

Effects of Reading-While-Listening & Viewing-With-Subtitles on Incidental Vocabulary Learning

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Abstract

This study explored the effects of Reading-While-Listening and Viewing-With-Subtitles conditions on incidental vocabulary learning. Ten Japanese university students participated and were divided into two groups: the RWL group and the VWS group. Three vocabulary tests, pre, immediate, and delayed tests were conducted to measure the effects of vocabulary learning in both conditions, and learners' perceptions were investigated via a questionnaire. The results revealed that there was a statistically significant difference among the three tests in effects of incidental vocabulary learning. On the other hand, there were no significant differences between the RWL and VWS conditions.

Key words: Incidental vocabulary learning, use of multimedia, captions

1. Introduction

Language learners have many ways to learn second languages (L2) or foreign languages at present. One of the most popular ways is to learn L2 through watching video clips. There are many kinds of programs available for viewing news video clips, such as CNN and Voice of America (VOA). Second language acquisition (SLA) researchers have examined the effects of L2 learning using video clips.

This study used a viewing system which included captions and long or short clips—also familiar to L2 vocabulary acquisition. Researchers have shown that viewing materials could encourage learners in incidental vocabulary learning (IVL) studies. One of the most notable learning vocabulary studies is incidental vocabulary learning and using such viewing conditions has been applied in this study. Previous SLA researchers have debated about definitions of IVL. For instance, Sok (2014) defined incidental learning in vocabulary research, generally speaking, as referring to the learning of words that occurs seemingly naturally in the context of everyday life.

Peters & Webb (2018) reported the effects of viewing conditions. In their research, participants watched one-hour documentary clips and these contributed to learners' vocabulary gains in meaning recall and meaning recognition. In summary, dealing with viewing conditions on IVL can be a great opportunity for learners to expand their vocabulary knowledge.

The present study examines how the viewing condition affects IVL, compared to Reading-While-Listening (RWL).

2. Literature review

2.1. Incidental vocabulary learning through the Reading-While-Listening condition

Many researchers have reported positive effects of incidental vocabulary studies through reading. Vidal (2011) argued that reading is an efficient source of acquisition on retention. Webb et al. (2013) reported that frequency was an important method for studying learners' L2 collocations on IVL through reading.

Their study showed that collocations need to appear 15 times for learners to learn them. Moreover, studies of extensive reading have also been developed by many researchers in IVL (e.g., Chang & Hu, 2018; Pigada & N. Schmitt, 2006; Webb & C.-S. Chang, 2015). Pigada and N. Schmitt (2006), for example, found that effective vocabulary acquisition is possible via extensive reading.

Likewise, researchers have focused on the Reading-While-Listening (RWL) condition in IVL to promote learners to acquire their L2 vocabulary (e.g., Brown et al., 2008;; Chang, 2009; Chang, 2011; Chen, 2020; Hossain & Hasan, 2022; Teng, 2016; Vu & Peters, 2021). Hossain & Hasan (2022) studied effects of RWL in terms of form recognition, grammar recognition, and meaning recall, and argued that RWL could be an important condition to acquire L2 vocabulary. Brown et al (2008) explored the effects of audio enhancement during extensive reading on IVL. In their study, three conditions: Reading only (RO), Listening only (LO), and RWL conditions, were examined and resulting RWL and RO conditions could meet more target items than the LO condition, in terms of meaning recall. Chang (2011) found that RWL outperformed RO in vocabulary gain when extensive reading was performed at the same time. Chang reported RWL increased students' speed in the listening process. Chang (2009) found that RWL could be used to develop learners' listening proficiency. Chen (2020) studied the effects of RWL with timed PowerPoint slides on form meaning and form recognition, and argued that RWL outperformed RO in form meaning and learners' proficiency. Altogether, RWL conditions can be helpful for learners to study their L2 vocabulary.

