

EFFECTS OF SINGING ON THE VOCABULARY ACQUISITION OF  
UNIVERSITY JAPANESE FOREIGN LANGUAGE STUDENTS

BY

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degree of Doctor of Philosophy.

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### **Abstract**

Research shows that there is a relationship between music and memory (Salcedo, 2002). This study examined the effects of singing on the acquisition of foreign language vocabulary. There were approximately 30 students participating from two sections of a Japanese foreign language class at the University of Kansas. All were in their third semester of Japanese language instruction. An experimental group was taught vocabulary along with a melody, whereas a control group was not exposed to the melody. Specifically, the dependent measure compared the number of items that the experimental and control groups correctly recognized on tests. The participants took a pretest and two posttests of their knowledge on transitive and intransitive verbs. After conducting a pilot study, a decision was made for the present study to lengthen the amount of time between the two posttests since the pilot study results were trending towards significance for the second posttest. The present study results showed statistically significant differences between the two groups on their delayed recognition, but no difference on their immediate recognition. Students in the singing group completed a questionnaire that was intended to obtain their perceptions about the effectiveness of lessons with music. Students reported that they enjoyed them and experienced the Din effect. This study found that singing could be an effective learning source for vocabulary acquisition. Implications for teaching and research are explored.

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## Table of Contents

Abstract .....	iii
Acknowledgments .....	iv
Table of Contents .....	v
List of Tables .....	ix
List of Figures .....	x
Chapter I.....	1
Introduction.....	1
Rationale. ....	2
Investigation of strategies. ....	3
Statement of purpose.....	7
Research questions.....	7
Chapter summary. ....	8
Chapter II .....	9
Related Literature.....	9
Cognitive similarities between language and music.....	9
Music, brain, and second language learning (the whole brain approach).....	11
Effective use of music in second language instruction. ....	13
Suggestopedia and language acquisition. ....	16
Music for strengthening accuracy and prosody. ....	18
Music as mnemonic device.....	20
Summary of studies and conclusions.....	22
Chapter III.....	25

Research Methods.....	25
Instrument.....	25
Selection of content for tests.....	25
Definition of transitive verbs and intransitive verbs.....	26
Transitive/intransitive verb pairs.....	27
The teaching material and its development.....	28
Design.....	29
Variables.....	29
Data analysis.....	29
Null hypotheses.....	29
Pilot study participants.....	30
Present study participants.....	30
Pilot study procedures.....	31
Present study procedures.....	34
Pilot study results.....	35
First posttest.....	35
Second posttest.....	36
Demographic information.....	37
Three types of items on the tests.....	41
Questionnaire.....	43
Establishing test validity and reliability.....	44
Pilot study conclusion.....	47
Changes from the pilot study to the present study.....	48

Chapter summary. ....	49
Chapter IV.....	50
Results.....	50
First posttest. ....	51
Second posttest.....	51
Demographic information. ....	53
Two types of items on the tests. ....	57
Questionnaire. ....	59
Establishing test validity and reliability. ....	61
Present study conclusion.....	64
Comparison of pilot and present study findings. ....	65
Chapter summary. ....	65
Chapter V.....	66
Discussion.....	66
Overview: Answers to research questions of the present study. ....	66
Comparison with results of previous studies. ....	67
Implications for foreign language teachers.....	68
Limitations of the present research. ....	69
Recommendations for further research. ....	71
Final conclusion. ....	73
References.....	75
Appendix A HSCL Approval.....	81
Appendix B Informed Consent Form.....	83

Appendix C-1 Pretest (Pilot Study) .....	86
Appendix C-2 First Posttest (Pilot Study) .....	88
Appendix C-3 Second Posttest (Pilot Study) .....	90
Appendix C-4 Pretest (Present Study) .....	92
Appendix C-5 First Posttest (Present Study) .....	94
Appendix C-6 Second Posttest (Present Study) .....	98
Appendix D-1 Song .....	100
Appendix D-2 English Translation of the Song .....	102
Appendix E Lesson Plan .....	104
Appendix F-1 Correlation Matrices for Three Tests (Pilot Study) .....	107
Appendix F-2 Correlation Matrices for Three Tests (Present Study) .....	109

