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Incidental Vocabulary Learning through Listening to Songs

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Abstract

Use of songs as the vehicle for language teaching/learning has become common practice (Medina, 1993). Nevertheless, there are no experimental studies examining the potential learning gains from songs. The present study investigates incidental learning of three vocabulary knowledge dimensions (spoken-form recognition, form-meaning connection, and collocation recognition) through listening to two songs. The effects of repeated listening to a single song (1,3, or 5 times) and the relationship between frequency of exposure to the targeted vocabulary items and learning gains were also explored. Two multiple choice tests (one for each song) that each measured the different dimensions of vocabulary knowledge were used to evaluate learning. The results indicated that (a) listening to songs contribute to vocabulary learning (b) repeated listening had a positive effect on vocabulary gains and (c) frequency of exposure positively affected learning gains. The pedagogical implications are discussed in detail.

Keywords

Incidental learning, songs, vocabulary, frequency of exposure, repeated listening, and depth of vocabulary knowledge

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Chapter 1: Introduction

1.0 Introduction

Humans have a natural tendency for communicating and interacting with one another. Language having a fundamentally social function allows for meaningful human interactions (Dorney, 2009), thus for decades' language acquisition and its use, have interested researchers and scholars across scientific fields. With daily innovations in science and technology, allowing people from all around the world to communicate with one another, the use of language has become more complex while the need to go beyond one's first language (L1) and acquiring a second (L2) or multiple languages for effective communication with people of other languages is increasing. This change in the modern world has led to the development of a new strand of research in applied linguistics related to second or additional language acquisition (SLA), which attempts to answer questions including: How do individuals acquire an additional language? What can be done from the educational standpoint to enhance student's learning process? (Loewen, 2014)

This study will focus on how individuals acquire an additional language by focusing on vocabulary acquisition through a source of language input that is popular among learners: listening to songs (Lindgren & Munoz, 2013).

Research has indicated that vocabulary learning is an essential part of acquiring a second or additional language and learners need a large vocabulary size to become efficient users of the target language (Schmitt, 2008). Researchers have identified two methods for acquiring vocabulary. These methods include (a) deliberate or intentional vocabulary learning, and (b) incidental vocabulary acquisition (Loewen, 2014). Intentional or deliberate vocabulary learning

involves explicit attention to learning vocabulary items that can be accompanied by explicit instructions from the language teacher. In contrast, incidental learning takes place while individuals learn new vocabulary as a byproduct of a different activity such as reading, watching television, teacher talk, and listening to music in the target language (Loewen, 2014). Considering the vast number of vocabulary items in languages, deliberate teaching and learning of all the words is an unrealistic goal, thus a large portion of vocabulary learning needs to be accomplished through incidental learning (Nation, 2011).

In light of the important role incidental learning plays in L2 vocabulary acquisition, this method has received considerable attention from researchers in the past few decades, especially incidental vocabulary acquisition through reading (e.g. Horst, 2005; Webb, 2007), and listening (e.g. Van Zeeland and Schmitt, 2013; Vidal, 2011). More recently, in search of alternative sources of language input that would be available to learners all around the world, researchers have investigated incidental vocabulary learning through watching television programs and movies (e.g. Rogers, 2013). Nevertheless, very little research has been done with regards to using music or more specifically L2 songs as a source of input for vocabulary acquisition.

Considering the availability and motivating nature of songs as the means of teaching and learning a new language (Murphey, 1992a), this study used two English songs as the source of language input to investigate the extent to which students can incidentally learn new vocabulary items or deepen their knowledge of partially known words through listening to songs.

Nation's (2001, 2011) vocabulary knowledge framework was used for evaluation of vocabulary knowledge gains in this study. This framework classified word knowledge into three main components: form, meaning, and use. Each component was then broken down into smaller components, which are: spoken form, written form, different parts of the word that have

meaning, form and meaning connection, associations with the word, grammatical function, collocations, concepts and referents of each word, and the constraints on use of the words which refers to when and where the word can be used appropriately. Thus, to master a word, Nation (2001) suggested that learners need to learn all components of word knowledge. Other researchers investigating vocabulary learning have also found that some aspects of vocabulary knowledge develop prior to others (Webb, 2007; Van Zeeland & Schmitt, 2013). Thus, for an accurate evaluation of vocabulary knowledge it is important to measure each aspect of word knowledge separately.

In the present study spoken form recognition, form meaning connection, and collocation recognition aspects of word knowledge were used to measure learning gains. Knowledge of spoken form recognition refers to whether participants can recognise the spoken forms of the target words. Knowledge of form meaning connection refers to whether students can make the connection between the meaning of the word and the spoken form of the word. Lastly, knowledge of collocation recognition, refers to whether participants could recognize the words that occur together with other words.

The present study also explored two factors potentially influencing learning gains: frequency of exposure to target vocabulary items and the number of times the same song was heard. Previous studies, examining frequency of exposure to target vocabulary items while reading (Webb, 2007) and listening to short passages (Van Zeeland & Schmitt, 2013) found a positive relationship between learning gains and frequency of exposure. Research involving incidental learning from repeated exposures to the same text, through reading (Horst & Meara, 1999) or repeated exposures to the same story book through listening (Penno, Wilkinson, & Moore, 2002) also found that as the number of times participants read or heard the same text

increased, their vocabulary gains increased as well. Thus, in this study the effects of frequency of exposure to the target vocabulary items which varied from 1 to 30 encounters, and the number of times participants listened to the same song (1, 3, and 5 times) were examined.

Chapter 2: Ethics

Due to the educational nature of this research project, human participants were used to collect data. To ensure the physical and mental wellbeing of the participants throughout this study, in accordance with the human ethics requirements, permission and consent was collected from all who were involved directly and indirectly with the study.

Western University's Ethics Board approval was obtained prior to launching the study (see Appendix B). This study took place in the country of Thailand. Therefore, prior to entering the country for research purposes, a research proposal was submitted to the *National Research Council of Thailand* (NRCT) and their permission to carry out the study was obtained.

Upon arrival in Thailand and at the target school, a bilingual information sheet, including all the necessary information about the study was presented to the school director/ principal, the teachers, the parents of the students, and the students participating themselves. A bilingual written consent from the guardians of the participants and verbal consent from the participants, stating that the student's participation was voluntary and that they may withdraw from the experiment at any time, was obtained prior to starting the study.

The consent forms and any other information collected from the participants throughout the study was kept with the researcher performing the study, while no personal information that could threaten the confidentiality of the participants was released in any reports from this study.

Chapter 3: Article

3.01 Abstract

Previous studies investigating incidental vocabulary learning through listening to songs have primarily relied on participant's self-report surveys indicating the amount of hours learners listen to songs and its relationship with their vocabulary knowledge (Kuppens, 2010; Lindgren & Munoz, 2013). Only one experimental study has investigated vocabulary learning gains from listening to songs. From the results of the study the researcher concluded that learning does occur from listening to songs. However, the amount of learning gains was unclear and the study was limited to meaning based vocabulary tests, thus the learning of other dimensions of vocabulary knowledge was not accounted for. The present study investigated incidental acquisition of three vocabulary knowledge dimensions (spoken-form recognition, form-meaning connection, and collocation recognition) through listening to two songs. The effects of repeated listening to a single song (1,3, or 5 times) and the relationship between frequency of exposure to the targeted vocabulary items and learning gains was also explored. Two multiple choice tests (one for each song) that each measured the different dimensions of vocabulary knowledge were used to evaluate learning gains. The results indicated that (a) listening to songs contributed to vocabulary learning, (b) repeated listening had a positive effect on vocabulary gains, and (c) frequency of exposure positively affected learning gains. The pedagogical implications are discussed in detail.

3.02 Introduction

Songs can provide large quantities of language input. Research suggests that young adults in North America listen to approximately 18.4 hours of music every week (Levey, Levey, & Fligar, 2011). In a survey of media use in Europe, 61.3% of citizens of the European Union reported that they listened to music every day, while 40% of the correspondents claimed not to

read any books (European Commission, 2002). Although there is a wealth of research investigating vocabulary learning through reading (e.g., Horst, 2005; Webb, 2007; Webb & Chang, 2015a), there is little research investigating vocabulary learning through listening to songs.

Studies focused on student self-reports and teacher experiences revealed several benefits of using songs as a source of second language (L2) input (Kerekes, 2015; Lems, 2001; Richards, 1969). For example, songs can provide large quantities of language input and are highly motivating (Murphey, 1992a). Use of songs for language learning has also proven to reduce foreign/second language classroom anxiety and assist learner's memory (Abbott, 2002; Dolean, 2016). Medina (1993) is the only study to empirically investigate L2 incidental vocabulary learning from listening to songs. This study provided evidence that songs may potentially contribute to L2 vocabulary growth. However, the amount of vocabulary learning that occurred from listening to the song was not made clear and a children's song rather than a popular song was used as the listening material.