2.2. IVL through the Viewing-With-Subtitles Condition

Audio-visual support is a valuable element to promote learners' L2 vocabulary acquisition and the study using captioned clips on IVL; this has been applied by many researchers (e.g., Baranowska, 2020; Yuksel & Tanriverdi, 2009; Peters & Perez, 2014; Peters, Heynen, & Puimege, 2016;; Teng, 2022). Yuksel & Tanriverdi (2009) found that movie clips with captions demonstrated more gains than non-captioned conditions. Peters & Perez (2014) examined the types of captions: no caption, keyword caption which was captioned only for target words, and fully keyword-highlighted captions consisting of highlighted target words in full captions. Baranowska (2020) compared L2 subtitles with L1 subtitles and

showed L2 subtitles outperformed L1 subtitles in terms of vocabulary gain.

There are some papers which compare different types of input on IVL. Feng & Webb (2019) studied the effects of three types of input modes: reading, listening, and viewing, for vocabulary learning. In their research, there were no significant differences among those three modes of input conditions; however, all of them contributed to vocabulary learning in terms of retention.

2.3. Effects of visual enhancement: Comparison between RWL and VWS

Researchers have also compared captioned video clips and RWL texts to find the utility of visual enhancement (e.g., Cekic & Demirezen, 2021; Feng, 2017; Neuman & Koskinen, 1992; Yeh & Wang, 2003). Neuman & Koskinen (1992) reported captioned video provides learners with a rich language environment. In their research, participants were divided into four groups: Captioned TV, Non-captioned TV, RWL, and Reading textbook only groups and found captioning condition could be helpful for L2 vocabulary learning. Yeh & Wang (2003) examined effects of visual enhancement on IVL with use of pictures and concluded that 'text plus picture' was the most effective type of vocabulary annotation. Feng (2017) investigated five types of input modes: RO, LO, and Viewing-With-Subtitles (VWS), Non-subtitled viewing, Silent-Viewing-With-Subtitles and showed no significant differences between them. Cekic & Demirezen (2021), on the other hand, reported RWL could be a more conducive multimodal presentation for IVL than VWS. However, the comparison between RWL and VWS did not show a significant difference between them. The current study aims to examine whether or not visual enhancement can be efficient for learning L2 vocabulary incidentally.

3. The Purpose of this Study and Research Questions

As mentioned in earlier sections, learners have gained their L2 vocabulary incidentally through the RWL condition, as shown in the research literature. At the same time, researchers have argued that learners have also acquired their L2 vocabulary through the VWS condition. Nonetheless, few studies have shown significant differences, concerning whether or not visual enhancement is

effective for IVL. Therefore, the aim of this present study is to compare incidental vocabulary learning (IVL) while Reading-While-Listening (RWL) and Viewing-With-Subtitles (VWS). There are three main research questions, as shown below:

RQ 1. Are there any positive effects of Incidental vocabulary learning while Reading-While-Listening and Viewing-With-Subtitles?

RQ 2. Which type of input can contribute more effectively while Incidental vocabulary learning? 1) Reading-While-Listening or 2) Viewing-With-Subtitles?

RQ 3. What are learners' perceptions concerning different types of input activity?

4. Method

4.1. Participants

Ten EFL participants ranging from 19 to 22 years old joined this experiment. They were English-major students in a Japanese college and university, and have EIKEN Grade 2 to pre-1 levels.

The participants were divided into those two groups: the Reading-While-Listening group called Group RWL and the Viewing-With-Subtitles group called Group VWS.. They were randomly assigned to each group. Five students were in Group RWL and another five students were in Group VWS.

4.2. Materials

Three different kinds of video clips from EnglishCentral were used in this research. Each clip lasted from 2:42 to 2:46 minutes/seconds. The Text 1 title was "The Volcano and Volcanologist" (2 min and 42 sec), the Text 2 title was "Blended learning" (2 min and 43 sec), and the Text 3 title was "The Reduction of the educational budget" in the United States (2 min and 46 sec).