## List of Tables

Table	Page
1 Eight Transitive – Intransitive Verb Pairs .....	32
2 Means and Standard Deviations for Pre- and Post-Test Scores .....	37
3 Results of Analysis of Covariance for Two Post-Test Scores .....	37
4 Students’ Demographic Information .....	38
5 Correlations of Students’ Demographic Information with Pre- and Post-Test Scores .....	39
6 Results of Analysis of Covariance for Two Post-Test Scores, Considering Students’ Demographic Information .....	41
7 Means and Standard Deviations for Three Types of Test Items for Pre- and Post-Tests .....	42
8 Means and Standard Deviations for Pre- and Post-Test Scores .....	53
9 Results of Analysis of Covariance for Two Post-Test Scores .....	53
10 Students’ Demographic Information .....	54
11 Correlations of Students’ Demographic Information with Pre- and Post-Test Scores .....	55
12 Results of Analysis of Covariance for Two Post-Test Scores, Considering Students’ Demographic Information .....	57
13 Means and Standard Deviations for Two Types of Test Items for Pre- and Post-Tests .....	59

**List of Figures**

Figure	Page
1 Means of Three Tests by Group.....	47
2 Means of Three Tests by Group.....	64

## Chapter I

### Introduction

The acquisition of a second/foreign language is a complex and ongoing process. When beginning the pursuit of a second/foreign language, the learner is usually unaware of the magnitude of the endeavor. Acquiring a second/foreign language seems, at first glance, to merely involve the learning of some new grammatical rules, the memorization of a new set of vocabulary words, and probably some work on pronunciation. However, all language acquisition is quite complex, and the learning of a second/foreign language appears to be even more complex than the acquisition of one's native language. The failure rate for near-native fluency of second language (L2) acquisition compared with the success rate of first language (L1) acquisition seems to indicate that there are some aspects of second/foreign language acquisition which make it more difficult for the average learner. For instance, Barinaga (1995) reported that the putamen, part of the basal ganglia in the brain, was activated when bilinguals who started learning an L2 around seven years old spoke their L2, while this does not happen when speaking their L1. This signifies that even bilinguals who acquired their L2 in childhood need extra brain activity to speak their non-native languages.

Likewise, learning an L2 as an adult is more complex than learning an L1 as a child because adults have more affective problems (related to the affective filter), physiological problems, and L1 transfer. For example, children have a stronger motivation to learn their L1 because they need the language to be able to communicate to interact with their world, while adults do not have to learn their L2 to survive, especially if they are in a country where their L1 is widely spoken or is an official language. They do not have pressing needs, unlike children learning their L1 to be able to talk to their parents, because they already have their own L1. So,

adult L2 learners need motivational tools. In order to help adult students successfully learn a foreign/second language, teachers need to use effective teaching strategies and models.

**Rationale.** To acquire or learn any language, memory is necessary at every level. For example, mastering all four sub-skills of a language (speaking, reading, writing, and listening) requires internalization, and L2 learners must learn vocabulary, grammar rules, pronunciation of the target language (TL), and cultural appropriateness of the society of the TL. When learning an L2, using one's memory is involved, otherwise one cannot use it to speak, read, write, and listen. So, L2 learners need not only motivation to internalize the language, but also memory aids or memorization strategies for both short- and long-term memory. They also need aids to help them recall or retrieve TL information to which they have previously been exposed, as they reach to assimilate their knowledge and become communicatively competent.

Music can reach people's minds easily and help people receive an encoded message. The present study is about using music to help academic achievement in second/foreign language learning at the university level because music reaches people both intellectually and emotionally. The researcher's interest in this study came from a variety of personal experiences that indicate that music seems to facilitate learning. The literature cited also supports this. As a pianist, the researcher knows that music can touch people's minds and move them. Music can relax and calm people (Lozanov, 1978; Mora, 2000) or stimulate and energize them. The music educator or therapist uses music in a variety of ways. For instance, music can be used as a reward (Wolfe & Hom, 1993), as a cue for movement (Staum, 1983), as well as to help students learn or modify their behavior (Brownell, 2002; Standley, 1996). As a piano teacher, the researcher taught not only music theory and history but also other skills in musical contexts. For example,

while teaching kindergartners piano lessons, she simultaneously taught them how to count numbers including fractions through music rhythm (Demorest & Morrison, 2000).

