish	freshmen & sophomore > juniors, seniors & graduates
Markham	1993	captions	TV	English	intermediate or advanced learners > beginners
Taylor	2005	captions	history & food	Spanish	third & fourth > first year learners

Borrás & Lafayette	1994	captions	courseware	French	mid and high achievers > low achievers
Neuman & Koskinen	1992	captions	science	English	high proficiency > low proficiency
Vanderplank	1988	captions	BBC news	English	intermediate or advanced > low
Chang, Tseng, & Tseng	2011	captions	San Diego Zoo	English	High proficiency > low proficiency
Lin, Ching, Hsu, & Dwyer	2010	AO	animation	English	high prior knowledge > low prior knowledge
Lin & Chen	2007	AO	animation	English	High proficiency > low proficiency
Michel & Roebers	2008	AO	educational film	English	8-year-old > 6-year-old

To address the questions above, the research questions in the present study are as follows:

1. Do students perform differently on listening comprehension tests under English-subtitled and non-subtitled conditions, and is there a relationship between students' English proficiency level and the comprehension test scores?
2. Do students perform differently on listening comprehension tests depending on whether they are exposed to unaided advance organizers or not, and is there a relationship between students' English proficiency level and the unaided advance organizer condition on listening comprehension tests?
3. Do students perform differently on listening comprehension tests depending on whether they are exposed to teacher-aided advance organizers or not, and is there a relationship between students' English levels and aided advance organizer condition on listening comprehension tests?
4. What are the students' attitudes toward subtitles and advance organizers?

METHOD

Participants

The participants' English proficiency levels prior to conducting this study were assessed by the GEPT[1] intermediate listening test (equivalent to a score of between 29-47 on the TOEFL iBT). There were a total of 71 students (Male=17, Female=54) with an average age of 26 (Mean= 25.6, SD=6.7) who participated in the study. An independent sample t-test was used to analyze two groups of students with no significant differences, t(69)=-1.328, p

>.05. The top 30% were classified as high proficiency learners. The bottom 30% were classified as low proficiency learners. High, mid-, and low proficiency learners were randomly distributed in two groups. The experimental group was made up of seniors studying in a two-year senior college program[2]. The control group was comprised of seniors studying in a four-year junior college program. The students were enrolled in an extended education program in an Applied English Department at a science and technology university in southern Taiwan.

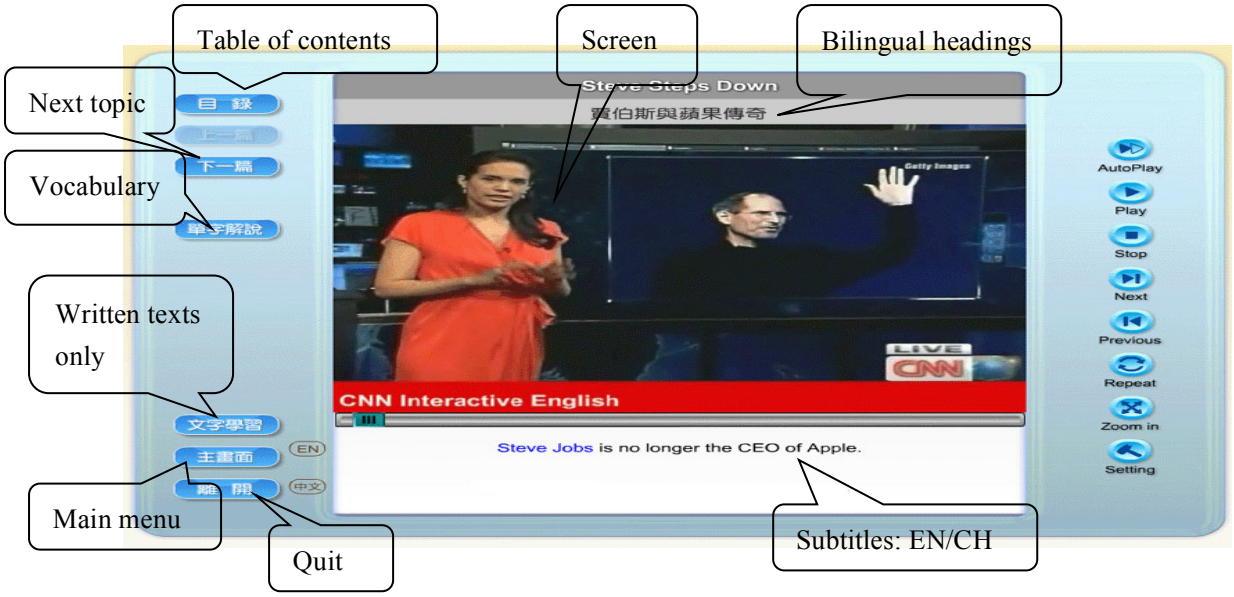
The Videos Used in the Experiments

To ensure internal validity, the students were first asked whether they had heard of the book *Master Listening with CNN News*. None of the students were familiar with the book or the CD-ROM before at the time the study commenced. Thus, it was determined that the contents of the video clips were suitable to the present study.

Three experiments were included in the present study utilizing video clips from CNN news broadcasts (equivalent to a score of 57-82 on theTOEFL iBT). The spoken language on the news was authentic and each video segment lasted for only 3-5 minutes. A sample screenshot of the video is shown in Figure 1. In all three experiments, a total of nine video clips were used. The topics in the video clips included astrology, geography, technology, commerce, and environmental protection. All these topics were deemed relevant to the students' daily lives due to their frequency in the media.

Figure 1

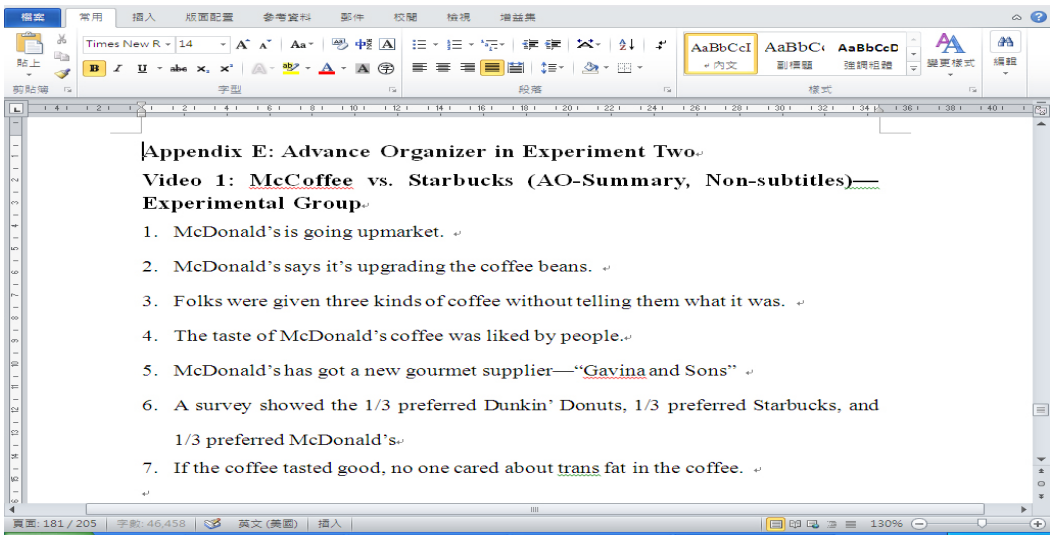
Screenshot of a Video Used in the Study



In the first experiment, the experimental group was exposed to English subtitles while the control group was not shown any subtitles. In the second and third experiments, advance organizers were used. The only advance organizer used was a summary of the news broadcasts. The students were divided into two groups: AO-summary and Non-AO.