The current study explores incidental vocabulary acquisition through listening to two pop songs and seeks to determine whether lexical knowledge is retained two weeks after exposure. Three aspects of vocabulary knowledge (spoken-form recognition, form-meaning connection, and collocation recognition) were measured to provide a rigorous assessment of the potential learning that may occur through listening to songs. In addition, because people tend to listen to the same song multiple times (Abbott, 2002; Kerekes, 2015; Lems, 2001), the effects of repeated listening to a single song on learning gains was also examined. Earlier research exploring repeated reading and repeated reading while listening (Horst & Meara, 1999; Webb & Chang, 2012) found that repeated exposures to the same source of input can increase vocabulary

learning. Finally, the relationship between the frequency of occurrence of the target items in the songs and vocabulary gains was examined. Earlier studies of incidental vocabulary learning have indicated that frequency of occurrence contributes to incidental vocabulary learning from other sources of input including reading texts (Webb, 2007) and listening to passages (Van Zeeland & Schmitt, 2013b).

3.03 Background

3.03.01 Incidental vocabulary learning

Incidental vocabulary acquisition involves learning words as the by-product of an activity that is not deliberately designed for that purpose (Gass, 1999; Hulstijn, 2001; Loewen, 2015). Researchers believe that it is responsible for most first language (L1) vocabulary growth (Nation, 2001; Webb & Nation, 2017). However, when learning a second language (L2) in non-English speaking communities where individuals are not naturally exposed to large quantities of L2 input, deliberate teaching and learning of the L2 may be responsible for the majority of L2 vocabulary learning (Laufer, 2003).

Nation (2006) investigated the vocabulary size needed to understand different types of English discourse. He suggested that learners need to know the most frequent 6,000 to 7,000 word families to understand spoken discourse and the most frequent 8,000 to 9,000 word families to understand written discourse. More recently studies have suggested that knowledge of the 3,000 most frequent word families might be sufficient for comprehension of spoken discourse (Van Zeeland & Schmitt, 2013a; Webb & Rodgers, 2009a, 2009b). Nevertheless, research indicates that most learners in the EFL context are unable to learn the most frequent 3,000 words let alone the most frequent 8,000 to 9,000 words (Webb & Chang, 2012b). This

suggests there is value in finding new ways to fuel L2 vocabulary growth. Learning vocabulary incidentally through encountering larger amounts of L2 input in different types of spoken and written discourse may provide the greatest potential to promote L2 vocabulary growth (Webb & Nation, 2017).

3.03.02 Incidental vocabulary learning through listening

Prior to entering formal schooling, vocabulary development in children is dependent on listening (Vidal, 2011). L1 learners have the advantage of rich input environments with plenty of opportunities to learn incidentally through listening. L2 learners in foreign language (EFL) contexts do not have the advantage of rich input environments. This has led researchers in recent years to investigate the amount of incidental vocabulary learning that can occur through listening to sources of input that are available to learners in poor input environments. For example, Van Zeeland and Schmitt (2013b) investigated L2 incidental vocabulary learning through listening to several different sources of spoken input including listening passages from television talk shows, television interviews, and informal lectures. Their results indicated an overall vocabulary learning gain of 29.2% immediately after listening and 19% two weeks after listening.

English language as a source of spoken academic discourse is used internationally in symposiums, academic conferences, and lectures which has led researchers to further examine incidental vocabulary learning from this source of listening input (Long & Richards, 1994). Vidal (2003) examined incidental vocabulary learning through academic listening. The results indicated large learning gains of 16.07% after listening and that 8.2% of the gains were still retained after four weeks. In a follow-up study, Vidal (2011) compared incidental vocabulary learning through reading academic texts and listening to academic lectures. She found significant gains in both learning methods. Large learning gains of 15.5% were found through listening on

the immediate post-test and learning gains of 7.8% were still retained four weeks later. Taken together, Van Zeeland and Schmitt (2013) and Vidal's (2003, 2011) studies reveal the potential for listening to contribute to L2 vocabulary growth.

Another source of language input is L2 songs. Songs have the potential to be a valuable resource for vocabulary learning for six reasons. First, they can provide large quantities of language input. A sub study of the project *Early Language Learning in Europe* (ELLiE) looked at different sources of out of school exposure to the foreign language (FL) (Lindgren & Munoz, 2013). Internet use, watching films with/without subtitles, playing video games, reading and speaking in FL, and listening to music in FL were among the sources of FL input. The target FL was English for most of the participants in this study and the participants reported that listening to music was the most common type of exposure outside the classroom. In another study, a survey taken from 374 Flemish Dutch-speaking students from 12 different primary schools, reported that listening to music in English was by far the most common source of exposure to the English language, and more than 90% of the participants listened to music more than three times per week (Kuppens, 2010).

Second, corpus driven studies analyzing pop songs suggest that these songs are repetitive, conversation-like, and that the mean speed of speech of 75.49 words per minutes was half the speed of spoken discourse (Murphey, 1992b). These characteristics along with the "song-stuck-in-my-head phenomenon" or the "Din in the head" which is uncontrollably rehearsing the song in one's head (Murphey, 1990) gives songs the potential to be an effective source of input for vocabulary learning.

Third, individuals tend to listen to the same song multiple times (Kerekes, 2015;

Richards, 1969). In a study investigating repeated listening to a story, researchers found that after a single exposure learners began to show some knowledge of the target vocabulary items. However, as the number of exposures to the story increased their depth of knowledge of the target vocabulary items increased as well, and they were able to use the target items more accurately in retelling the story (Penno, Wilkinson, & Moore, 2002). Other research investigating repeated reading and repeated reading while listening to a single text also indicated that as the number of exposures increased so did knowledge of vocabulary items (Horst & Meara, 1999; Webb & Chang, 2012a). Thus, repeated listening to songs may potentially increase vocabulary learning.

Fourth, a lot of the same words are encountered in different songs. A corpus analysis of 50 pop songs indicated that 25% of the corpus was composed of just 10 different words (Murphey, 1992b). Studies have demonstrated that repeated encounters with the targeted vocabulary items can foster vocabulary acquisition (Horst, Cobb, & Meara, 1998; Peters, Heynen, & Puièmge, 2016; Webb & Chang, 2015b). Furthermore, as the number of encounters with the target vocabulary items increase, learners develop knowledge of different dimensions of the vocabulary items. For example, in the study by Van Zeeland and Schmitt (2013b), they found that knowledge of spoken form recognition needed fewer exposures to the target vocabulary items and was developed prior to grammar and form-meaning connection. From this study, they also concluded that 15 or more exposures to the target words were needed for adequate learning to take place from listening sources of language input. Taken together, the large amount of time spent listening to songs (Kuppens, 2013; Levey, Levey, & Fligar, 2011) and the frequent encounters with words within/between songs suggest that songs have the potential to provide the repeated encounters that are needed for vocabulary learning to take place.

Fifth, songs can also assist memory in language acquisition. Brain imaging studies have suggested that music and melodic patterns are processed in the same area of the brain as language. Thus, the rhythmical arrangement of language in songs can lead to deeper processing and better retention of words (Abbott, 2002; Kerekes, 2015; Lems, 2001; Maess et al., 2001).

Sixth, it has been demonstrated that the use of songs in foreign language classrooms tends to decrease anxiety levels in high anxiety classrooms (Doleon, 2016). Foreign language classroom anxiety (FLCA), can cause frustration, skipping, and acting out, which can hinder the language learning process (Horwitz, Horwitz, & Cope, 1986). Thus, if songs are found to be a valuable source of language input, they might also be considered an effective teaching tool that provides a tranquil learning environment fostering second/foreign language learning.

Although there's a wealth of information suggesting the potential advantages of songs as a vehicle for incidental vocabulary learning, there is only one experimental study that has been conducted in this area. Medina (1993), investigated learning gains from listening to a song and compared it to a spoken version of the story. The results indicated that learners could acquire a similar amount of vocabulary knowledge through listening to the song and the spoken rendition of the story. This study provided evidence that songs may potentially contribute to L2 vocabulary learning. However, the study was limited to listening to a children's story book song that was chosen due to its simplicity and comprehensibility for young learners. Thus, it is unclear whether songs that are typically found on the radio, and are perhaps the most likely type of songs listened to by L2 learners, can contribute to incidental vocabulary learning. Furthermore, Medina's (1993) study investigated the extent to which the form-meaning connection of target words was learned. However, vocabulary knowledge is multi-dimensional and there are several different types of lexical knowledge that can be gained (Nation, 2011; Richards, 1976; Schmitt,

1994). For example, orthography, syntax, grammatical function, collocations, and form-meaning connection are all different aspects of vocabulary knowledge, and each one can be isolated and measured separately to more accurately evaluate the extent of learning (Webb, 2005, 2007). Consequently, it would be useful to examine which other aspects of lexical knowledge may be learned through listening to songs. For example, knowledge of the spoken forms of individual words and sequences are also likely to be learned through listening to songs.

3.04 Research Questions

1. Does listening to songs contribute to L2 incidental vocabulary learning?
2. To what extent does listening to songs increase knowledge of spoken-form recognition, form-meaning connection, and collocation recognition?
3. To what extent does the number of times participants hear a song affect incidental learning of the three dimensions of vocabulary knowledge?
4. What is the relationship between frequency of occurrence and the three dimensions of vocabulary learning?