The subject of English is also of interest to this researcher. The researcher took a mandatory English as a FL course for six years in Japan. Even though the researcher studied English hard, and her grade in the course was good, the researcher did not remember anything from the English course several years later. So, the researcher had to start over learning English when she decided to study music in the USA. This might be caused by the teaching approach/method used in the English course, by a serious classroom atmosphere where students were fearful of giving the wrong answer, and/or by the instrumental motivation of studying the subject for a university entrance exam. The six years of English education at Japanese junior and senior high schools did not work well as evidenced by the researcher being an incompetent English speaker/writer.

***Investigation of strategies.*** The researcher believes that a teacher's job includes making learning less challenging to students by making difficult tasks easier, using helpful teaching strategies. A teacher's job also includes making lessons as enjoyable as possible to encourage students to continue learning.

Several educators have found music as a motivational tool for learning L2s (Abrate, 1983; Brady, 1980; Gatti-Taylor, 1980; Little, 1983). For example, Shtakser has speculated that students who study a foreign language (FL) only because it is a school requirement or preparation for an entrance examination enjoy listening to pop songs in the TL. If they like a song, they might become interested in studying the FL because they want to know what the lyrics say. After understanding the meaning of the song lyrics, students may be interested in examining other songs by the same singer or band. Students listen to pop music every day and

therefore, using pop music in FL classrooms is likely to motivate students' active learning, especially when students are given an opportunity to contribute their knowledge of music to their FL classes (2001). Music can naturally encourage people to start to explore. However, not many empirical studies have investigated a link between music and motivation. In one example of such kind of study, Chu (2004) examined 446 college students and eight teachers in Taiwan to investigate their perceptions and expectations of learner autonomy. The results point to the need for learner autonomy in college conversation classrooms of English as a FL and revealed that Taiwanese students who spent seven hours in a typical week listening to English music for pleasure had more independence and responsibility in learning English than those who spent less than three hours per week. The difference was statistically significant. Therefore, the study supports the idea that music is, in fact, a motivational tool that encourages learner autonomy and increases independent learning and responsibility of the students to learn their TL. In conclusion, music can motivate students to learn their TL and can also help them see another culture through its music (Brady, 1980; Gatti-Taylor, 1980; Little, 1983; Melpignano, 1980; Shtakser, 2001).

As mentioned above, effective teaching strategies and models are important for foreign/second language educators. Music should be used as a strategy to make language teaching effective and improve language acquisition. For foreign/second language educators, using students' preferred music in lessons motivates students to be interested in the foreign/second language as a fun subject (Little, 1983). According to Little (1983), using students' preferred music motivates their participation and commitment in these classes. Music that they are familiar with has more power to encourage emotional reactions, which may then be followed by increased participation (Gatti-Taylor, 1980; Little, 1983). Asking students to

choose or bring their preferred music produces the best results in learning (Gatti-Taylor, 1980). Foreign/second language teachers have tried to identify effective uses of music in their classroom in order to help students more efficiently and effectively achieve higher language proficiency (Abrate, 1983; Ayotte, 2004; Brady, 1980; Gatti-Taylor, 1980; Hama, 2002; Hirano, 2007; Little, 1983; Melpignano, 1980; Salcedo, 2002; Staum, 1987; Wilcox, 1995).

Not only does music motivate students to be interested in an L2 as a subject, but they are drawn to music, which aids their memory. People remember what they pay attention to; they pay attention to what they want (Bolles, 1988). Music draws people's attention. There is a lot of information in the literature review to support the effects of music on memory. The teachers' task is not only teaching memory techniques, but also motivating the students to want to pay attention. When listening to a foreign song, trying to understand the whole song might be overwhelming. However, a student may pick up any part that contains a word that the student already knows. As a result, a student pays attention to that part, and this motivates the student to explore other larger parts of the music. In this way, music is helpful for memory in foreign/second language learning.

Furthermore, music's features help to enhance students' learning. The holistic properties of music support people's use of both sides of their brains when listening to a song. People double encode new information when learning with music; they encode the melody with the right brain, while encoding lyrics with the left brain. As a result, the information is not as easily forgotten (Schuster & Gritton, 1986). Also, teachers can use music as a device to help students learn by timing classroom activities with songs/music, since music proceeds in a time line.