In the second and third experiments, the experimental group was exposed to the AO-summary (Figure 2) consisting of 5-7 sentences selected from each video segment. The sentences were presented in chronological order, introduced the key points of the video, and were displayed on each student's computer screen. In experiment two, the researcher did not explain the advance organizers to students. However, the students were allowed to check a dictionary while reading the advance organizers. The experimental group read advance organizers silently (Ambard & Ambard, 2012) without their peers' assistance or the teacher's explanation. The control group read nothing before watching the broadcast. In the third experiment, the researcher read aloud the advance organizers and also used the students' mother language (i.e. Mandarin Chinese) to briefly introduce the video. The advance organizers were displayed on each student's computer screen. After the students read over the advance organizers, they were shown the news broadcast. Students in the control group did not read any advance organizers, nor did they receive any peer help or teacher explanation before viewing the news broadcast.

Figure 2
Screenshot of AO-summary



Procedures

The experiments were conducted in a language laboratory containing 49 computer monitors for students and a computerized control panel system from which the teacher could monitor each student. Thus, students could individually access their own computer. The researcher sat at the front of the language laboratory and managed the central system to control the volume, DVD player, and the presentation modes of the videos, as well as turn on/off the students' computer monitors. The sound was played through four speakers (two in front and two at the back of the laboratory), ensuring that the sound was loud enough for everyone to hear clearly. The overall system was controlled by the researcher, not by the students individually.

After the students sat at a computer station, the researcher gave them instructions regarding: (a) information pertaining to the videos; (b) how to answer the test items; and

(c) what they were and were not allowed to do during the tests. Each video segment was played once only. The students were then administered the comprehension test immediately after watching the news broadcast. When the comprehension questions were displayed on each student's computer screen, the students responded by writing down their choice on an answer sheet. Like the videos, the comprehension questions were displayed only once. Students could not go back to view the video or read the comprehension questions again. Students were also not permitted to take notes, talk to their peers, or use a dictionary while taking the comprehension tests. The same procedure was repeated for the video segments that followed. Both the experimental and control groups watched the same video clips and took the same tests. The data were collected from the experimental and control groups in separate class periods. After each experiment, all of the answer sheets were collected.

At the end of the three experiments, the students in the experimental group were administered a questionnaire for the researcher to assess their attitudes toward the news broadcasts, subtitles, and advance organizers. However, the control group was not required to complete the questionnaire. The experimental design is shown in Table 3.

Table 3
Experimental Design

	Experiment 1		Experiment 2		Experiment 3	
Group (N)	EG (36)	CG (35)	EG (36)	CG (33)	EG (36)	CG (33)
Subtitles	Yes	No	No	No	No	No
AO	No	No	Unaided AO	No	Teacher-aided AO	NO
Language proficiency	High =11 Mid =13 Low =12	High =15 Mid =10 Low =10	High = 11 Mid = 13 Low = 12	High = 14 Mid = 10 Low = 9	High = 11 Mid = 13 Low = 12	High = 14 Mid = 10 Low = 9

Note: EG refers to experimental group; CG refers to control group.

Data Collection Instruments

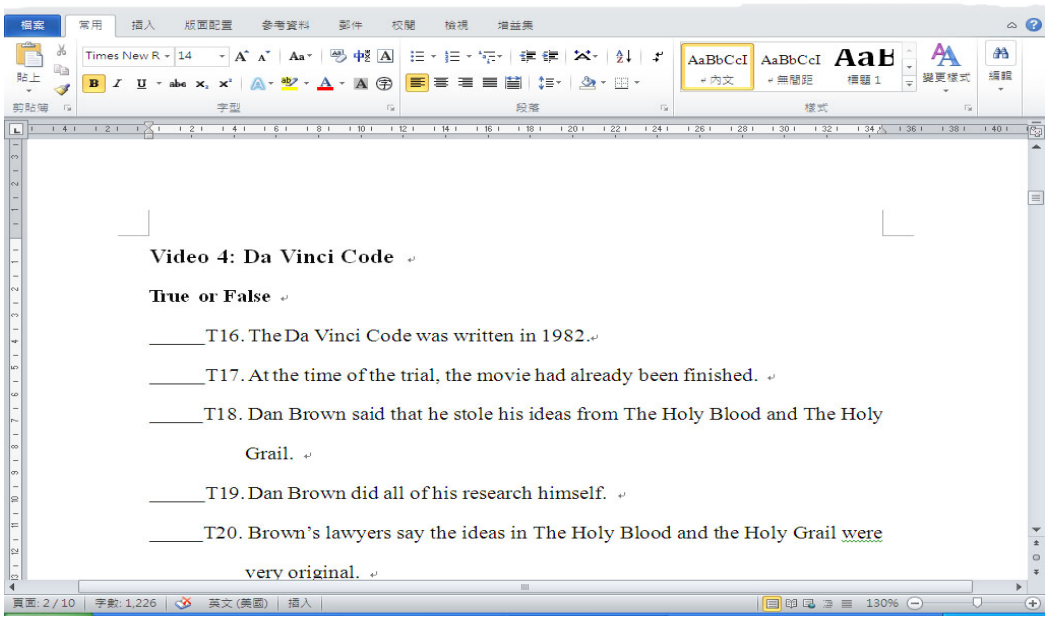
The Comprehension Test

The students' comprehension of the news content was determined by a test containing true/false (Figure 3) and multiple-choice (Figure 4) type questions. The questions were taken directly from the book *Master Listening with CNN News*. The purpose of the comprehension test was to determine how much of the news broadcasts the students comprehended rather than what they learned from the advance organizers (Herron, 1994). In the true/false section, the questions were meant to examine the students' understanding of general information or main idea about the news broadcasts. The questions in the multiple-choice section were aimed at examining the students' understanding of specific information, such as proper nouns, time, place, date, figure, and

key words pertaining to news broadcasts. The students answered the true/false questions before they did the multiple-choice questions. Each correct answer was worth one point.