3.05 Method

3.05.01 Participants

A total of 300 students in grades five ($N= 151$) and six ($N=149$), from a public school in a city in central Thailand took part in this study. Their ages ranged from 10 to 14 ($M= 11.45$, $SD= 0.72$). All participants had studied English for a minimum of five years and their teachers reported that they were at a similar level of proficiency. Nevertheless, for an accurate indication of their vocabulary knowledge, the participants completed the 1,000 and 2,000 levels of a bilingual (English and Thai) version of the Vocabulary Levels Test (VLT) available on Paul

Nation's Website (<http://www.victoria.ac.nz/lals/about/staff/paul-nation>). The participants achieved an average raw score of 12.9 out of 60 on both levels combined. A correct response on the VLT represents knowledge of 33.3 words (Webb and Chang, 2015a), thus the participants in this study had knowledge of approximately 430 of the most frequent 2,000 words indicating that they were all at a beginner level of English proficiency.

The school had randomly assigned the participants to one of four classes in each grade. The classes in each grade level were randomly assigned to one of four conditions for this study.

3.05.02 Research Instruments

Songs. Two English songs were selected as the learning material for the study. The song “Every breath you take” by The Police (1983) was used for the first part of the study (Song A), lyrics of the songs can be found on

<https://play.google.com/music/preview/Txiiooytyg5e4yntoofe7t7vggu?lyrics=1&u=0> - ”.

“Die a happy man” by Thomas Rhett (2015) was used for the second part of the study (Song B), lyrics of the songs can be found on

https://play.google.com/music/preview/Tpapaymqwyjdpcf7uu4pgz2346u?lyrics=1&utm_source=google&utm_medium=search&utm_campaign=lyrics&pcampaignid=kp-lyrics&u=0” . Several

conditions were considered for selecting the target songs. First, it was important that the participants had not heard the songs prior to the study. This condition ensured that the learning gains found in the study could be attributed to the learning conditions which increased the internal validity of the study (Nation & Webb, 2011). Second, the target songs needed to be age appropriate and interesting to the participants. Nation (2007) suggested that for incidental vocabulary learning to take place, the materials used needed to be interesting to the learners. This condition would motivate learners and foster learning. Based on communications with

participants' teachers prior to starting the study the first two conditions were met by the two songs selected. Third, the target songs needed to have both single word items and collocations that could be used for measuring vocabulary gains in this study. Fourth, for optimum learning, 95% of the vocabulary items need to be within the learner's previous knowledge (Nation, 2007).

The lyrics of each song were analyzed with the computer software program *Range* (Heatley & Nation, 2002) and Nation's (2016) *British National Corpus/ Corpus of Contemporary American English* (BNC/COCA) word family lists. The Range analysis indicates the vocabulary difficulty level of each song based on the lexical frequency of its words (Nation & Webb, 2011).

The analysis (see Tables 1 & 2) indicated that the participants needed to know the most frequent 2000 word families to reach 95% lexical coverage of the songs for optimal unassisted incidental vocabulary learning (van Zeeland & Schmitt, 2013a). In comparison to the results of the VLT, the analysis indicated that many of the words in the songs were likely to be unknown. However, it is likely that many L2 songs heard by beginner EFL learners include a proportion of unknown words that exceeds 5%, and thus although this may make them difficult to understand, the songs likely represent ecologically valid listening material.

Table 1 Lexical frequency profile: Every Breath You Take

LEVEL	TOKEN	TOKEN%	CUMTOKEN%
1	270	91.53	91.53
2	11	3.73	95.26
3	6	2.03	97.29
4	3	1.02	98.31

5	3	1.02	99.33
32	2	0.68	100.01

Table 2 Lexical frequency profile: Die A Happy Man

LEVEL	TOKEN	TOKEN%	CUMTOKEN%
1	286	90.51	90.51
2	11	3.48	93.99
4	1	0.32	94.31
5	2	0.63	94.94
6	1	0.32	95.26
31	6	1.90	97.96
32	6	1.90	99.06
33	1	0.32	99.38
Not in the lists	2	0.63	100.01

Target words. Eight single-word items and eight collocations were selected as the target items for Song A. The target items in Song B were 19 single-word items and seven collocations. All the collocations had mutual information (MI) scores above three. The MI score is a “statistical measure of relatedness: the probability of two events occurring together compared to their occurring independently” (Beran, 2000. P. 274). A MI score above three indicates that the two words that make up the collocation are highly related. The target items for the two songs are shown in Table 3.

Table 3 Target single word items and collocations

Song	Single word items	Frequency of exposure	Collocations	MI Score	Frequency of exposure
Every Breath You Take	Single	3	Breath (you) Take	3.50	3
	Smile	3	Step (you) Take	3.30	6
	Belong	2	Game (you) Play	4.28	3
	Dream	1	Vow (you) Break	3.75	3
	Replace	1	Claim (you) Stake	5.42	3
	Trace	1	Heart Ache	5.25	2
	Bond	3	Smile (you) Fake	4.36	3
	Embrace	1	Without (a) Trace	4.61	1
Die a Happy Man	Die	6	Bottle (of) Wine	7.51	1
	Enough	2	Pouring Rain	7.35	1
	Between	2	Northern Lights	4.73	2
	Build	1	Wildest Dreams	10.56	1
	Last	1	Listen (to the) Radio	3.96	1
	True	1	Sports Car	3.91	1
	Under	1	No Doubt	5.33	1
	Fancy	1			
	Escape	1			
	Coast	1			
	Dark	1			
	Star	1			
	Knee	1			
	Saint	1			
	Fireplace	1			
	Destination	1			
	Mansion	1			
	Vacation	1			
	Masterpiece	1			

3.05.03 Dependent Measures

A multiple-choice vocabulary test was designed using the guidelines outlined by Nation and Webb (2011). This test was used for the pretest, immediate posttest, and delayed posttest to track and compare the progress of the participants throughout the study. The test included three

sections each measuring a different aspect of vocabulary knowledge. Because listening to songs is an aural task, the cues in the test were presented in aural form. The participants were asked to listen for the questions and the options of the multiple-choice tests from a recording and mark their responses on a test sheet. Each question included three options and an “I don’t know” option. Research suggests that in multiple choice tests, three options (the correct answer and two distracters) is sufficient and that the quality of the test is determined by how well the distracters are made as opposed to how many distracters are included (Nation & Webb, 2011).

1. Spoken-form recognition

Section A of the test examined spoken-form recognition of the single word items. This section included eight multiple choice items for Song A and 19 multiple choice items for Song B. The two distracters for the multiple-choice test options in this section were two nonsense words. Using nonsense words ensured that the participants did not recognize the distracters. These words were created by changing the first letter of a low frequency word so that they would look and sound like real words in English. The number of syllables was controlled to match the target words so that the participants would not dismiss the distracters based on word length. The distracters contained the same word parts and belonged to the same part of speech as the target words. Once all distracters were created they were checked by a Thai/English speaker to avoid correspondence with any L1 words.

For this section, participants were instructed in their L1 to select the word they recognized. An example question is shown in (I). All participants listened to the same recording of the test in which there was a two second gap between options and a four second gap between questions. The time frame was based on Van Zeeland and Schmitt’s (2013b) study of incidental vocabulary learning through listening.

(I) Spoken-form recognition test:

The participant sees on paper:

คำถามนี้จะเป็นตัววัดความสามารถในการรับรู้

A. แบบทดสอบการรับรู้: จงเลือกคำตอบที่ถูกต้องจากเสียงที่ได้ฟัง

1. (A) (B) (C) (D) ฉันทำอะไรไม่ได้เลย

At the same time the participant hears on the recording

‘Number one [1sec.] A, Corsal [2 sec.] B, Single [2 sec.] C, Pustic [2 sec]

2. Form-meaning connection

Section B of the test examined form-meaning connection of the single word items. This section included eight multiple-choice items for Song A and 19 multiple-choice items for Song B. In this section, the participants heard the target words and were asked to circle the corresponding Thai translation of the word from three options they were presented with on the test sheet. An example question is provided in (II). The two distracters in this section included a word that was the answer to another question on the test, and a word that was in the same song as the target word but was not used as a target item on the test. The participants were given 10 seconds to respond to each question followed by a four second gap between each question.

(II) Form-meaning connection test:

The participant sees on paper:

B. การแปล: จงเลือกคำที่มีความหมายที่ถูกต้องจากเสียงที่ได้ฟัง

1. (A) ความฝัน (B) ลมหายใจ (C) โอบกอด (D) ไม่ทราบ

At the same time the participant hears on the recording

‘Number one [1sec.] Embrace’

3. Collocation recognition

Section C of the test examined participants' knowledge of collocation recognition. The test included eight multiple-choice items for Song A and seven multiple-choice items for Song B. In each question, participants heard the target collocation and two distracters and were asked to select the sequence that they recognized. Because the concept of collocation is difficult for L2 learners to understand (Webb & Kagimoto, 2011), prior to starting the recording, an example question with an answer that was familiar to the participants was given to the participants. The example and one question from this section is provided in (III).