The students in Group VWS watched original movies of EnglishCentral. On the other hand, those in Group RWL used edited versions of the clips. The edited versions had both sound and text but no video. To make texts without pictures, PowerPoint was mainly used for the study. First of all, sounds were extracted from each text by using the QuickTime Player in a MacBook Air and were replaced with mp3 files. Secondly, the researcher inserted the mp3 files and the captions

into PowerPoint so that the participants could both listen to the sounds and see the captions simultaneously.

4.3. Target words

Fifteen words, five from each text, were selected as target items. The frequency of the target items ranged from one to five occurrences. All of them were 1,000- and 2,000-word levels in Cobb's VocabProfilers.

Table 1: A list of target words and their frequency of occurrences

	Target word (word family)	Frequency of occurrences
Text 1 (Volcano and volcanologist)	Responsibility	1
	Extremely	1
	Interaction	1
	Volcanic	2
	Eruption	2
Text 2 (Blended learning)	Orientate	1
	Diverse	1
	Indicator	1
	Astonish	1
	Skeptical	1
Text 3 (Reduction of educational budget in USA)	Frustrate	1
	Superintendent	2
	Recession	3
	Funding	5
	Fluctuation	1

4.4. Instruments

4.4.1. Vocabulary test

The vocabulary tests were conducted using Google Forms. The participants were required to answer three questions on each word. The first question was about whether they knew the word or not; the second question was about whether they knew the meaning of the word, and on the third question, they needed to write a Japanese translation of the word. The pretest consisted of 30 items: the 15 target words and 15 dummy words which were set up to prevent learners from presuming

IVL during the treatment. The immediate post-test and the delayed post-test excluded the distractors and students needed to answer only the target words; the method of testing is explained just below.

4.4.2. Comprehension test

The participants believed that this experiment aimed to investigate the effects of comprehension through different types of reading input, so a multiple-choice comprehension test was conducted in each text. The questions provided in English Central were implemented using Google Forms.

4.4.3. The questionnaire for effects of RWL and VWS conditions on incidental vocabulary learning from learners' perceptions

To investigate participants' data individually, a questionnaire on the effects of incidental vocabulary learning through Reading-While-Listening and Viewing-With-Subtitles was given. In addition, a questionnaire for comprehension was also given to attract the students' interest to the effects of comprehension. Both of them were also created from Google Forms.

5. Procedure

All the participants were told that the purpose of this study was to investigate comprehension through different types of reading input. This study investigated whether the participants could learn vocabulary incidentally; therefore, the vocabulary test was not announced beforehand.

The experiment was carried out for three days. On the first day, all the participants completed the vocabulary pretest. Secondly, they signed the informed consent after the researcher explained the basic information about this experiment. On the second day, the participants experienced the main research treatment, in two groups: 1) The participants in the Reading-While-Listening group watched three texts with PowerPoint slides; the participants in 2) the Viewing-With-Subtitles group watched three texts from the English Central site. All participants watched their texts twice and answered the comprehension test in each text. Afterwards, they completed an immediate vocabulary test and a questionnaire

about comprehension. Two weeks later, the participants were told the authentic purpose of this study, after taking the delayed vocabulary test and answering the questionnaire on incidental vocabulary learning.

6. Analysis

To investigate the data of this study, two-way ANOVA was conducted as the method to analyze the data. First, participant scores of three tests: pre, immediate, and delayed tests, were analyzed to examine whether or not incidental vocabulary learning did occur. Second, concerning the correlation between the two groups, the RWL and VWS group, were both analyzed to find the effects of visual enhancement.

7. Results

RQ 1: Are there any effects of Incidental vocabulary learning through Reading-While-Listening and Viewing-With-Subtitles?

Descriptive statistics were instituted in order to investigate whether or not there was a significant difference among the three tests (pre-, immediate-, and delayed-tests). As shown in Table 2, the results reveal that there is a significant difference among the three tests with two-way ANOVA [$F(2, 16) = 17.16, p < .001, r^2 = .68$]. To investigate the post-hoc analysis, The Bonferroni procedure also showed a meaningful effect. In this analysis, the scores on the immediate- and delayed-tests outperformed the pre-test. On the other hand, the results between immediate- and post-tests did not show any difference.