According to established research, most L2 teachers and experts have approved music as a motivational tool, while its use as a memory aid lends itself to more language production. In the present study, music is not only a motivational tool, but also a mnemonic device. Research indicates that music is useful not only for memorizing new information (short-term memory) but also for the retention of information (long-term memory).

Many research studies show that students memorize better with music than without music (Abrate, 1983; Brutton, Angelis, & Perkins, 1985; Hirano, 2007; Little, 1983; Salcedo, 2002; Wilcox, 1995; Wolfe & Hom, 1993). For example, people seem to be able to recall the lyrics of a song that they learned 40 years ago (Salcedo, 2002). Most adults can sing children's songs that they learned during childhood (McChesney, 1985). Lyrics memorized with music are less easily forgotten than text alone (Hirano, 2007). People can learn new information easier with music. Learning the alphabet with an ABC song is easier than without it. People can memorize more words with music. Some language teachers help students enhance their memory by using music.

Music also works as a facilitative retrieval cue (Wilcox, 1995). Language acquisition occurs best in a meaningful context, such as within a musical context (Crawford, 2001; Omaggio, 2001). The communicative situation provides a setting in which the meaning can be easily discerned (Snow, Met, & Genesee, 1989). The meaning becomes readily available by contextual cues when learners encounter a similar context later.

A memory model is a cognitive model, but this researcher uses a social model as well. When students learn in a variety of contexts through interaction with other students, with a teacher, or with music activities, it helps students enhance memory (Dewey, Vygotsky, cited in

Phillips & Soltis, 1998). In the present study, the students' memory would be enhanced by interacting with a song.

The aforementioned studies together confirm that music is beneficial to L2 acquisition. However, these findings haven't been confirmed in empirical studies of learning Japanese at the college level. There is little experimental evidence for music as a memory aid. This might be one reason why some teachers of Japanese are hesitant to use music in their university FL classrooms. The present study has attempted to find the best way to memorize new information with music in an experimental study; it uses music as a mnemonic device or teaching strategy in the university FL classroom.

**Statement of purpose.** The purpose of the present study is to examine the effects of singing on FL vocabulary retention by comparing the number of items correctly recognized by university students assigned to a singing group with those in a non-singing control group. This study investigates whether exposure to targeted vocabulary in conjunction with music causes better vocabulary retention/retrieval of these vocabulary words than when vocabulary is taught without music in FL classrooms. Do university students retain vocabulary associated with a particular song better than without it?

**Research questions.** This study answers the following research questions: (1) Do university level students of Japanese remember target vocabulary with immediate recognition better when it is introduced in the context of a song? (2) Do university level students of Japanese remember target vocabulary with delayed recognition better when it is introduced in the context of a song? It was hypothesized that the singing group would score higher than the non-singing control group, since the singing group has received language instruction with a song.

**Chapter summary.** This chapter identified numerous benefits of using music to aid L2 vocabulary acquisition. Music has a lot of potential to help L2 learners. While educators know that music can engage L2 students in language learning because it is fun for them, more empirical studies are needed to understand the relationship between music, motivation, and memory. While music as a motivational tool has been established, music as a memory aid leads to more language production. Many experts also suggest that students memorize better with music than without music. A few empirical studies have suggested the effectiveness of music on vocabulary acquisition. There is a lack of experimental research about using music as a memory aid for both short- and long-term memory. The present study is one of the experimental studies which investigate this point. To address this, Chapter 2 will present a review of relevant research pertinent to answering the research questions. Implications for language professionals will also be identified and discussed.

## Chapter II

### Related Literature

This chapter will review earlier literature that focused on educational usage of music for L2 learners. Music helps language learning in various ways as discussed in the previous section. In order to understand the difference between teaching language with music and without music, this chapter will review similarities and differences between the characteristics of language and of music, the use of the whole brain approach with music to improve language learning, and other applications of music in foreign or second language instruction.