Figure 3

Screenshot of the True/False Questions



Video 4: Da Vinci Code

True or False

_____T16. The Da Vinci Code was written in 1982.

_____T17. At the time of the trial, the movie had already been finished.

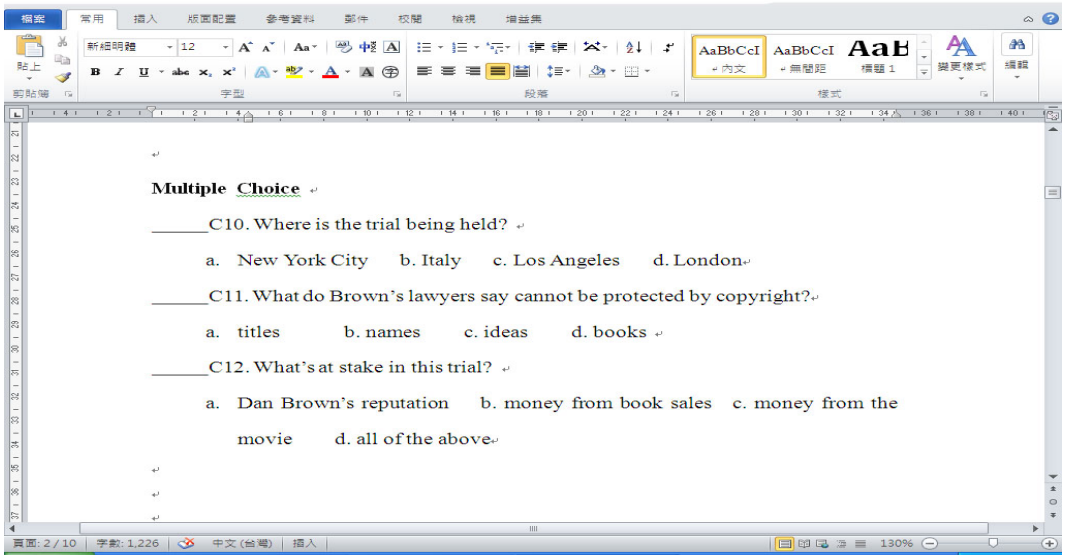
_____T18. Dan Brown said that he stole his ideas from The Holy Blood and The Holy Grail.

_____T19. Dan Brown did all of his research himself.

_____T20. Brown's lawyers say the ideas in The Holy Blood and the Holy Grail were very original.

Figure 4

Screenshot of the Multiple-choice Questions



Multiple Choice

_____C10. Where is the trial being held?

a. New York City b. Italy c. Los Angeles d. London

_____C11. What do Brown's lawyers say cannot be protected by copyright?

a. titles b. names c. ideas d. books

_____C12. What's at stake in this trial?

a. Dan Brown's reputation b. money from book sales c. money from the movie d. all of the above

Attitude Questionnaire

An attitude questionnaire was administered after all three experiments. However, only the students in the experimental group were required to answer the attitude questionnaire which included questions relating to the experimental conditions. The questionnaire modeled similar ones used in previous studies (Ambard & Ambard, 2012; Chung, 2002). It was expected that the students would have generally positive attitudes toward subtitled videos (Winke et al., 2010) and advance organizers as introductory materials (Ambard & Ambard, 2012; Chung, 2002). The questionnaire was comprised of 20 questions in total. Items 1, 2, 3, and 4 dealt with the students' attitudes toward the video clips. Items 5, 6, 7, and 13 were related to their attitudes toward the effectiveness of subtitles. Items 11, 12, 15, and 16 dealt with their attitudes toward the effectiveness of the advance organizers used in the experiments. Items 8, 9, and 10 addressed their attitudes toward the degree of difficulty of the advance organizers. Items 15, 16, 17, 18, 19, and 20 were designed to gain additional information about how to better use advance organizers in assisting the students' listening comprehension. The questionnaire was written in Mandarin Chinese and involved a 5-point Likert scale with the following possible responses: 5=Strongly Agree; 4=Slightly Agree; 3=Neutral; 2=Slightly Disagree; and 1=Strongly Disagree.

Reliability of Data Collection Instruments

GEPT Listening Comprehension Tests (GEPT)

A GEPT listening test was used as a pre-test to assess the learners' general English proficiency level. Internal consistency was determined by using point–biserial correlation to exclude weak test items which did not reach the significance level and failed to discriminate between high and low proficiency learners. Cronbach's alpha was .816 indicating that the measurement was highly reliable (Wu & Tu, 2006).

Point-biserial correlation was conducted to examine the reliability of the comprehension tests. The correlation coefficient showed weak test items that did not reach the significance level were less reliable in discriminating between high and low proficiency learners and were thus eliminated (Wu & Tu, 2006). There were 30 questions in the first experiment, 10 (6 T/F and 4 M/C) x 3 CNN news= 30, but 24 remained in the final version. There were 24 questions in the second experiment two, 8 (5 T/F and 3 M/C) x 3 CNN news= 24, but 21 remained in the final version. There were 24 questions in the third experiment, 8 (5 T/F and 3 M/C) x 3 CNN news= 24, but 22 remained in the final version.

Attitude Questionnaire

The reliability of the attitude questionnaire was examined and its Cronbach's alpha was .847 indicating that the measurement was highly reliable (Wu & Tu, 2006).

Data Analysis Instrument

The collected data were analyzed using Statistical Package for the Social Sciences (SPSS) software for Windows 15.0. The significance level was set at .05. An independent sample t-test was used to analyze differences between the experimental and control groups. A two-way ANOVA was used to analyze the relationship between the students' English proficiency and the study design conditions (subtitles vs. non-subtitles, advance organizers vs. non-advance organizers). A one-way ANOVA was used to analyze differences among the students in the three English proficiency levels that were compared. A one-way repeated ANOVA was used to analyze differences among the students' responses on the attitude questionnaire. A detailed discussion of the statistical methods used is found in the results section.

RESULTS

Research Question 1

In Table 4, the results of independent sample *t*-test indicated that there was no significant difference in the true or false category, $t(69)=1.188$, $p > .05$. There was a significant difference in the multiple-choice, $t(69)=2.176$, $p < .05$, and in the total score, $t(69)=2.307$, $p < .05$.