The distracters in this section included (a) the node word of the target collocation together with a collocate of another node word on the test, and (b) the node word of the target collocate and another word from the song. Each question in this section was repeated twice with four second gaps between each question.

(III) collocation recognition test:

This example was written on the class board and explained prior to starting this section of the test:

- A) Sing a song B) Sing a food C) Sing a ball
D) I don't remember any of these.

The test question:

The participant sees on paper

C. จับคู่: จงจับคู่ของคำที่ถูกต้องจากเสียงที่ได้ฟัง

1. (A) (B) (C) (D) ฉันจำอะไรไม่ได้เลย

At the same time the participant hears on the recording

‘Number one [1sec.] A, Bottle of dress [2 sec.] B, Bottle of wine [2 sec.] C, Bottle of car [2 sec.]

3.05.04 Procedure

The data was collected over five 60-minute sessions and each session was separated by a week. In the first week, all participants completed the VLT, a demographic information form, and the pretest for both songs. In week two, the pre-existing classes were randomly assigned to a control group (C) or one of the three experimental groups (E1, E3, and E5). There were eight groups in total, two control groups (one at grade five level and one at grade six level), and six experimental groups (three at grade five level and three at grade six level).

In week two, the experimental groups completed the posttest immediately after listening to Song A. The experimental groups varied in the number of times they listened to the song. E1 listened to the song once, E3 listened to the song three times, and E5 listened to the song five times. The control group completed the immediate posttest for Song A without listening to the song.

In week three, participants repeated the procedure from week two for Song B. In week four, the participants completed the delayed posttest for Song A, and in week five they completed the delayed posttest for Song B. (See Appendix C for an overview of the procedure)

3.05.05 Scoring

SPSS (Version 24) for MacOs was used to analyse the data. Before running any analysis, the data from the participants who missed any of the testing sessions (pretest, immediate posttest, and delayed posttest) was removed and marked as missing. To answer the first, second and third research questions, all data were scored dichotomously with one for a correct response and zero

for an incorrect response. Since real words were used in this study, correct responses were expected for some of the items on the pretest.

To answer the fourth research question, each item on the test was scored individually as *not learned* (incorrect on the pretest and incorrect on the posttests), *guessed* (correct on the pretest and incorrect on the posttests), *known* (correct on the pretest and the posttests), and *learned* (incorrect on the pretest and correct on the posttests). Next, the data from the *not learned* and *learned* scores were analyzed with Pearson Product-Moment Correlations to assess the relationship between frequency of occurrence and learning gains.

3.06 Results

The descriptive statistics of vocabulary test scores for each song on each section of the test are presented in Tables 4 and 5.

Song A

For the spoken-form recognition section of the pretest, the control, E1, E3, and E5 groups had mean scores of 2.78, 2.15, 2.65, and 2.75 out of eight, respectively. After the intervention session, the control group's score decreased resulting in a mean score of 2.24 on the immediate posttest, while E1, E3, and E5 scores increased resulting in mean scores of 2.87, 2.85, and 3.39, respectively. On the two-week delayed posttest, the mean scores were 2.57, 3.61, 2.89, and 3.34 for the control, E1, E3, and E5 groups, respectively.

For the meaning connection section of the pretest, the control, E1, E3, and E5 groups had mean scores of 2.92, 3.21, 2.75, and 3.39 out of eight, respectively. After the intervention, the mean scores on immediate posttest were 3.13, 3.30, 2.68, and 3.34 for the control group, E1, E3, and E5, respectively. The mean scores for the delayed posttest were 4.16, 4.33, 2.95, and 3.37 for the control, E1, E3, and E5 groups, respectively.

For the collocation recognition section of the pretest, the control, E1, E3, and E5 groups had mean scores of 2.48, 2.61, 2.48, and 2.41 out of eight, respectively. After the intervention, the control, E1, E3, and E5 had mean scores of 2.46, 2.94, 2.73, and 2.66 on the immediate posttest, respectively. On the delayed posttest, the mean scores were 3.16, 2.91, 2.58, and 3.05 for the control, E1, E3, and E5 groups, respectively.

Song B

For the spoken-form recognition section of the pretest, the control, E1, E3, and E5 groups had mean scores of 7.27, 6.53, 6.15, and 6.42 out of 19, respectively. After the intervention, the mean scores on the immediate posttest were 5.85, 6.06, 6.41, and 8.61 for the control group, E1, E3, and E5, respectively. On the two-week delayed posttest, the mean scores were 6.23, 7.60, 6.54, and 7.24 for the control, E1, E3, and E5 groups, respectively.

On the meaning connection section of the pretest, the control, E1, E3, and E5 groups had mean scores of 8.85, 5.60, 7.39, and 9.64 out of 19, respectively. After the treatment, the mean scores were 8.15, 7.46, 7.15, and 10.11 for the control group, E1, E3, and E5, respectively. The mean scores on the delayed posttest were 7.88, 7.33, 7.22, and 9.68 for the control, E1, E3, and E5 groups, respectively.

On the spoken-form collocation recognition section of the pretest, the control, E1, E3, and E5 groups had mean scores of 3.00, 2.00, 1.73, and 2.77 out of seven, respectively. After the intervention, the control group, E1, E3, and E5 had mean scores of 2.19, 2.33, 3.07, and 3.04 on the immediate posttest, respectively. On the delayed posttest, the mean scores were 2.65, 2.67, 2.49, and 2.81 for the control, E1, E3, and E5 groups, respectively.

Table 4 Descriptive statistics of vocabulary test scores for song A

Participant subgroups	Spoken-form recognition			Form-meaning connection			Collocation recognition		
	Pretest	Immediate posttest	Delayed posttest	Pretest	Immediate posttest	Delayed posttest	Pretest	Immediate posttest	Delayed posttest
Control (<i>n</i> = 37)	2.78 (1.06)	2.24 (1.16)	2.57 (1.37)	2.92 (1.38)	3.13 (1.79)	4.16 (1.79)	2.48 (1.39)	2.46 (1.52)	3.16 (1.32)
E1 (<i>n</i> = 33)	2.15 (1.20)	2.87 (1.55)	3.61 (1.58)	3.21 (1.65)	3.30(1.74)	4.33 (1.74)	2.61 (1.34)	2.94 (1.14)	2.91 (1.18)
E3 (<i>n</i> = 48)	2.65 (1.19)	2.85 (1.27)	2.89 (1.18)	2.75 (1.73)	2.68 (1.46)	2.95 (1.65)	2.48 (1.37)	2.73 (1.53)	2.58 (1.23)
E5 (<i>n</i> = 41)	2.75 (1.24)	3.39 (1.39)	3.34 (1.61)	3.39 (1.45)	3.34 (1.37)	3.37 (1.67)	2.41 (1.18)	2.66 (1.54)	3.05 (1.64)
Total (N = 159)	2.60 (1.19)	2.85 (1.39)	3.08 (1.46)	3.05 (1.57)	3.08 (1.59)	3.63 (1.78)	2.49 (1.31)	2.69 (1.45)	2.91 (1.37)

Note. Maximum score on all sections of the test was 8.

Table 5 Descriptive statistics of vocabulary test scores for song B

Participant subgroups	Spoken-form recognition			Form-meaning connection			Collocation recognition		
	Pretest	Immediate posttest	Delayed posttest	Pretest	Immediate posttest	Delayed posttest	Pretest	Immediate posttest	Delayed posttest
Control (<i>n</i> = 26)	7.27 (2.44)	5.85 (2.01)	6.23 (2.25)	8.85 (3.38)	8.15 (2.99)	7.88 (3.56)	3.00 (1.13)	2.19 (1.09)	2.65 (1.41)
E1 (<i>n</i> = 15)	6.53 (3.46)	6.06 (2.02)	7.60 (1.76)	5.60 (2.47)	7.46 (1.81)	7.33 (1.76)	2.00 (1.56)	2.33 (1.34)	2.67 (0.98)
E3 (<i>n</i> = 41)	6.15 (2.13)	6.41 (2.56)	6.54 (2.63)	7.39 (1.96)	7.15 (2.63)	7.22 (3.05)	1.73 (1.30)	3.07 (1.36)	2.49 (1.43)
E5 (<i>n</i> = 62)	6.42 (2.24)	8.61 (2.02)	7.24 (2.83)	9.64 (3.14)	10.11 (3.34)	9.68 (3.06)	2.77 (1.56)	3.40 (1.05)	2.81 (1.38)
Total (N = 144)	6.51 (2.40)	7.22 (2.49)	6.89 (2.60)	8.44 (3.11)	8.64 (3.22)	8.41 (3.03)	2.44 (1.50)	2.98 (1.27)	2.67 (1.36)

Note. Maximum score on spoken-form recognition and form-meaning connection was 19 and the maximum score on collocation recognition was 7.

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To answer the first and second research questions, repeated measures ANOVA were used to compare scores within each group (experimental and control) at different times of testing (pretest, immediate posttest, and delayed posttest).