**Cognitive similarities between language and music.** Some researchers focus on the larger relationship between language and music. Besson and Friederici (1998) noted that French philosopher Jean Jacques Rousseau (1712-1778) believed that language and music shared a common origin. The authors attempted to determine similarities and differences between language and music. The authors argue that both language and music share the process of segmenting information into groups. They found that both language and music have multiple levels of representation: language has phonology, prosody, lexicon, semantics, syntax, and pragmatics; and music has melody, harmony, and rhythm. Both language and music provoke expectations in people's minds. In both language and music, there is a similar expectation of the sequence or the order. For example, people expect a certain order of words in language, while people expect a certain order of sound in music. Both language and music require the use of the general/top-down and specific/bottom-up processes in perception and comprehension. However, one area of difference between language and music is that people can interpret language by referring to rules and traditions, while when interpreting music, listeners understand

each sound as it is connected to the previous sound. Being aware of the relationship between language and music is helpful to the design of the present research.

Other researchers look more closely at the details of the relationship between language and music. Mora (2000) contrasts language and music and briefly discusses hearing ability in different stages of life from before birth to adulthood. She concludes that a teacher should emphasize melodic/prosodic features when presenting a new structure in a FL classroom. The “melodic approach,” which is a teacher’s emphasizing melodic/prosodic features of language and the use of a well-known melody to introduce information and to speak/sing a phrase from the information to the melody, is helpful for intermediate and advanced students to improve their pronunciation. Additionally, she states that playing music in the classroom makes students become more quiet and relaxed (often called the lowering of affective filters), and that songs are good tools for teaching lexical patterns and grammar as well.

Murphey (1990) introduces *the song-stuck-in-my-head (SSIMH)* phenomenon and maintains that songs may put the Language Acquisition Device (LAD) in action, or become an instrument of the LAD in language development. He also recognizes the similarity of Krashen’s Din to the SSIMH phenomenon, the Din being the involuntary rehearsal of a FL in one’s mind (Murphey, 1990). Krashen (1983) hypothesizes that the LAD activates the Din when the conditions of “comprehensible input” and “i + 1 structure” are met. Murphey discusses how subvocal rehearsal (reading or listening) activates the LAD, which activates the Din. Thus, comprehension occurs, and then, reading and speaking (production) occur. There is a discussion about the risk and benefit of activating the Din deliberately. Murphey (1992) further examines the characteristics of popular songs and reinforces the idea that music and songs may facilitate stimulation of the LAD into the Din mode of involuntary language rehearsal.

This particular study is important because Murphey and Krashen are trained as linguists, not as classroom teachers or music specialists, yet they see the value of songs in language acquisition.

**Music, brain, and second language learning (the whole brain approach).** Another effective use of music in instruction is the whole brain approach. The idea behind this approach is that training the right brain enhances the function of the left brain where language/vocabulary learning occurs.

Bancroft (1999) argues that schools tend to emphasize verbal activities that stimulate the left brain and neglect activities that appeal to the right brain. If educators want to reach the full potential of students' cognitive abilities, they should use techniques that make use of the right brain to complement the techniques for the left brain (Williams, 1983). Research on teaching, wherein multiple areas of the brain are involved, has shown that both learning rates and retention can be improved significantly (Schuster & Gritton, 1986).

According to Bancroft, an increase in cortical activity in the left brain is usually observed for linguistic symbols like language, whereas, an increase in right hemisphere activity is generally observed when listening to music (Schuster & Gritton, 1986). Since music is mainly processed by the right brain and language by the left, both hemispheres are activated, as well as connected, by language instruction with music. Music, thus, can be used as an aid to learning because the right hemisphere absorbs the melody while the left learns the lyrics. Music therapy has revealed that some patients who had lost their speaking ability were able to relearn to speak and remember simple phrases when the phrases were presented musically (Williams, 1983). For Bancroft this research signifies that if students learn verbal information with a song, they may recall it more easily. According to Xia and Alexander (1987), activities that incorporate

the right brain, such as music, visualization exercises, and physical activities, can be used to improve language learning and retention.

Similarly, in his discussion of general theories of brain functioning, Schuster (1986) expands Lozanov's theory that using multiple sensory inputs (auditory, visual, and/or motor) improves memory and accelerates memorization. Teachers should emphasize the "interactive contributions of the right and left hemispheres to master a given skill" (Schuster & Gritton, 1986, p. 81), and use various modes of presentation in the classroom. He suggests that verb conjugation/vocabulary, for example, should be taught orally, visually, and through physical movement. These approaches, also known as Suggestopedia, will be discussed more extensively below.