Table 4
Independent Sample *t*-test of Comprehension Tests in Experiment One

	Subtitle	N	M	SD	*t*	df	p
T/F	Subtitle	36	8.92	2.005			
	Non	35	8.26	2.638	1.188	69	.239
M/C	Subtitle	36	5.36	2.282			
	Non	35	4.34	1.589	2.176	69	.033*
TOTAL	Subtitle	36	14.28	3.067			
	Non	35	12.60	3.060	2.307	69	.024*

*p<.05, **p<.01, ***p<.001

A two-way ANOVA was conducted to examine the interactive effects between subtitles and English proficiency. In Table 6, the ANOVA source of variation results indicated no significant relationship between subtitles and English proficiency, $F(2,65)=.767$, $p=.469$. However, the main effect of English proficiency level was statistically significant, $F(2,65)=5.392$, $p=.007$. The main effect of subtitles was also statistically significant, $F(1,65)=6.796$, $p=.011$. In Table 5, results of Post Hoc test of English proficiency levels using the Bonferroni test indicated that high proficiency learners ($M=13.96$, $SD=2.441$) were significantly better than low proficiency learners ($M=11.86$, $SD=3.694$), $p=.045$. Mid-proficiency learners ($M=14.39$, $SD=2.856$) scored significantly better than low proficiency learners ($M=11.86$, $SD=3.694$), $p=.014$.

Table 5
Results of English Levels and Subtitles Condition

Level	Subtitle	M	SD	N	Post hoc	MD	p
High	Subtitle	14.64	2.873	11	High > Low	2.10	.045*
	Non	13.47	2.031	15	Mid > Low	2.53	.014*
	Total	13.96	2.441	26			
Mid	Subtitle	14.92	3.378	13			
	Non	13.70	1.947	10			
	Total	14.39	2.856	23			
Low	Subtitle	13.25	2.864	12			
	Non	10.20	4.022	10			
	Total	11.86	3.694	22			
Total	AO-Sum	14.28	3.067	36			
	Non	12.60	3.060	35			
	Total	13.45	3.157	71			

Table 6
Two-Way ANOVA of English Levels and Subtitles

Source	Type III SS	df	MS	F	p
Level	90.769	2	45.385	5.392	.007**
Subtitle	57.207	1	57.207	6.796	.011*
Level * Subtitle	12.914	2	6.457	.767	.469
Error		65	8.418		

*p<.05, **p<.01, ***p<.001

Research Question 2

In Table 7, the results of independent sample *t*-test indicated that there was a significant difference in the true or false category, $t(67)=2.332$, $p<.05$. There was no significant difference in the total score, $t(67)=.043$, $p>.05$. The experimental group did not significantly outperform the control group in total score.

Table 7

Independent Sample *t*-test of Comprehension Tests in Experiment Two

	AO	N	M	SD	*t*	df	P
T/F	AO-SumA[1]	36	8.94	1.548			
	Non-AO	33	8.06	1.600	2.332	67	.023*
M/C	AO-SumA	36	4.78	1.333			
	Non-AO	33	5.64	1.388	-2.620	67	.011*
TOTAL	AO-SumA	36	13.72	2.350			
	Non-AO	33	13.70	2.481	.043	67	.965

*p<.05, **p<.01, ***p<.001, [1]unaided-AO

A two-way ANOVA was conducted to examine the effects of advance organizers and English proficiency on the total score. Table 9 indicated a significant relationship between advance organizers and English proficiency, F(2,63)=6.565, p=.003. The main effect of English proficiency levels was also statistically significant, F(2,63)=40.610, p=.000. However, the main effect of advance organizers was not significant at the .05 level, F(1,63)=1.009, p=.319. The one-way ANOVA (Tables 9 and 10) and the follow-up contrasts (Table 11) that compared the six cell means revealed a significant difference, F(5,63)=17.793, p=.000. The mid-proficiency learners located in non-AO were significantly better than peers exposed to unaided-AO, *t*(63)=-2.248, p=.028. The low proficiency learners exposed to unaided-AO were significantly better than the peers located in non-AO, t(63)=2.752, p=.008.

Table 8

Results of English Levels and Unaided-AO Condition

Level	AO	M	SD	N	Post hoc	MD	p
High	AO-SumA	15.82	1.940	11	High > Mid	1.36	.014*
	Non	15.07	1.207	14	High > Low	4.07	.000***
	Total	15.40	1.581	25	Mid > Low	2.71	.000***
Mid	AO-SumA	13.38	1.895	13			
	Non	14.90	1.287	10			
	Total	14.04	1.796	23			
Low	AO-SumA	12.17	1.749	12			
	Non	10.22	1.302	9			
	Total	11.33	1.826	21			
Total	AO-SumA	13.72	2.350	36			
	Non	13.70	2.481	33			
	Total	13.71	2.395	69			

Table 9

Two-way ANOVA of English Levels and Unaided-AO Condition

Source	Type III SS	df	MS	F	p
AO	2.590	1	2.590	1.009	.319
Level	208.548	2	104.274	40.610	.000***
AO * Level	33.711	2	16.856	6.565	.003**
Error		63	2.568		

Table 10

One-Way ANOVA

	SS	df	MS	F	p
Between Groups	228.439	5	45.688	17.793	.000***
Within Groups	161.764	63	2.568		
Total	390.203	68			

Table 11

Contrast Tests of English Levels between the EG and the CG

	Contrast	Value of Contrast	SE	t	df	p
TOTAL	High vs. High	.75	.646	1.157	63	.252
	Mid vs. Mid	- 1.52	.674	-2.248	63	.028*
	Low vs. Low	1.94	.707	2.752	63	.008**

*p<.05, **p<.01, ***p<.001

Research Question 3

In Table 12, the results of independent sample t-test revealed a significant difference in the true or false (teacher-aided AO vs. non-AO), $t(67)=4.445$, $p<.05$, and in the total score, $t(67)=3.200$, $p<.05$. However, there was no significant difference in the multiple-choice, $t(62.926)=-.130$, $p>.05$.

Table 12

Independent Sample *t*-test of Comprehension Test in Experiment Three

	AO	N	M	SD	t	df	p
T/F	AO-SumT[1]	36	9.92	1.888			
	Non-AO	33	8.03	1.610	4.445	67	.000***
M/C	AO-SumT	36	5.47	1.594			
	Non-AO	33	5.52	1.121	-.130	62.926	.897
TOTAL	AO-SumT	36	15.39	2.676			
	Non-AO	33	13.55	2.032	3.200	67	.002**

*p<.05, **p<.01, ***p<.001, [1]teacher-aided

A two-way ANOVA was conducted to examine the relationship between the advance organizers and English proficiency. In Table 14, there was no significant relationship between the advance organizers and English proficiency, F(2,63)=.747, p=.478. The main effect of advance organizers, however, was statistically significant, F (1,63)=9.324, p=.003. Teacher-aided AO (M=15.39, SD=2.676) was significantly better than non-AO (M=13.55, SD=2.032).