Song A

On the spoken-form recognition section of the test, for the experimental groups Mauchly's Test of Sphericity indicated that the assumption of sphericity had been met $\chi^2(2) = 1.38, p > 0.05$, and the within-subject main effect (time) was statistically significant, $F(4, 238) = 2.53, p = 0.041$ with partial $\eta^2 = 0.041$ (small effect size). The analysis for the control group indicated that the assumption of sphericity had been violated, $\chi^2(2) = 9.43, p < 0.05$, and therefore, a Greenhouse-Geisser correction was used. The results indicated the within-subject main effect (time) was not statistically significant $F(1.61, 58.24) = 2.33, p = 0.11$.

On the form-meaning connection section of the test, for the experimental groups Mauchly's Test of Sphericity indicated that the assumption of sphericity had been met $\chi^2(2) = 5.81, p > 0.05$, however the within-subject main effect (time) was not statistically significant, $F(4, 238) = 2.09, p = 0.082$. The analysis for the control group indicated that the assumption of sphericity had been met $\chi^2(2) = 0.009, p > 0.05$, and the within-subject main effect (time) was statistically significant, $F(2, 72) = 7.28, p = 0.001$ with partial $\eta^2 = 0.168$ (large effect size).

On the collocation recognition section of the test, for the experimental groups Mauchly's Test of Sphericity indicated that the assumption of sphericity had been met $\chi^2(2) = 0.39, p > 0.05$, however the within-subject main effect (time) was not statistically significant, $F(4, 238) = 0.64, p = 0.63$. The analysis for the control group indicated that the assumption of sphericity had been met $\chi^2(2) = 0.21, p > 0.05$, and the within-subject main effect (time) was statistically significant, $F(2, 72) = 3.19, p = 0.047$ with partial $\eta^2 = 0.081$ (medium effect size).

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The pairwise comparison between pretest and immediate posttest scores indicated that for the spoken-form recognition section of the test, there was a significant increase for experimental groups with medium effect size ($d = 0.373$) and a significant decrease for control groups with medium effect size ($d = 0.485$). In addition, a significant increase was found between pretest and delayed posttest for experimental groups with medium effect size ($d = 0.508$). On the form-meaning connection section, a significant increase was found for the control groups between pretest to delayed posttest with a large effect size ($d = 0.778$). No other significant differences were found in the pairwise comparisons.

Song B

On the spoken-form recognition section of the test, for the experimental groups Mauchly's Test of Sphericity indicated that the assumption of sphericity had been met $\chi^2(2) = 1.38, p > 0.05$, and the within-subject main effect (time) was statistically significant, $F(4, 230) = 4.498, p = 0.002$ with partial $\eta^2 = 0.073$ (medium effect size). The analysis for the control group indicated that the assumption of sphericity had been violated, $\chi^2(2) = 7.67, p < 0.05$, and therefore, a Greenhouse-Geisser correction was used. The results indicated that the within-subject main effect (time) was not statistically significant, $F(1.50, 30.03) = 2.23, p = 0.136$.

On the form-meaning connection section of the test, for the experimental groups Mauchly's Test of Sphericity indicated that the assumption of sphericity had been met $\chi^2(2) = 0.26, p > 0.05$, however the within-subject main effect (time) was not statistically significant, $F(4, 230) = 1.96, p = 0.10$. The analysis for the control group indicated that the assumption of sphericity had been met $\chi^2(2) = 0.63, p > 0.05$, and the within-subject main effect (time) was not statistically significant, $F(2, 40) = 2.79, p = 0.073$.

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For the collocation recognition section of the test, for the experimental groups Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated $\chi^2(2) = 45.57, p < 0.05$, and therefore, a Greenhouse-Geisser correction was used. The results indicated that the within-subject main effect (time) was statistically significant, $F(3.01, 172.99) = 7.26, p = 0.000$. The analysis for the control group indicated that the assumption of sphericity had been violated $\chi^2(2) = 7.3, p < 0.05$, and therefore, a Greenhouse-Geisser correction was used. The results indicated that the within-subject main effect (time) was not significant, $F(1.51, 30.32) = 1.55, p = 0.228$.

The pairwise comparison between pretest and posttest on the spoken-form recognition section of the test indicated that there was a significant decrease with large effect size ($d=0.704$) for the control group. On the collocation recognition section of the test, the results from pretest to immediate posttest indicated a significant increase with large effect size ($d=0.598$) for the experimental groups and a significant decrease with large effect size ($d=0.72$) for the control group. The comparison between pretest and delayed posttest for the collocation recognition section of the test, also showed a significant increase with small effect size ($d=0.251$) for the experimental groups. There were no other significant differences found in the other pairwise comparisons. The pairwise comparisons between pretest and immediate posttest scores and pretest to delayed post test scores are shown in Table 6.

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Table 6 Pairwise comparison for different sections of the tests

Time of testing (<i>i</i>)	Time of testing(<i>j</i>)	Difference between means (<i>j-i</i>)	<i>SD</i> error	<i>p</i>	95% confidence interval for the difference	
					Upper bound	Lower bound
AA Experimental						
1	2	0.523*	0.160	0.004	-0.911	-0.135
	3	0.763*	0.172	0.000	-1.181	-0.346
AA Control						
1	2	-0.541*	0.204	0.035	0.029	1.052
	3	-0.216	0.236	1.000	-0.377	0.809
AB Experimental						
1	2	-0.007	0.176	1.000	-0.420	0.433
	3	0.435	0.192	0.076	-0.902	0.032
AB Control						
1	2	0.216	0.349	1.000	-1.093	0.660
	3	1.243*	0.345	0.003	-2.110	-0.376
AC Experimental						
1	2	0.276	0.165	0.292	-0.676	0.125
	3	0.347	0.173	0.142	-0.767	0.073
AC Control						
1	2	-0.027	0.306	1.000	-0.742	0.796
	3	0.676	0.327	0.137	-1.496	0.145
BA Experimental						
1	2	0.665	0.317	0.114	-1.435	0.105
	3	0.760	0.373	0.132	-1.667	0.147
BA Control						
1	2	-1.423*	0.377	0.003	0.456	2.390
	3	-1.038	0.586	0.265	-0.464	2.541
BB Experimental						
1	2	0.697	0.318	0.092	-1.470	0.077
	3	0.532	0.320	0.299	-1.310	0.247
BB Control						
1	2	-0.692	0.586	0.747	-0.812	2.197
	3	-0.962	0.739	0.615	-0.935	2.858
BC Experimental						
1	2	0.768*	0.161	0.000	-1.160	-0.376
	3	0.485*	0.198	0.048	-0.966	-0.004
BC Control						
1	2	-0.808*	0.248	0.010	0.171	1.445
	3	-0.346	0.342	0.962	-0.531	1.223

Note. AA= Spoken-form recognition Song A, AB= form-meaning connection Song A, AC= collocation recognition Song A, BA= Spoken-form recognition Song B, BB= form-meaning connection Song B, and BC= collocation recognition Song B.

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To answer the third research question, MANCOVA was used to determine whether the four groups differed significantly in their vocabulary learning gains across the three sections of the test for both songs.

Song A

The results indicated an overall statistically significant difference, $F(9, 365.2) = 2.09, p < .05$, Wilk's Lambda = 0.885, partial $\eta^2 = 0.04$) on the immediate posttest. When the results for different sections of the test were considered separately, there was a significant difference found for spoken-form recognition ($F(3, 155) = 4.74; p < .01$; partial $\eta^2 = 0.086$) with a medium effect size. However, no significant differences were found between groups in the other two sections of the test. Post hoc comparisons using the Bonferroni test for the spoken-form recognition section indicated a statistically significant difference between the control and E5 group ($p=0.002$) with a large effect size (Cohen's $d= 0.90$).

On the delayed posttest, the MANCOVA realized an overall statistically significant difference between the groups on the delayed posttest, $F(9, 365.2) = 3.39, p < .005$, Wilk's Lambda = 0.822, partial $\eta^2 = 0.063$. When the results for different sections of the test were considered separately, there were significant differences with medium effect sizes for spoken-form recognition ($F(3, 155) = 3.50; p < 0.05$; partial $\eta^2 = 0.065$) and form-meaning connection ($F(3, 155) = 5.29; p < 0.005$; partial $\eta^2 = 0.095$), however a significant difference was not found for collocation recognition.

Post hoc comparisons using the Bonferroni test for spoken-form recognition indicated a statistically significant difference between the control group and E1 ($p=0.02, d= 0.69$). The Post hoc comparison for form-meaning connection indicated a statistically significant difference between the control group and E3 ($p=0.008, d= 0.69$). A statistically significant difference was

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also found between E1 and E3 on the form-meaning connection section of the test ($p=0.016$, $d=0.68$).