The Contemporary Music Approach (CMA) (Anton, 1990) is also one of the whole brain approaches. Anton suggests CMA as "one of the most effective memory aids" (p. 1169). He developed 10 songs to teach Spanish grammar, to supplement teaching from the textbook. In CMA, students sing along, memorize lyrics, and then write new lyrics for the same melody. He suggests spending about three weeks on each song. The distinct rhythm of each song serves as a retrievable cue for grammar structure in CMA. The results of a questionnaire answered by 200 students at the University of Akron showed that 93% enjoyed learning by CMA; 98% felt that CMA helped them learn the language; 92% played the songs for family and friends, and 50% listened to the songs during their leisure time. According to Willis and Mason (1994), Anton demonstrates that CMA accentuates the advantages of using music, especially for recalling grammatical structures. People who study brain functioning consider multi-sensory inputs important in improving memorization and therefore they should be used in the language

classroom. This is why some people see value in using music for developing other skills even if they do not see any innate value in learning music itself.

**Effective use of music in second language instruction.** Utilizing music in a FL classroom is a common teaching methodology. Many researchers argue for the effectiveness of music in improving academic achievement. Abrate (1983), Bancroft (1999), Brady (1980), Gatti-Taylor (1980), Little (1983), Melpignano (1980), and Pyper (2005) describe applications of songs/singing in TLs for the foreign or second language classroom. (Later, each author's ideas will be discussed in detail.) They use music to help teach pronunciation, vocabulary, listening comprehension, grammar, conversation and composition skills, as well as to improve the understanding of history and to increase insights about culture. Most of them developed criteria for song selection: start with slow-tempo songs; play foreign versions of familiar melodies; use short songs with repetition for familiarity; determine students' mastery of the TL; use musical accompaniments that do not interfere with lyrics; use songs that are popular, meaningful, and age appropriate to students; use songs that are catchy and therefore easily remembered; use a singer with clear enunciation, normal speech, and normal word order, and use high quality recordings. They also discuss music activities: listening to a song; singing along or acting out lyrics; fill-in-the-blank exercises; matching exercises between new vocabulary and synonyms, antonyms, or short definitions; incorporating dictionary work to look for different forms of a word; and using music for discussion topics. They recommend that teachers prepare materials such as an annotated text with a translation of difficult words, insertion of punctuation and phonetic marking, a short biography of the composer, and questions to be discussed in the class. They state several benefits of using music in the language class:

1. Music draws students' attention and provides variety, interest, and fun so that it makes learning more enjoyable and increases motivation. All of these aspects lower affective filters.
2. Lyrics, especially of pop/rock, are native, casual, and dialectical language, unlike that in textbooks. The informality gives students experience with natural use of the second/foreign language.
3. Songs present cultural situations and points of view.
4. Music, especially melody, offers a memory aid and learning context, and music is often stored in long-term memory.
5. Popular songs make grammar study interesting and relevant, so students can see the value of learning grammar.

Among them, Brady (1980) uses opera to teach listening skills to intermediate and advanced students and as a motivational tool in the high school FL classroom. He concludes that this activity is useful for both teaching language skills through culture, and cultural understanding through language. Abrate (1983) introduces listening to popular songs for teaching vocabulary, listening comprehension, grammar, conversation/composition, history, and culture in the FL classroom. Using songs helps students to learn poetic rhythm and meter, and the songs become not only a pedagogical tool, but also a text for studying literature. Since many students do not like to read but do enjoy singing, it becomes a way for them to learn literature better. Little (1983) introduces listening to pop/rock in order to teach vocabulary, idiomatic expressions, grammar, pronunciation, and culture in the high school ESL classroom. He concludes that since most students like and are accustomed to pop/rock, if they can listen to it in school, they view lessons as more fun and as more understandable. In this way, students get

more interested in learning about language. The study does not comment on the limitations of using pop/rock, such as incomplete sentences, profanity, and nonsense phrases such songs contain.

Also on this topic, Melpignano (1980) introduces the transcription of rock lyrics to advanced students for improving listening comprehension in the college FL classroom. Gatti-Taylor (1980) examines whether or not popular songs facilitate a transition between elementary and intermediate college courses, as well as a progression from structured exercise to free speech and composition. The results show the effectiveness of using music. The students reported that learning a song gave them more insight into language and culture, which encouraged more participation in class. The author concludes that songs facilitated the transitional nature of the intermediate level course. This article would have more credibility if the author had clearly reported the number of participants, their gender, and their age.