Table 13

Results of English Levels and Aided-AO Condition

Level	AO	M	SD	N
High	AO-SumT	15.64	3.557	11
	Non	13.14	2.381	14
	Total	14.24	3.153	25
Mid	AO-SumT	14.92	2.216	13
	Non	14.10	1.792	10
	Total	14.57	2.041	23
Low	AO-SumT	15.67	2.348	12
	Non	13.56	1.740	9
	Total	14.76	2.322	21
Total	AO-SumT	15.39	2.676	36
	Non	13.55	2.032	33
	Total	14.51	2.547	69

Table 14
Two-Way ANOVA of English Levels and Aided-AO Condition

Source	Type III Sum of Squares	df	MS	F	p
AO	55.199	1	55.199	9.324	.003**
Level	.557	2	.278	.047	.954
AO * Level	8.848	2	4.424	.747	.478
Error		63	5.920		

*p<.05, **p<.01, ***p<.001

Research Question 4

Students in the experimental group received one attitude questionnaire with the 5-Point Likert Scale. Table 15 presents the results of attitude questionnaire. Items 5, 15, and 16 inquired into students' attitudes towards the three conditions of the experiments. One-Way repeated ANOVA was conducted to investigate if there was a significant difference in students' preferences among the three conditions (subtitles, teacher-aided advance organizer, and un-aided advance organizer). The tests of within-subjects effects showed that there was a significant difference. Post Hoc tests using the Bonferroni test indicated that exposure to subtitles (M=4.28, SD=.882) was significantly preferred to unaided advance organizer (M=3.75, SD=.874), p=.007, but not to teacher-aided advance organizers (M=4.03, SD=.845), p=.608. Item 3 inquired about barriers (vocabulary, delivery rate, and unfamiliar topics) to understanding CNN news. One-way repeated ANOVA was conducted to investigate if there was a significant difference among students' barriers. The tests of within-subjects effects showed that there was a significant difference. Post Hoc tests using the Bonferroni test indicated that the difficulty of delivery rate (M=.69, SD=.467) was significantly greater than that of unfamiliar topic (M=.25, SD=.439), p=.003, but not greater than that of difficult vocabulary (M=.50, SD=.507), p=.385. The main barrier was delivery rate. Item 6 inquired about student preferences among three sets of subtitles, whether they hoped subtitles would be turned on while watching CNN news. Students had to choose from three alternatives: bilingual subtitles, Chinese subtitles, and English subtitles. One-way repeated ANOVA was conducted to investigate if there was a significant difference. The tests of within-subjects effects showed that there was a significant difference. Post Hoc tests using the Bonferroni test indicated that students significantly preferred bilingual subtitles (M=.61, SD=.494) to Chinese subtitles (M=.11, SD=.319), p=.000, but not to English subtitles alone (M=.31, SD=.467), p=.163. To be clear, students preferred bilingual subtitles to Chinese subtitles while watching CNN news. English subtitles were their second choice. Items 15, 16, 17, 18, 19, and 20 were conditional questions to inquire into students' preferences among different types of advance organizers while watching CNN news. The tests of within-subjects effects showed no significant difference among the six conditions of exposure to advance organizers. Either type of advance organizer was acceptable with no particular preference.

Table 15

Attitude Questionnaire (N=36)

Item	Description	M	SD			
1	Understanding CNN news is very difficult.	4.11	.667			
2	The delivery rate of CNN was too rapid.	4.22	.722			
3	What are the barriers to understanding CNN?	4.08	.692	Voc[1]	SP[2]	Top[3]
4	CNN is beneficial for language learning.	4.00	.828			
5	Subtitles are important when watching CNN. (Experiment 1)	4.28	.882			
6	If you need subtitles, what would be your choice?	4.53	.654	CH[4]	EN[5]	BI[6]
7	Subtitles should be included when watching CNN.	4.11	.667			
8	The advance organizer is relevant to CNN.	4.03	.774			
9	The advance organizer is insufficient in information.	3.78	.760			
10	The advance organizer is too difficult.	3.50	.737			
11	The AO is beneficial to understanding CNN.	3.89	.854			
12	Exposure to AO before watching CNN is beneficial to learning.	3.81	.822			
13	Subtitles should be included even if after exposure to AO.	4.08	.967			
14	AO can help me recall a lot about CNN.	3.56	.969			
15	Teacher's aid with AO is helpful in understanding CNN. (Experiment 3)	4.03	.845			
16	Exposure to AO is beneficial to understanding CNN. (Experiment 2)	3.75	.874			
17	Peer discussion of AO is helpful to understanding CNN.	3.89	.854			
18	Exposure to the full text as a preview is good for understanding CNN.	3.94	.860			
19	Longer exposure to AO is beneficial for understanding CNN.	3.72	.974			
20	Watching videos repeatedly is good for understanding CNN.	4.03	.878			

Note: [1]vocabulary, [2]speed, [3]topic, [4]Chinese,[5]English, [6]bilingual

DISCUSSION

Relationship between English Proficiency and Subtitles

The results of the first experiment are consistent with the findings of Garza (1991), Huang & Eskey (1999-2000), Markhan (1999), Markham et al., (2001), and Markham & Peter (2002-2003). The addition of subtitles did not increase students' cognitive load (Vanderplank, 1988) but rather facilitated comprehension (Garza, 1991). The subtitles acted as a scaffold to help students better comprehend the news broadcasts. However, the results regarding the relationship analysis were inconsistent with the findings of Borrás & Lafayette (1994), Michel & Roebers (2008), Markham (1993), Neuman & Koskinen (1992), Taylor (2005), Townsend & Clarihew (1989), and Vanderplank (1988). The analysis of the relationship revealed that all of the students benefited from subtitles regardless of their English proficiency level (Winke et al., 2010). Probably the difficulty level of the CNN news broadcasts presented an equal challenge to all students. The high proficiency learners' need for subtitles was no less than that of the low proficiency learners. Furthermore, the experimental group outperformed their counterparts on both the true/false and multiple-choice sections of the test. The true/false sections were employed to inquire general information, while the multiple-choice sections inquired specific details relevant to the news broadcasts. The students who saw videos with subtitles did better at answering questions related to general information and those dealing with specific details of the content. Subtitles not only helped students achieve better comprehension (Garza, 1991) but also helped more incidental vocabulary learning to occur (Borrás & Lafayette, 1994; Garza, 1991; Stewart & Pertusa, 2004).