Song B

The results indicated an overall statistically significant difference, $F(9, 328.7) = 9.05$, $p < 0.001$, Wilk's Lambda = 0.583, partial $\eta^2 = 0.164$. When the results for the different sections of the test were considered separately, a significant difference with a large effect size was found for spoken-form recognition ($F(3, 140) = 13.03$; $p < 0.001$; partial $\eta^2 = 0.222$), a significant difference with a medium effect size was found for form-meaning connection ($F(3, 140) = 4.68$; $p < 0.005$; partial $\eta^2 = 0.093$), and a significant difference with a large effect size was found for collocation recognition ($F(3, 140) = 10.72$; $p < 0.001$; partial $\eta^2 = 0.19$).

Post hoc comparisons using the Bonferroni test indicated a statistically significant difference between the control group and E5 ($p=0.00$, $d= 1.39$), E1 and E5 ($p= 0.017$, $d= 0.97$), and E3 and E5 ($p=0.00$, $d= 0.82$) in the spoken-form recognition section. The results for form-meaning connection section indicated a statistically significant difference between E3 and E5 ($p=0.007$, $d= 0.58$). The results for the collocation recognition section indicated a statistically significant difference between the control group and E3 ($p=0.00$, $d= 1.23$), and the control group and E5 ($p=0.00$, $d= 1.07$).

For the delayed posttest, the results showed that there were no significant differences in learning gains from pretest to delayed posttest among the groups for Song B.

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To answer the fourth research question, Pearson's r correlation coefficients between frequency of occurrence and learning gains for each group (Control, E1, E3, and E5) at each grade level (five and six) were examined for the immediate posttest and delayed posttest in each section of the test. On the immediate posttests, there was a moderate and positive correlation between the frequency of occurrence and test scores for E3 at the grade five level on the spoken-form recognition section of the test, $r = 0.545$, $n = 15$, $p < 0.05$. There was also a moderate and positive correlation between the frequency of occurrence and test scores on the immediate posttest for E3 at the grade six level on the spoken-form recognition section of the test, $r = 0.424$, $n = 22$, $p < 0.05$.

On the delayed posttests, there was a moderate and negative correlation between the frequency of occurrence and test scores for E5 at the grade five level on the form-meaning connection section of the test, $r = 0.392$, $n = 21$, $p < 0.05$. The relationship between frequency of occurrence and test scores were insignificant for all the other groups in the study.

2.07 Discussion

This study expanded on earlier research by providing empirical evidence that incidental vocabulary acquisition can occur through listening to songs. Medina's (1993) study also explored incidental vocabulary learning through listening to songs. However, that study investigated the incidental learning of form-meaning connection through listening to a children's song. The present study provided a more in-depth assessment of the extent to which incidental vocabulary acquisition through listening to songs can occur by measuring learning gains of spoken-form recognition, form-meaning connection, and collocation recognition. Moreover, the songs used in this study may reflect more ecologically valid L2 spoken input because popular songs are more likely to be listened to by learners than children's songs. Furthermore, the effects

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of repeated exposures to a song was also investigated. Research has shown that incidental vocabulary learning is likely to increase through repeated reading (Horst & Meara, 1999), repeated listening (Penno, Wilkinson, & Moore, 2002), and repeated reading while listening (Webb & Chang 2012a). Finally, the relationship between frequency of occurrence of target items encountered in the songs and vocabulary learning was also examined.

3.07.01 Can learners gain vocabulary knowledge through listening to songs?

In answer to the first research question, the results indicated an overall gain in vocabulary knowledge of 3.29% for Song A and an overall gain of 8.67% for Song B from pretest to immediate posttest for the experimental groups. In contrast the mean scores for the control group regressed by 1.21% for Song A and by 7.46% for Song B from the pretest to the immediate posttest. The results from pretest to delayed posttest of the experimental groups revealed a gain of 6.37% for Song A and 4.27% for Song B. The results of the control group from pretest to delayed posttest revealed a gain of 6.91% for Song A and a 5.17% regression for Song B. Since the results from the delayed posttest showed an increase from the immediate posttest across both experimental and control groups, these findings cannot be solely attributed to the treatments. These increases from immediate to delayed posttests may have been caused by a learning effect from taking the immediate posttest (Webb & Chang, 2017; Webb, Newton, & Chang, 2013) or *vocabulary-related episodes* where students may have discussed the vocabulary they heard on the songs after the immediate posttest (Nation, 2011).

It is interesting to note that the incidental vocabulary learning gains were more than twice as large for Song B (8.67%) than Song A (3.29%) on the immediate posttest. There are several reasons that can explain the improved vocabulary learning performance for Song B on the immediate posttests. First, as the students became more familiar with learning through listening

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to songs, their ability to incidentally learn words through listening to songs may have improved (Webb & Chang, 2012a). It is intuitively logical that learning with a new discourse type would improve over time. Moreover, research does suggest that the proportion of vocabulary learning gains does tend to be considerably larger through reading multiple texts than through reading a single text (Webb & Chang, 2015b). Second, differences between the two songs may have also caused the variance in the results. Song A had eight target single word items and eight target multiword items while Song B had 19 single word items and 7 multi-word items on the test. The higher number of items in the second song provided the participants with more chances to learn new vocabulary and more opportunities to demonstrate their learning gains on the test. A third possible reason for the improved performance on Song B is simply that differences between the target words may have influenced vocabulary learning (Laufer, 1997; Webb, 2014; Webb & Chang, 2012a). It is possible that the set of target items for Song B was easier to learn than the set of items for Song A.

From the overall findings in this study we can conclude that learners can incidentally learn L2 vocabulary through listening to songs. The relatively small learning gains may lead some to dismiss the results as not being meaningful. However, research has shown that incidental vocabulary learning gains tend to occur in small increments and that learners need to be exposed to large quantities of input with repeated exposures to vocabulary items for considerable learning to take place (Nagy, Herman, & Anderson, 1985; Webb & Nation, 2017). Earlier studies of incidental vocabulary acquisition have also found small learning gains. Van Zeeland & Schmitt (2013b) found an overall gain of 29% in vocabulary knowledge from listening to text, Horst, Cobb and Meara (1998) found a gain of 10.22% from reading a graded reader, and Peters and

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Webb (in press) found a gain of 8.31% on a test of meaning recall and 13.95% on a test of meaning recognition from watching one television program.

In fact, there is an argument that the size of the gains in this study are substantial. Research has typically investigated incidental vocabulary acquisition with higher proficiency learners with larger vocabulary sizes. Research suggests that there's a direct relationship between vocabulary size and learning gains (Penno, Wilkinson, & Moore; 2002; Peters, Heynen, & Puimege, 2016; Vidal, 2003, 2011; Webb & Chang, 2015a), and that learners with larger vocabulary sizes need fewer encounter with target words for learning to take place (Zahar, Cobb, & Spada, 2001). The findings in the present study indicated that incidental vocabulary learning can occur through listening to songs even when learners have a very small vocabulary size. Research with other discourse types would suggest then that with more proficient learners, the gains made through listening to songs are likely to be greater.

3.07.02 To what extent does listening to songs affect knowledge of spoken-form recognition, form-meaning connection and collocation recognition?

In answer to the second research question, the results indicated that for Song A the experimental groups demonstrated a significant gain of 6.53% for spoken-form recognition and no significant gains/regression for form-meaning connection and collocation recognition from pretest to immediate posttest. Furthermore, for Song B the experimental groups demonstrated a significant gain of 10.97% for collocation recognition between the pretest and immediate posttest. However, they demonstrated no significant gains on the spoken-form recognition and spoken-form meaning connection aspects of vocabulary knowledge for this song.

From these findings, we can conclude that learners have the potential to incidentally learn the spoken forms of single-word items and the spoken forms of collocations through listening to

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songs. The result for single word items is consistent with earlier research. Van Zeeland and Schmitt (2013b) found that learners gained knowledge of spoken form recognition before knowledge of form meaning connection for individual words and that the number of exposures needed to be higher to gain knowledge of form meaning connection than spoken form recognition. Another reason why the participants were unable to gain knowledge of form meaning connection, is that the context in which the target words are encountered may have a large impact on learning this aspect of vocabulary knowledge. Research suggests that students have a better chance of learning new vocabulary items from more informative contexts (Nagy, Herman, & Anderson, 1985; Webb, 2008). Because the meanings of words in songs may be less salient than in many other forms of spoken and written text, it may be that gaining knowledge of form-meaning connection through listening to L2 songs is particularly challenging.

The positive gains found on the collocation recognition section of the test are also consistent with earlier studies. Webb and Chang (2017) explored incidental learning of collocations through different modes of input. They found that EFL students were able to make gains in knowledge of the spoken forms of collocations of 16% through listening to a graded reader. They concluded that listening may play a more important role in gaining knowledge of collocation than single word items. The value of listening to learning collocation might be due to the prosodic forms of collocations (Lin, 2012). This makes collocations more salient during listening than reading (Webb & Chang, 2017). Furthermore, the further emphasis of rhythms and stresses in songs may make collocations even more salient. Perhaps the songs may have the potential to be a valuable source of L2 input for learning collocations.