Another study focusing on college students and FL learning was Pyper's (2005) study. He examined 48 college students enrolling in an intermediate Spanish class. The goal of this study was to see the students' perception of the language learning contexts and of the emotional and cognitive effects of musical modes of instruction. The majority of students were taking the FL course merely to fulfill a college requirement and uncomfortable in the classroom. The results showed that music activities tended to motivate students to participate in the course, even though the students did not perceive the music activities as the most helpful classroom activity. Most students reported experiencing playback (the Din) or remembering words or phrases from songs outside of class time and preferred familiar songs to new tunes. Also, both singing and listening activities helped some students learn grammatical structures. If students do not see a direct correlation between classroom activity and course goals, they will not likely assign

significant value to the activities. Students tend to gravitate more towards activities which are clearly connected to their personal success on assignments, rather than to activities which are solely directed towards the long-range goal of L2 fluency. Students may struggle to connect the value of music activities with their success on grammar-based tests and quizzes. The present study adopts some ideas from Pyper and uses a song created for the specific purpose of learning target vocabulary, instead of using an authentic Japanese song, in order to enable students to perceive the relevance of a music activity to Japanese course goals.

Unlike Pyper, Bancroft (1999) takes another approach and suggests the effectiveness of singing for memorization. Singing can eliminate “logical barriers” that students face in learning because it can return students to a more playful state. She also highlights the characteristics of songs which tie a language to a real-life context. This whole area of investigation provides a useful idea of effective and practical ways of incorporating music activities in the classroom.

***Suggestopedia and language acquisition.*** Suggestopedia, as mentioned above, is a whole brain approach to FL teaching, developed in the 70s by the neuropsychiatrist and psychotherapist, Georgi Lozanov. This approach has become widely known as “Super learning” or “accelerated learning” (Kussler, 2001). Bancroft states that the principal theoretical elements of Lozanov's Suggestopedia are “derived from the idea of unconscious mental activity, in the sense of stimuli directed toward, and absorbed by the unconscious” (Bancroft, 1999, p. 34).

Suggestopedia follows three basic assumptions: (1) If there is joy, there is learning, (2) When both sides of the brain are used simultaneously, learning improves, and (3) Tapping each student's unique potential helps learning to flourish (Rokofsky, 2004). Suggestopedia practitioners believe in using relaxation exercises to lessen students' anxieties, which might

block learning. The exercises use visual images, music, rhythmic patterns, dialogues, and translation practice (Erlendsson, 2001). Some techniques increase memorization and motivation. These techniques combine audio (listening to a dialogue read out loud by a teacher) and visual (written text) to achieve double encoding. Suggestopedia also uses inner speech (inner repetition of words/phrases), which is similar to Krashen's subvocal rehearsal (Bancroft, 1999). Importantly, music, especially rhythm, is central to learning in Suggestopedia. Lozanov used rhythm to relax students and to organize his lessons (Hsieh, 2001). Gaston (1968) also mentions that making words rhythmical and memorable is one of the functions of music. According to him, people remember words longer when they are patterned to the rhythm of a melody, rather than when they are not. Melodies are usually remembered longer than the words of a song. An example of this phenomenon includes the ability to remember an advertising jingle.

Studies show that, in the Suggestopedia classroom, students' physical and emotional reactions to language lessons include many aspects. For example, scientific data show that there are changes in the brain waves, and electroencephalographic recording shows that alpha waves increase, while beta waves decrease during the concert session of a Suggestopedia procedure. Pulse rate and blood pressure also decrease. Based on observation, students show surprisingly low signs of fatigue, stress, or strain after a four-hour-class period. Questionnaires revealed personal satisfaction with the class and improvement in mental and physical health (Bancroft, 1999). Lozanov and his colleagues believe that through the use of this method, vocabulary and grammar were absorbed more easily and without conscious effort. Vocabulary learning normally requires effort for memorization. Because the students' concentration was enhanced, their memorization of target materials was accelerated. Students could recall verbal

knowledge on tests up to a year after the course was taken (Bancroft, 1999). Furthermore, experimental designs have shown that Schuster's SALT method, which is a variant of Suggestopedia, produces a 2 to 3 times greater FL achievement than conventional language instructional methods (Schuster & Gritton, 1986).