Relationship between English Proficiency and Advance Organizers

The results of the second experiment showed that the students in the experimental group did not significantly outperform their counterparts in the control group. These results were inconsistent with the findings of Chung & Huang (1998), Herron (1994), Herron, Hanley, & Cole (1995), Herron, York, Cole, & Linden (1998), and Teichert (1996). However, they somewhat echoed the findings of Chung (1999, 2002) which revealed that the effects of a single advance organizer (e.g. vocabulary, question previewing, etc.) was not as effective as multiple advance organizers (e.g. vocabulary plus question previewing, etc.). This was probably due to the fact that the L2 learners in previous studies received repetitive visual or verbal reinforcement, such as by watching the videos more than once (Teichert, 1996), from the teacher reading aloud (Herron, 1994), or from the teacher's oral explanations along with advance organizers plus subtitles (Chung & Huang, 1998). Repeated visual or verbal reinforcement assisted L2 learners in obtaining and retaining more meaningful units from the instructional material.

Advance organizers seem to be most effective when the information is organized successfully, but least effective when the reorganization of information proves to be unnecessary. For example, Alvermann (1981) found that the information in advance organizers was too insufficient to activate learners' schemata and to retain information in their long-term memory. In the present study, the rapid delivery rate of the news

broadcasts posed a high cognitive load on the learners. When they received both visual and auditory input, the information processed in their working memory failed to integrate with the knowledge stored in their long-term memory, consequently resulting in limited learning. The unaided advance organizers used in the second experiment neither reduced the learners' intrinsic load, nor facilitated their appropriate load, resulting in a negative impact on their comprehension. Advance organizers may not always be effective in facilitating learning (Herron et al., 1998; Lin et al., 2006; Lin et al., 2005;). When advance organizers are deemed ineffective, it is probably due to the fact that they insufficiently reduce the learner's cognitive load (Lin et al., 2006; Lin et al., 2005) and also because of the learners' problems (Kloster & Winne, 1989).

In addition, the results from the relationship analysis between English levels and advance organizers condition revealed that the low proficiency learners in the experimental group significantly outperformed their peers in the control group. The unaided advance organizers played a limited role in enhancing the high proficiency learners' listening comprehension. The high proficiency learners were able to utilize their English ability or background knowledge to better comprehend the news broadcasts without the assistance of advance organizers.

The results of the third experiment showed that the experimental group significantly outperformed the control group in terms of their overall score. These results were consistent with the studies of Ambard & Ambard (2012), Herron (1994), Herron, Hanley, & Cole (1995), Herron, York, Cole, & Linden (1998), and Teichert (1996). The advance organizers in the third experiment provided relevant information that the learners used to activate their prior knowledge, helped them integrate the audiovisual information with their knowledge in long-term memory, and consequently better comprehended the news broadcasts. The teacher's oral explanation, along with the advance organizers, reduced the learners' cognitive load and facilitated their appropriate load. However, there was no relationship between English proficiency levels and the advance organizers. The news broadcasts were likely challenging for all students. All levels of students benefited from exposure to teacher-aided advance organizers regardless of English proficiency level.

On the other hand, it was found that the low proficiency learners (M=15.67, SD=2.348) in the experimental group had a better overall score than the mid- (M=14.92, SD=2.216) and high- (M=15.64, SD=3.557) proficiency learners. The teacher's oral explanation of the advance organizers likely helped low proficiency learners more and shortened the gap between the low and high proficiency learners. The low proficiency learners benefited from the teacher's oral explanations after being exposed to advance organizers and were thus prompted to reach the same level as the high proficiency learners.

Finally, the results in both the second and third experiments showed that the experimental group outperformed the control group on the true/false questions but not on the multiple-choice questions, implying that the advance organizers were advantageous in assisting learners answer general information questions but not helpful in answering questions regarding specific details (Mayer, 1980).

Subtitles vs. Advance Organizers

To conclude on the effects of the three types of scaffolding (i.e. subtitles, unaided advance organizers, and teacher-aided advance organizers), the unaided advance organizers were the least effective in reducing learners' cognitive load due to the insufficient amount of information provided to the students.

EFL Learners' Attitudes towards the Scaffolds

Students' responses to the attitude questionnaire could be summarized as follows. First, they generally expressed positive attitudes regarding subtitled videos (Borrás & Lafayette, 1994; Huang & Eskey, 1999-2000; Taylor, 2005). Even when students were given advance organizers, they still felt a need for subtitles. These results were in contrast to what Guillory (1998) found (i.e. that full captions distracted students' attention from key elements within the content). However, the addition of subtitles in the present study did not distract students' attention, but rather helped them better comprehend the speakers (Grgurovic & Hegelheimer, 2007). In addition, the students chose bilingual subtitles as their preferred L2 learning tool. They thought Chinese subtitles were better for comprehending plots, while English subtitles were better for L2 learning. Even so, the addition of subtitles could be used to draw learners' attention to key points (Winke et al., 2010). The students in the present study generally felt that the main barrier to their understanding of the content in the news broadcasts was the rapid delivery rate. Thus, the students stated that the English/ Chinese subtitles helped them match the written input with the auditory input they received while the visual images also enhanced their comprehension. Thus, the subtitles, rather than being distractingly redundant, acted as facilitators in helping students overcome the comprehension barrier. Students' reliance on subtitles was due primarily to their habitual use (Grgurovic & Hegelheimer, 2007), especially among students with lower English proficiency levels.

Second, students generally expressed positive attitudes toward advance organizers (Ambard & Ambard, 2012; Chung, 2002), especially the teacher-aided ones in the third experiment. Some of the students, however, had negative attitudes toward the unaided advance organizers employed in the second experiment. The limited information provided in the unaided advance organizers was insufficient in resolving the problems students encountered while watching the news broadcasts. Thus, in general, the students preferred subtitles or aided advance organizers over unaided advance organizers. The unaided advance organizers used in the second experiment were least preferred. Students felt either subtitles (experiment one) or a teacher's verbal explanation plus advance organizers (experiment three) were more helpful than unaided advance organizers (experiment two) in helping them comprehend the content of the news videos.

Finally, the students largely agreed that the news broadcasts placed a high cognitive load on them. They had to expend a large amount of cognitive effort to simultaneously process the visual and auditory information in their working memory. Before being exposed to an unfamiliar learning environment, advance organizers could help reduce a learner's cognitive load. It cannot be denied that the assistance provided in the present study helped reduce the learners' cognitive load. Such assistance could take

numerous forms—subtitles, repeated video viewing, detailed information (full text), longer exposure to advance organizers, or advance organizers plus subtitles—and was considered by students to be viable ways of reducing their cognitive load and further facilitate their listening comprehension.

CONCLUSION

To conclude, the results of this study have shown that all levels of students benefited from scaffolding. The learners generally felt a need for subtitles, especially bilingual subtitles, even after being exposed to advance organizers, suggesting that subtitles are very important to Taiwanese lower-intermediate EFL learners when they are engaged in watching authentic videos.