3.07.03 Does the number of times a song is heard affect incidental vocabulary learning?

In answer to the third research question, the results indicated that E5 significantly outperformed the control group on the spoken-form recognition section of the test for Song A. However, no significant differences were detected on the other two sections of the test between groups for this song. The results for Song B on the spoken-form recognition section of the test indicated that E5 also significantly outperformed the other three groups in the study (control, E1, and E3). Together, the results of the two songs clearly indicates that listening to a song five times may have a positive impact in gaining knowledge of the spoken forms of individual words.

The results for the other two sections of the test indicated that listening to a song multiple times may also increase the other two aspects of vocabulary knowledge. For Song B, E5 significantly outperformed E3 on the form-meaning connection section of the test, and E3 and E5 gained greater knowledge of collocation than the control group.

From these results, we can conclude that repeated listening to songs has a positive effect on learning different aspects of vocabulary items although the variation in findings for form-meaning connection and collocation recognition may be affected to a lesser degree by the number of times a song is heard than spoken form recognition. The results are supported by earlier studies that have shown that repeated reading (Horst & Meara, 1999; Webb & Chang, 2012a), repeated listening (Penno, Wilkinson, & Moore, 2002), and repeated reading while listening (Webb & Chang, 2012a) enhances vocabulary learning as the number of times texts are heard or listened to increased.

3.07.04 What is the relationship between frequency of occurrence and incidental vocabulary learning through songs?

In answer to the fourth research question, the results indicated that in the E3 groups in which the frequency of exposure ranged from 3 to 18, there was a significant correlation between number of exposures and learning gains on the spoken-form recognition test. However, no significant relationships were found in the E1 and E5 groups where frequency of exposure ranged from 1 to 6 and 5 to 30. This finding is consistent with the results of Van Zeeland and Schmitt's (2013b) earlier study of incidental vocabulary learning through listening. They found that acquisition of spoken-form started to occur from around 7 encounters with target words. Thus, in the E1 group the amount of learning that had occurred after six encounters was not much greater than the amount of learning that occurred after one encounter. In addition, Van Zeeland and Schmitt (2013b) found that participants in their study made greater gains in vocabulary knowledge after 11 encounters with target words than after 7 encounters, while no significant differences were found between 11 and 15 encounters. This explains why significant results were found in the E3 groups where the amount of learning for the more frequent words (9 and 18 encounters) were greater than the amount of learning that took place for less frequent words (3 and 6 encounters). Furthermore, the lack of a significant relationship between frequency of occurrence and learning in the E5 groups was perhaps due to a similar amount of learning that took place for the less frequent words (5 and 10 encounters) and for the more frequent words (15 and 30 encounters).

3.08 Limitations and Future Research

Several limitations of this study should be noted. First, there were only two songs used in this study, and the results indicated different learning gains between the songs. Thus, it would be useful to conduct further research with more songs to try to determine which characteristics of songs facilitate learning.

Second, in this study the participants had a very limited vocabulary size. Research investigating incidental vocabulary acquisition through other sources of input suggests a positive relationship between vocabulary size and vocabulary gains (Peters, Heynen, & Puimege, 2016; Vidal, 2003,2011). Thus, in future studies it would be useful to investigate incidental vocabulary learning through listening to songs with participants of different vocabulary sizes to get a better indication of how listening to songs may contribute to vocabulary learning.

Third, in this study to evaluate the relationship between number of exposures and learning gains in a controlled setting, participants were asked to listen to the same song multiple times in one session. This design may be ecologically problematic, because while listeners may listen to the same song multiple times, they may typically do so over time with intervals between listening. Furthermore, outside of the classroom, learners would repeatedly listen to the songs that they enjoy and not necessarily to the songs that others have selected for them. Consequently, in the current study repeatedly listening to a song that was selected for this study may have led to the participants losing focus and interest in the activity. Nation (2007; 2011) suggests that learner's interest in activities and materials used for teaching can affect learning. Thus, in future studies it would be useful to investigate spaced listening to songs where participants are exposed to the target songs over a longer period of time with intervals between listening sessions.

3.09 Conclusion

The present study provided in-depth empirical support for the potential of incidental vocabulary learning through listening to songs. These findings have curricular implications (Medina, 1993). If songs do contribute to second or foreign language acquisition, learners and teachers can use songs as a source of L2 input inside and outside of the classroom to increase vocabulary learning. The repeated occurrence of single word and multiword items within songs, may also make them a relatively effective type of L2 input for vocabulary learning. Moreover, the short length of songs may help teachers to fit them rather easily into a classroom based vocabulary learning program. It would be useful for teachers to train students on how to use songs as a source of L2 input for language learning. For example, teachers can promote word consciousness (Scott & Nagy, 2004) through songs, so that the learners become aware of unknown and partially known words and their characteristics that they are exposed to while listening. This will teach learners about the value of songs in second/foreign language learning and provide them with a source of input that they can easily use outside the classroom. Furthermore, extensive genres of songs (pop, rock, country, etc.) allows learners to take control of their learning and select songs that they find interesting which can further foster their learning (Gieve & Clark, 2005).

Finally, short videos appropriate for class use are available for a vast number of songs. Research investigating incidental vocabulary acquisition from viewing videos indicates that viewing videos provide learners with comprehensible information about target words that can fuel L2 vocabulary learning (Peters & Webb, in press; Rodgers, 2013).

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However, this is a new area of research in second/foreign language acquisition research and there is therefore a need for further investigation of the potential use and benefits of songs in this area.

Chapter 4: Conclusion

This chapter concludes the thesis by providing an overview of the major findings, implications, and direction for future research that were not discussed in the previous chapter.

4.01 Review of findings

Vocabulary learning from songs. Overall vocabulary gains of 3.29% for Song A and 8.67% for Song B were found for the combined experimental groups from pretest to posttest. In contrast the control groups showed a 1.21% regression for Song A and 7.46% regression for Song B from pretest to posttest.

Effects of listening to songs on different aspects of vocabulary knowledge. For the three aspects of vocabulary knowledge measured in this study, participants demonstrated 6.53% gains for spoken form recognition for Song A and gains of 10.97% for collocation recognition for songs B. No significant gains were found for form-meaning connection in either song.

Repeated listening and vocabulary gains. The significant differences between groups based on number of times listening to the target songs were as follows. First, participants in E5 outperformed the control group on the spoken form recognition section of the test for Song A. Second, E5 outperformed the control, E1 and E3 groups on the spoken form recognition section of the test for Song B. Third, on the form-meaning section of the test, E5 outperformed E3 on Song B. Fourth, E5 and E3 outperformed the control group on the collocation recognition section of the test for Song B.

Frequency of occurrence and vocabulary gain. The investigation of the relationship between frequency of occurrence and vocabulary gains indicated that the E3 groups in which

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frequency of exposure ranged from 3 to 18, were the only groups demonstrating a significant relationship.

4.02 Implications and future research

Major implications and directions for future research were discussed in the previous chapter. Nevertheless, to further emphasize the importance of the findings in this study and how they can lead the way for further research in the field of second/foreign language learning, this section will discuss further implications and directions for future research that were not discussed previously.

4.02.01 Direction for future research

While this study offered some insight into the process of vocabulary learning from listening to songs, there is still a need for further research in this area. For example, this study was limited to testing using a multiple choice format. Thus, in future research use of other types of test questions including fill in the blank or short answer questions may provide a more in-depth representation of learning gains.

Another limitation in this study that should be addressed in future research can be drawn from the results of the delayed posttest. The results of the delayed posttest were higher than those of the immediate posttest. Thus, the findings from the delayed posttest could not be exclusively attributed to the learning conditions. Other studies have also revealed that this issue may occur (Webb, Newton, & Chang, 2013; Webb & Chang, under review). Webb and Chang (under review) proposed two solutions for this issue that can be utilised in future studies of incidental vocabulary learning through listening to songs. One, the immediate posttest can be removed, and all participants can be tested at the time of the delayed posttest. This way, the possibility of a learning effect from the immediate posttest is removed. While this solution may be plausible for

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low frequency words that are not encountered between the intervention session and delayed posttest, the possibility of encountering high frequency words between the intervention session and delayed posttest remains. Thus, exclusively depending on the results from the delayed posttest may not be a true representation of the learning gains associated with high frequency words (Webb & Chang, under review).

Second, with larger numbers of participants, all control and experimental groups can be divided into two sections. One section could be tested at the time of the immediate posttest and the other at the time of the delayed posttest. However, access to large number of participants is essential for this method of testing which may not always be possible (Webb & Chang, under review)

4.02.02 Implications

As was discussed earlier, this study was the first to provide in-depth evidence of learning gains through listening to L2 songs. This supports previous claims in the literature concerning the advantages and positive effects of using songs as a source of language input. The study may raise awareness of the factors that can influence the level of learning/teaching success when using songs as a source of language input. This may help to optimize vocabulary learning from songs in classroom use in educational settings and personal use for self-directed learning.