To examine the effects of learner vocabulary acquisition in more detail, differences among the target words were also analyzed. As described earlier, 15 words had been chosen as the target items in the study. The results have shown that there were statistically significant differences among the words [$F(2, 44) = 12.75, p < .001, r = .48$]. In the post-hoc analysis, the Bonferroni Procedure revealed that the results of immediate- and delayed-tests outperformed the pre-test in terms of word correlations. On the other hand, there were no differences between the immediate- and delayed-test.

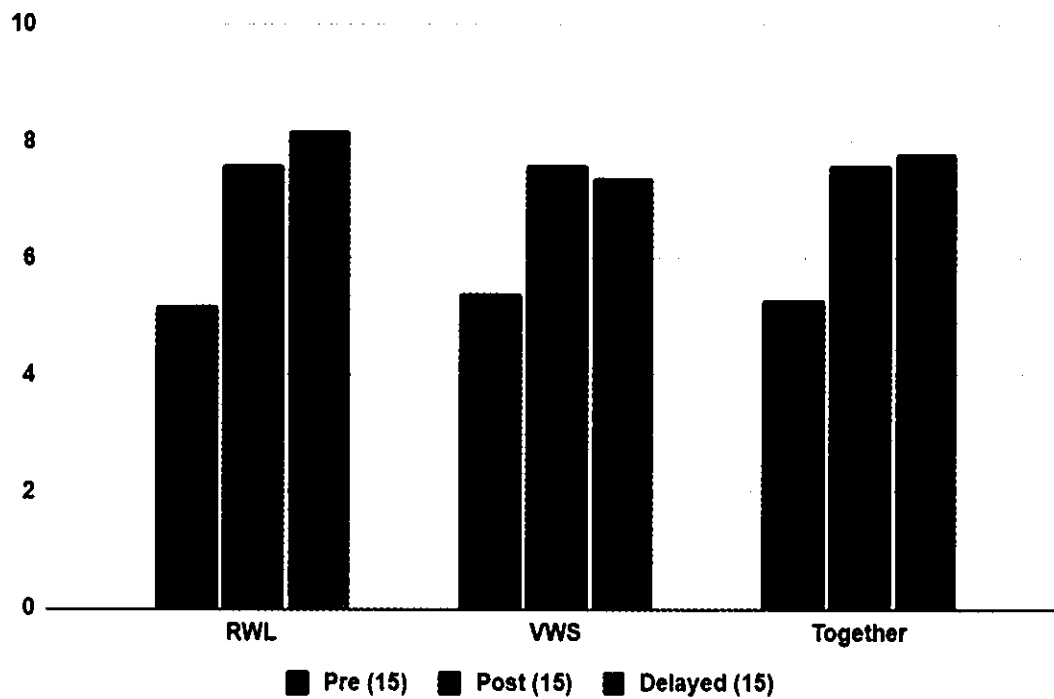


Figure 1: Results of three tests

Table 2: Descriptive statistics for results among the groups

	Reading-While- Listening (RWL; n = 5)	Viewing-With- Subtitles (VWS; n = 5)	All together (n = 10)
	Mean (S.D)	Mean (S.D)	Mean (S.D)
Pre-test	5.2 (2.2)	5.4 (3.6)	5.3 (2.8)
Immediate- test	7.6 (3.0)	7.6 (4.8)	7.6 (3.8)
Delayed- test	8.2 (4.3)	7.4 (3.8)	7.8 (3.9)

Table 3: ANOVA results among the three tests

Source	Sum of squares	df	Mean square	F	Sig.	Partial r
A	0.30	1	0.30	0.0076	0.9327 ns	0.0009
s/A	316.40	8	39.55			
B	38.60	2	19.30	0.6222	0.0001***	0.6820
A/B	1.40	2	0.70		0.5492 ns	0.0722
s/A/B	18.00	16	1.12			