The L2 learners in the present study were asked to rate the effectiveness of three types of scaffolding and preferred subtitles or aided advance organizers to unaided advance organizers. Furthermore, they did not like unaided advance organizers as much as subtitles because they considered the unaided advance organizers to be too abstract or lacking in detail. Since the learners in the present study were of lower-intermediate level, they were significantly frustrated by the quick delivery rate of the speakers on the news broadcast videos, especially since they could only hear them once. This at least partially explains their strong preference for subtitles or detailed preview activities as a means of helping them overcome their barriers to comprehending the input.

Suggestions for Future Research

The present study did not assess the students' learning styles by trying to identify them as "visualizers" or "verbalizers." It is assumed that different learning styles influence how students learn language in a multimedia learning environment. Future studies could adopt a reliable form of measurement to classify and assess students' learning styles by dividing students into visualizer or verbalizer groups and investigating whether the use of multimedia in language learning contexts is more advantageous to visualizers (Chen, Hsieh, & Kinshuk, 2008).

NOTES

[1] The GEPT (General English Proficiency Test) is developed by Taiwan's LTTC (Language Training and Testing Center). GEPT tests are comprised of four levels—elementary, intermediate, high-intermediate and advanced— to suit EFL learners of different English proficiency. Each level of the GEPT test includes listening, speaking, reading and writing components. The intermediate listening test includes three sections: picture recognition, short conversations, and longer dialogues. Each of these three sections contains 15 multiple-choice questions for a total of 45 questions. The highest possible score for the overall test is 120 with 80 as passing. The GEPT is similar to other international standardized tests, such as TOEFL and TOEIC.

[2] In Taiwan, students who graduate from a vocational high school take an examination to enter a four-year junior college. Those who graduate from a five-year junior college take an examination to enter a two-year senior college. Students in four-year junior colleges and two-year senior colleges have similar education backgrounds. They take courses and receive training that is career-oriented and that equips them with practical skills in order to successfully apply what they have learned in their future careers.

REFERENCES

Alvermann, D. E. (1981). The compensatory effect of graphic organizers on descriptive text. *Journal of Educational Research, 75*(1), 44-48.

Ambard, P. D., & Ambard, L. K. (2012). Effects of narrative script advance organizer strategies used to introduce video in the foreign language classroom. *Foreign Language Annals, 45*(2), 203-228. doi: 10.1111/j.1944-9720.2012.01189.x

Ausubel, D. P. (1968). *Educational psychology: A cognitive view*. New York: Holt, Rinehart and Winston.

Ausubel, D. P. (2000). *The acquisition and retention of knowledge: A cognitive view*. Boston: Kluwer Academic Publishers.

Baddeley, A. (2007). *Working memory, thought and action*. Oxford: Oxford University Press.

Borrás, I., & Lafayette, R. (1994). Effects of multimedia courseware subtitling on the speaking performance of college students of French. *The Modern Language Journal, 78*(1), 61-75. doi: 10.2307/329253

Buck, G. (2001). *Assessing listening*. New York: Cambridge University Press.

Chang, C. C., Tseng, K. H., & Tseng, J. S. (2011). Is single or dual channel with different English proficiencies better for English listening comprehension, cognitive load and attitude in ubiquitous learning environment? *Computers and Education, 57*(4), 2313-2321. doi: 10.1016/j.compedu.2011.06.006

Chen, N. S., Hsieh, S. W., & Kinshuk (2008). Effects of short term memory and content representation type on mobile language learning. *Language Learning and Technology, 12*(3), 93-113.

Chung, J. M., & Huang, S. C. (1998). The effects of three aural advance organizers for video viewing in a foreign language classroom. *System, 26*(4), 553-565. doi: 10.1016/S0346-251X(98)00037-2

Chung, J. M. (2002). The effects of using two advance organizers with video texts for the teaching of listening in English. *Foreign Language Annals, 35*(2), 231-241. doi: 10.1111/j.1944-9720.2002.tb03157.x

Clark, J. M., & Paivio, A. (1991). Dual coding theory and education. *Educational Psychology Review, 3*(3), 149-210. doi: 10.1007/BF01320076

Elkhafaifi, H. (2005). The effect of prelistening activities on listening comprehension in Arabic learners. *Foreign Language Annals, 38*(4), 505-513. doi: 10.1111/j.1944-9720.2005.tb02517.x

Garza, T. J. (1991). Evaluating the use of captioned video materials in advanced foreign language learning. *Foreign Language Annals*, *24*(3), 239-258. doi: 10.1111/j.1944-9720.1991.tb00469.x

Grgurovic, M., & Hegelheimer, V. (2007). Help options and multimedia listening: Students' use of subtitles and the transcript. *Language Learning and Technology, 11*(1), 45-66.

Guichon, N., & McLornan, S. (2008). The effects of multimodality on L2 learners: Implications for CALL resource design. *System, 36*(1), 85-93. doi: 10.1016/j.system.2007.11.005

Guillory, H. G. (1998). The effects of key word captions to authentic French video in foreign language instruction. *CALICO Journal, 15*(1-3), 89-108.

Hanley, J. E., Herron, C. A., & Cole, S. P. (1995). Using video as an advance organizer to a written passage in the FLES classroom. *The Modern Language Journal, 79*(1), 57-66. doi: 10.1111/j.1540-4781.1995.tb05416.x

Herron, C. A. (1994). An investigation of the effectiveness of using an advance organizer to introduce video in the foreign language classroom. *The Modern Language Journal, 78*(2), 190-198. doi: 10.1111/j.1540-4781.1994.tb02032.x

Herron, C. A., Hanley, J. E. B., & Cole, S. P. (1995). A comparison study of two advance organizers for introducing beginning foreign language students to video. *The Modern Language Journal, 79*(3), 387-395. doi: 10.1111/j.1540-4781.1995.tb01116.x

Herron, C. A., York, H., Cole, S. P., & Linden, P. (1998). A comparison study of student retention of foreign language video: Declarative versus interrogative advance organizer. *Modern Language Journal*, *82*(2), 237-247. doi: 10.1111/j.1540-4781.1998.tb01197.x

Horz, H., & Schnotz, W. (2010). Cognitive load in learning with multiple representations. In J. L. Plass, R. Moreno & R. Brunken (Eds.), *Cognitive load theory* (pp. 229-252). New York: Cambridge University Press.

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. doi: 10.2190/RG06-LYWB-216Y-R27G

Jones, L. C. (2009). Supporting student difference in listening comprehension and vocabulary learning with multimedia annotation. *CALICO Journal*, *26*(2), 267-289.