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Appendix A: Overview of Research Procedure

	Week 1	Week 2	Week 3	Week 4	Week 5
	60 minutes	60 minutes	60 minutes	60 minutes	60 minutes
Grade 5 (C.A)	<ul style="list-style-type: none"> • Consent Form • Demographic information form • VLT • Pre-test 	<ul style="list-style-type: none"> • Immediate Post-test for song A 	<ul style="list-style-type: none"> • Immediate Post-test for song B 	<ul style="list-style-type: none"> • Delayed post-test for Song A 	<ul style="list-style-type: none"> • Delayed post-test for Song B
Grade 5 (E1A)		<ul style="list-style-type: none"> • Listen's to song A, Once • Immediate Post-test for song A 	<ul style="list-style-type: none"> • Listen's to song B, Once • Immediate Post-test for song B 		
Grade 5 (E3A)		<ul style="list-style-type: none"> • Listen's to song A, three times • Immediate Post-test for song A 	<ul style="list-style-type: none"> • Listen's to song B, three times • Immediate Post-test for song B 		
Grade 5 (E5A)		<ul style="list-style-type: none"> • Listen's to song A, five times • Immediate Post-test for song A 	<ul style="list-style-type: none"> • Listen's to song B, five times • Immediate Post-test for song B 		
Grade 6 (CB)		<ul style="list-style-type: none"> • Immediate Post-test for song A. 	<ul style="list-style-type: none"> • Immediate Post-test for song B. 		
Grade 6 (E1B)		<ul style="list-style-type: none"> • Listen's to song A, Once • Immediate Post-test for song A 	<ul style="list-style-type: none"> • Listen's to song B, Five times • Immediate Post-test for song B 		
Grade 6 (E3B)		<ul style="list-style-type: none"> • Listen's to song A, three times • Immediate Post-test for song A 	<ul style="list-style-type: none"> • Listen's to song B, three times • Immediate Post-test for song B 		
Grade 6 (E5B)		<ul style="list-style-type: none"> • Listen's to song A, five times • Immediate Post-test for song A 	<ul style="list-style-type: none"> • Listen's to song B, five times • Immediate Post-test for song B 		

Appendix B: Western Ethics Approval



Research Ethics

Western University Non-Medical Research Ethics Board
NMREB Full Board Initial Approval Notice

Principal Investigator: Dr. Farahnaz Faez
Department & Institution: Education/Faculty of Education, Western University

NMREB File Number: 108384
Study Title: Incidental Language Learning through Music

NMREB Initial Approval Date: October 28, 2016
NMREB Expiry Date: October 28, 2017

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Letter of Information & Consent	Control Group	2016/10/27
Letter of Information & Consent	Song A Group E1	2016/10/27
Letter of Information & Consent	Song A Group E3	2016/10/27
Letter of Information & Consent	Song A Group E5	2016/10/27
Instruments	Listening Record Sheet - Received August 12, 2016	
Instruments	Sample Test Questions - Received August 12, 2016	
Other	Letter from TESOL Manager re: Niousha Maneshi - Received for Information	2016/08/05
Other	Overview of Research Procedure - Received August 12, 2016 for Information Only	
Western University Protocol	Received October 11, 2016	
Other	Letter of Approval from School Director - Received for Information	2016/09/30
Other	Verbal Consent Script	2016/10/25
Instruments	Vocabulary Levels Test - Received August 12, 2016	
Instruments	Attitude Survey - Received August 12, 2016	

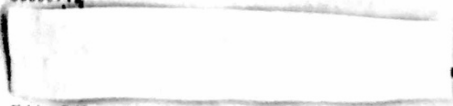
The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the NMREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941



Ethics Officer: Erika Basile ___ Nicole Kaniki ___ Grace Kelly ___ Katelyn Harris ___ Vikki Tran ___ Karen Gopaul ___

Western University, Research, Support Services Bldg., Rm. 5150
London, ON, Canada N6G 1G9 t. 519.661.3036 f. 519.850.2466 www.uwo.ca/research/ethics

Appendix C: Sample Letter of Information Control Groups



Project Title: Incidental Vocabulary Learning Through Music

Principal Investigator:

Farahnaz Faez, Ph.D, Faculty of Education, Western University

Stuart A. Webb, Ph.D, Faculty of Education, Western University

Niousha Maneshi, MA Student, Faculty of Education, Western University

Letter of Information

I am a student at Western University in Canada. I would like to invite you to take part in a research study that will take place during five sessions of your English lessons. This research is trying to find the most effective ways to learn English.

If you agree to participate in the study you will be asked to:

1. Complete a series of questions in pencil and paper form, which will take approximately 30 minutes each time. These tests are great opportunities to practice your English skills.

There are no known or anticipated risks or discomforts associated with participating in this study. Your participation in this study is voluntary and you are free to withdraw from the study at any time, without giving any reason. If you decide not to participate in the study you will still attend class as normal and will carry out similar activities as a part of your regular classroom program.

If you decide to withdraw from the study, you have the right to request withdrawal of information collected about you. If you wish to have your information removed, please let me know.

The study will have no impact on course grades or on successfully completing the course. Your responses to all tasks will be confidential. All data collected for this project will be stored securely so that only the researchers have access to it. The findings from the project will be used in conference presentations, articles to be submitted to journals, and my Master's dissertation.

Representatives of The University of Western Ontario Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research. While we do our best to protect your information there is no guarantee that we will be able to do so. If data is collected during the project which may be required to report by law, we have a duty to report.

INCIDENTAL VOCABULARY AND SONGS

This research will introduce teachers and students of English, a new strategy for effective English teaching and learning.

Participating in this study is an opportunity for you to practice your English language skills and you will be receiving a small gift as a token of appreciation for your participation.

Thank you very much for your time. If you have any question regarding this research project or your participation in the study you may contact me or Dr. Farahnaz Faez.

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Research Ethics.

Yours sincerely,

Niousha Maneshi

This letter is yours to keep for future reference

Appendix D: Sample Letter of Information Experimental Groups



Project Title: Incidental Vocabulary Learning Through Music

Principal Investigator:

Farahnaz Faez, Ph.D, Faculty of Education, Western University

Stuart A. Webb, Ph.D, Faculty of Education, Western University

Niousha Maneshi, MA Student, Faculty of Education, Western University

Letter of Information

I am a student at Western University in Canada. I would like to invite you to take part in a research study that will take place during seven of your English lessons. This research is trying to find the most effective ways to learn English.

If you agree to participate in the study you will be asked to:

2. Complete a series of questions in pencil and paper form, which will take approximately 30 minutes each time. These tests are great opportunities to practice your English skills.
3. Listen to a song for approximately for approximately 15 minutes and answer a series of questions for approximately 30 minutes.

There are no known or anticipated risks or discomforts associated with participating in this study. Your participation in this study is voluntary and you are free to withdraw from the study at any time, without giving any reason. If you decide not to participate in the study you will still attend class as normal and will carry out similar activities as a part of your regular classroom program.

If you decide to withdraw from the study, you have the right to request withdrawal of information collected about you. If you wish to have your information removed, please let me know.

The study will have no impact on course grades or on successfully completing the course. Your responses to all tasks will be confidential. All data collected for this project will be stored securely so that only the researchers have access to it. The findings from the project will be used in conference presentations, articles to be submitted to journals, and my Master's dissertation.

Representatives of The University of Western Ontario Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research. While we do our best to protect your information there is no guarantee that we will be able to do

INCIDENTAL VOCABULARY AND SONGS

so. If data is collected during the project which may be required to report by law, we have a duty to report.

This research will introduce teachers and students of English, a new strategy for effective English teaching and learning.

Participating in this study is an opportunity for you to practice your English language skills and you will be receiving a small gift as a token of appreciation for your participation.

Thank you very much for your time. If you have any question regarding this research project or your participation in the study you may contact me or Dr. Farahnaz Faez.

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Research Ethics.

Yours sincerely,

Niousha Maneshi

This letter is yours to keep for future reference.

Appendix E: Sample Consent Form



Consent Form

Project Title: Incidental Vocabulary Learning through Music

Principal Investigator:

Farahnaz Faez, Ph.D., Faculty of Education, Western university

Stuart A. Webb, Ph.D, Faculty of Education, Western University

Niousha Maneshi. MA Student, Faculty of Education, Western University

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

Child's Name: _____

Parent / Legal Guardian / Substitute Decision Maker (Print): _____

Parent / Legal Guardian / Substitute Decision Maker (Sign): _____

Parent / Legal Guardian / Substitute Decision Maker (Date): _____

My signature means that I have explained the study to the participant named above. I have answered all questions.

Print Name of Person
Obtaining Consent

Signature

*Date (DD-MMM-
YYYY)*

Appendix F: Script for Verbal Consent from the Participants



Script for Obtaining Verbal Consent from the Participants:

1. Do you confirm that you have read the Letter of Information and have had all questions answered to your satisfaction?

YES NO

2. Do you agree to participate in this research?

YES NO

Curriculum Vitae

Name: Niousha Maneshi

**Post-secondary
Education and
Degrees:** Western University
2009-2014 B.A.

Western University
2015-2017 M.A.

**Related Work
Experience** TESOL Instructor
XploreAsia,
2016

Secondary School English Teacher
Kuengnai-Pittayakarn School
2014-2015