Total 374.7000 29 12.9207 +p < .10, *p < .05, **p < .01, ***p < .001

Main effects of groups (RWL & VWS): F (1, 16) = .01, p = .93, Not significant

Main effects of tests (pre/immediate/delayed): F (2, 16) = 17.16, p < .001, r² = .68

Significant

Table 4: Descriptive statistics for results among the words

	n	Means	S.D.
Pre-test	15	3.5	3.1
Immediate-test	15	5.1	2.7
Delayed-test	15	5.2	2.8

Table 5: ANOVA results for the words

Source	Sum of squares	df	Mean square	F	Sig.	Partial r
s	312.80	14	22.34			
A	25.73	2	12.86	12.75	0.0001***	0.48
s/A	28.27	28	1.01			

Total 366.8000 44 8.3364 +p < .10, * < .05, **p < .01, ***p < .001

Main effects of tests by words: F (2, 44) = 12.75, p < .001, r² = .48 Significant

RQ 2: Which type of input can contribute more effectively, regarding Incidental vocabulary learning between Reading-While-Listening and Viewing-With-Subtitles?

The second research question was to compare the effects of two conditions; RWL and VWS, on IV L and aimed to discover the effectiveness of visual enhancement. The results showed that there was no significant difference in the two conditions among the three tests with two-way ANOVA [$F(1, 16) = .01, p = .93$].

RQ 3: What are learners' perceptions regarding different types of input activity?

To investigate the third research question, participants completed the questionnaire which asked whether or not each type of input was efficient for participants to learn L2 vocabulary on IVL. The results found that all participants in the VWS group answered affirmatively that the VWS condition could contribute to their vocabulary acquisition, while answers in the RWL group were separated: two of them answered that RWL can be helpful to learn L2 vocabulary, but three of them found that RWL was unhelpful. As shown in Table 6, moreover, visual enhancement can be a more effective and supportive method for learners' vocabulary learning than the condition which contains only text with audio enhancement.

Table 6: Feedback from learners

	RWL	VWS
Yes	<ul style="list-style-type: none"> ● Able to distinct known or unknown vocabulary from audio enhancement ● Easy to focus on vocabulary learning 	<ul style="list-style-type: none"> ● Effective input from visual information ● Able to imagine vocabulary with viewing information ● Easy to understand the scene and useful for vocabulary learning ● Useful to catch the information ● Helpful to guess for comprehension and vocabulary learning
No	<ul style="list-style-type: none"> ● Difficult to guess the first encountered vocabulary ● Hard to imagine the story only with sentences and audio enhancement 	<ul style="list-style-type: none"> ● Hard to pay attention for vocabulary

8. Discussion

8.1. Overall incidental vocabulary learning

This study explored learners' incidental vocabulary gains with three research questions: effects of incidental vocabulary learning through RWL and VWS, comparison of two types of conditions, and learners' perceptions. The analysis for the first research question showed that the significant vocabulary gain could occur through both RWL and VWS conditions among the three tests. As shown in Table 2, learners could retain L2 vocabulary they learned during the experiment even if two weeks have passed. In addition, the results also revealed that there are positive effects of vocabulary learning among the 15 target words. Many researchers pointed out effects of RWL which means audio enhancement (e.g., Brown et al., 2008; van Zeeland & Schmitt, 2013; Vu & Peters, 2021). Moreover,

the importance of visual input and captions have also been argued at the same time; this condition has also played an important role in learner's L2 learning on IVL (e.g., Peters & Webb, 2018; Feng & Webb, 2019; Teng, 2022). Current study could contribute those studies to become reliable ways for vocabulary learning with positive results and proved the importance of incidental vocabulary learning through RWL and VWS conditions.

8.2. Comparison of input modes between RWL and VWS

The second research question of this study was to compare whether visual enhancement is helpful for learners to gain L2 vocabulary or not in between RWL and VWS conditions. In answer to the second research questions, the results revealed that there were statistically no significant differences between two conditions among the both three tests and word correlations. As described in the former section, Previous researchers have conducted comparison studies between these conditions for many years (e.g., Cekic & Demirezen, 2021; Feng, 2017; Neuman & Koskinen, 1992; Yeh & Wang, 2003). Although Cekic & Demirezen (2021) reported RWL condition could be more effective than VWS condition, few studies have shown reliable findings of both conditions for vocabulary learning. This study aimed to report the importance of visual enhancement with comparisons between the RWL and the VWS conditions, however, could not find a significant difference between the both conditions.