Kloster, A. M., & Winne, P. H. (1989). Effects of different types of organizers on students' learning from text. *Journal of Educational Psychology, 81*(1), 9-15. doi: 10.1037/0022-0663.81.1.9

Lin, H., & Chen, T. (2006). Decreasing cognitive load for novice EFL learners: effects of question and descriptive advance organizers in facilitating EFL learners' comprehension of an animation-based content lesson. *System, 34*(3), 416-431. doi: 10.1016/j.system.2006.04.008

Lin, H., & Chen, T. (2007). Reading authentic EFL text using visualization and advance organizers in a multimedia learning environment. *Language Learning and Technology, 11*(3), 83-106.

Lin, H., Ching, Y. H., Hsu, Y. C., & Dwyer, F. (2010). Learning from animation: The effect of prior knowledge and navigation mode. *International Journal of Instructional Media, 37*(2), 201-212.

Lin, H., Dwyer, F., & Swain, J. (2006). The effect of varied cognitive strategies used to complement animated instruction in facilitating achievement of higher order learning objectives. *International Journal of Teaching and Learning in Higher Education, 18*(3), 155-167.

Lin, H., Kidwai, K., Munyofu, M., Swain, J., Ausman, B., & Dwyer, F. (2005). The effect of verbal advance organizers in complementing animated instruction. *Journal of Visual Literacy, 25*(2), 237-248.

Markham, P. L. (1993). Captioned television videotapes: Effects of visual support on second language comprehension. *Journal of Educational Technology Systems, 21*(3), 183-191. doi: 10.2190/59JJ-0RBN-KKVL-C2YG

Markham, P. (1999). Captioned videotapes and second-language listening word recognition. *Foreign Language Annals, 32*(3). 321-328. doi: 10.1111/j.1944-9720.1999.tb01344.x

Markham, P., & Peter, L. (2002-2003). The influence of English language and Spanish language captions on foreign language listening/reading comprehension. *Journal of Educational Technology Systems, 31*(3), 331-341. doi: 10.2190/BHUH-420B-FE23-ALA0

Markham, P. L., Peter, L. A., & McCarthy, T. J. (2001). The effects of native language vs. target language subtitles on foreign language students' DVD video comprehension. *Foreign Language Annals, 34*(5), 439-445. doi: 10.1111/j.1944-9720.2001.tb02083.x

Mayer, R. E. (1980). Elaboration techniques that increase the meaningfulness of technical text: An experimental test of the learning strategy hypothesis. *Journal of Educational Psychology*, *72*(6), 770-784. doi: 10.1037/0022-0663.72.6.770

Mayer, R. E. (2005). Principles for managing essential processing in multimedia learning: segmenting, pretraining, and modality principles. In R. E. Mayer (Ed.), *The Cambridge handbook of multimedia learning* (pp. 169-182). New York: Cambridge University Press.

Mayer, R. E. (2009). *Multimedia learning* (2nd ed.). Cambridge: Cambridge University Press.

Mayer, R. E., & Moreno, R. (2010). Techniques that reduce extraneous cognitive load and manage intrinsic cognitive load during multimedia learning. In J. L. Plass, R. Moreno & R. Brunken (Eds.), *Cognitive load theory* (pp. 131-152). New York: Cambridge University Press.

Merkt, M., Weigand, S., Heier, A., & Schwan, S. (2011). Learning with videos vs. learning with print: The role of interactive features. *Learning and Instruction, 21*(6), 687-704.

Michel, E., & Roebers, C. M. (2008). Children's knowledge acquisition through film: influence of programme characteristics. *Applied Cognitive Psychology*, *22(9)*, 1228-1244. doi: 10.1002/acp.1431

Moreno, R., & Mayer, R. E. (2010). Techniques that increase generative processing in multimedia learning: open questions for cognitive load research. In J. L. Plass, R. Moreno & R. Brunken (Eds.), *Cognitive load theory* (pp. 153-177). New York: Cambridge University Press.

Moreno, R., & Park, B. (2010). Cognitive load theory: Historical development and relation to other theories. In J. L. Plass, R. Moreno & R. Brunken (Eds.), *Cognitive load theory* (pp. 9-28). New York: Cambridge University Press.

Neuman, S., & Koskinen, P. (1992). Captioned television as comprehensible unit: Effects of incidental word learning from context for language minority students. *Reading Research Quarterly*, *27*(1), 94-106. doi: 10.2307/747835

Plass, J. L. (1998). Design and evaluation of the user interface of foreign language multimedia software: a cognitive approach. *Language Learning and Technology, 2*(1), 40-53.

Richards, J. C., & Rodgers, T. S. (2001). *Approaches and methods in language teaching*. New York: Cambridge University Press.

Rost, M. (1990). *Listening in language learning*. New York: Longman.

Simmons, D. C., Griffin, C. C., & Kameenui, E. J. (1988). Effects of teacher-constructed pre-and post-graphic organizer instruction on sixth-grade science students' comprehension and recall. *Journal of Educational Research, 82*(1), 15-21.

Stewart, M. A., & Pertusa, I. (2004). Gains to foreign language while viewing target language closed caption films. *Foreign Language Annals*, *37*(3), 438-443. doi: 10.1111/j.1944-9720.2004.tb02701.x

Sweller, J. (2005). Implications of cognitive load theory for multimedia learning. In R. E. Mayer (Ed.), *The Cambridge handbook of multimedia learning* (pp. 19-30). New York: Cambridge University Press.

Sydorenko, T. (2010). Modality of input and vocabulary acquisition. *Language Learning and Technology, 14*(2), 50-73.

Taylor, G. (2005). Perceived processing strategies of students watching captioned video. *Foreign Language Annals, 38*(3), 422-427. doi: 10.1111/j.1944-9720.2005.tb02228.x

Teichert, H. U. (1996). A comparative study using illustrations, brainstorming, and questions as advance organizers in intermediate college German conversation classes. *The Modern Language Journal, 80*(4), 509-517. doi: 10.1111/j.1540-4781.1996.tb05473.x

Townsend, M. A. R., & Clarihew, A. (1989). Facilitating children's comprehension through the use of advance organizers. *Journal of Reading Behavior, 21*(1), 15-35.

Vanderplank, R. (1988). The value of teletext subtitles in language learning. *ELT Journal, 42(4)*, 272-281. doi: 10.1093/elt/42.4.272

Wilberschied, L., & Berman, P. M. (2004). Effects of using photos from authentic video as advance organizers on listening comprehension in an FLES Chinese class. *Foreign Language Annals, 37*(4), 534-540. doi: 10.1111/j.1944-9720.2004.tb02420.x

Winke, P., Gass, S., & Sydorenko, T. (2010). The effect of captioning videos used for foreign language listening activities. *Language Learning and Technology, 14*(1), 65-86.

Wu, M. L., & Tu, J. T. (2006). *SPSS and statistical application analysis*. Taipei: Wu Nan.

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