8.3. Learners' perception

Current study could not find statistically effectiveness of visual enhancement on IVL. On the other hand, visual enhancement can be considered to assist learners' vocabulary learning on their mental aspect. The third research question was to explore participants' perception with the questionnaire, whether visual enhancement was attributed to their learning. As shown in Table 6, results showed that the questionnaire could pick up several positive opinions for visual enhancement by participants. For instance, visual enhancement could be helpful for them to be able to image and guess word meanings easily. Interestingly, participants in the RWL group also seem to feel visual enhancement can be effective for vocabulary learning rather than only the condition only with audio

enhancement. Altogether, visual enhancement can become an effective way to learn L2 vocabulary and should be promoted for learners' motivation to study.

9. Conclusion

Overall, this study showed the effects of two types of input modes: Reading-While-Listening condition and Viewing-With-Subtitles condition on incidental vocabulary learning. Through the treatment and analysis, the results revealed that incidental vocabulary learning could be helpful for learners to acquire their L2 vocabulary. RQ 1 dealt with incidental vocabulary learning through two types of input activities. The result showed that learners could incidentally gain L2 vocabulary effectively in both RWL and VWS conditions. The scores of the immediate posttest were much higher than those of the pre-test while the scores of the delayed-test did not change from the immediate test, which means learners could retain their acquired vocabulary. To answer RQ 2, this study compared the RWL condition with the VWS to investigate effects of visual enhancement. The result revealed that there was no significant difference between the two conditions. Several research (e.g., Neuman & Koskinen, 1992; Yeh & Wang, 2003) have explored benefits of visual enhancement, however, the results of this study could not contribute to help previous research. RQ 3 dealt with learners' perception of ways for vocabulary learning from their questionnaire. Despite both RWL and VWS conditions could contribute to learners' learning, most of learners tend to prefer learning their vocabulary with visual enhancement.

This study pedagogically suggests that both RWL and VWS conditions can be helpful for learners' incidental vocabulary learning. Through the treatment of this study, learners can acquire and retain their learned L2 vocabulary if they receive their appropriate level (i+1) input. These learning methods can be used not only for learners' own learning but also for students in classroom. Current study also showed that much more input promoted learners' vocabulary gain. In the treatment, the target items which had higher frequent appearances in the texts tended to be higher in vocabulary gain. Learners can improve their receptive words effectively if they continue audio input activity and be exposed to words frequently. Effectiveness of visual enhancement was explored with RQ 2 during

the study. The results showed no significant difference between the two conditions. This result implies that whether or not texts have visual enhancement is not related to improvement of vocabulary gain. On the other hand, learners tend to prefer learning vocabulary with visual support which can be available them to guess and imagine unknown words.

There are several limitations in this study. First, this study investigated only ten university students. The increase of participants may give different results and lead to better understanding of incidental vocabulary learning. Secondly, the participants experienced only one condition due to time constraints in this study. To produce more reliable results, participants could experience both conditions. Thirdly, this study was conducted with only three texts with 2 min 45 seconds length for each to reduce learners' physical loads. Therefore, they might not have taken enough input to learn vocabulary during the experiment. Lastly, participants were divided into the groups with their English skills to be able to survey more reliable experiment. However, dividing groups should have carried out with learners' accurate prior vocabulary knowledge. Therefore, Vocabulary Scale Test should be used to solve this limitation as the need for further study.

This study explored the effects of visual enhancement on IVL by comparing with two types of input mode. Both conditions could be helpful for learners to study their L2 vocabulary, however, importance of visual enhancement could not be found. For the future study, these conditions should be compared with more enforced conditions.

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