After Suggestopedia was established, other people started to adopt it and build on it. For example, Kohler (2000) investigated the effects of his own modified version of Suggestopedia on teaching German as a FL. One group of university students learned three kinds of vocabulary (noun, verbs, and function words) in a text. In one group, the text was read out loud by the tester who was accompanied by music; in the other group, the text was spoken to the students without music. The results showed that the music group improved more significantly over the three days than the non-music group did. The music group was better at two of three kinds of vocabulary. Each type of vocabulary was learned at a different rate. Students performed better on recognition task sections of tests (multiple choice) than on recall task sections of tests (fill-in-the-blank). The researcher concluded that Baroque/classical music positively affects FL acquisition.

Suggestopedia lowers learners' affective filters, and therefore is useful in improving receptive skills. Also, it works as a memory aid, but is not helpful for production or communication skills. One aspect of Suggestopedia, enhancing memory, is applicable to the present study.

***Music for strengthening accuracy and prosody.*** Hama (2002) examines the effect of singing and instrumental playing, paired with chant reading on ESL prosody development (the emphasis and intonation of speech) among university students. The results indicate significantly higher posttest scores in stress word accuracy, rhythmic accuracy, and overall

prosody. Score differences from pretest to posttest are significantly higher in rhythmic accuracy than in word stress accuracy. This study would have had a higher generalization if the number of participants had been greater and the range of participants had been broader. It would have been beneficial if the researcher had examined the correlation between the number of years the participants had studied in the USA and their speech prosody skills, as well as the correlation between participants' nationalities and speech prosody skills to see if there was a particular pattern between the two variables, respectively.

Another study examining ESL students and prosody showed that singing can help students with intonational pattern issues. The purpose of Staum's (1987) study was to determine the effect of music as an intonational cue in improving the speech prosody of ESL students. International students enrolling in the Intensive English programs of two separate universities participated in the experiment for eleven days. Sentences were both sung and spoken in the treatment. The results indicated that accuracy in intonational speech patterns increased when sentences were paired with music. However, students were unable to generalize accurate verbal inflection when given unfamiliar sentences with the same linguistic structure.

Hirano (2007) examined Japanese, which is a pitch-accent language, instead of English, which is a stress-accent language. Her study investigated the effects of the melody pitch of a song on students' FL speech pitch acquisition. The experimental group practiced two Japanese sentences with a song, and the control group practiced by reciting them without a song; both groups practiced twice a week for three weeks. The results indicated no group difference in their pitch improvement between the experimental group and the control group. In a perception study, where 34 native Japanese speakers judged the fluency of the students' reading ability, both

groups improved from the pretest to the posttest (Hirano, 2008). In her discussion, Hirano suggests that, “since it may be difficult for non-native speakers [of Japanese] to memorize [prosody], composing melodies where musical notes follow the phonological pitch and intonation in a sentence may be beneficial [to the learning of Japanese]” (2007, p. 59). Also, she stated that utilizing music in the FL classroom can motivate learners to study the language outside the classroom (Hirano, 2007).

Wilcox (1995) also investigated the effects of classroom singing activities. Her focus was on prosodic memory for the pronunciation of ESL adult students attending a community college. In this study, a singing pattern was used to help create the prosody of the language. Even though the results showed no group difference in their vocabulary learning or pronunciation clarity between the singing group and the control group, the students in the singing group reported more enjoyment and pleasure in the classroom singing activity than they would have had in normal classroom activities. The repetition of singing phrases allowed the students to continue practicing the target vocabulary. Some students at the higher English proficiency levels experienced residual learning (the Din effect). Wilcox concluded that the parallel structure of the language and classroom singing helped strengthen memory anchors for L2 learners. The music cues from classroom singing reminded the students of memory anchors.

***Music as mnemonic device.*** Other researchers have also investigated the use of music in the second/foreign language classroom, but have focused on music as a mnemonic device instead of merely a classroom activity. Ayotte (2004) investigated university students’ acquisition of verb forms through song. Her study followed 46 students who were enrolled in the same third semester French class but in two separate sections. She compared the grammatical accuracy on the written examinations between the two groups. One group heard

commercially recorded songs in French, and the other group heard the same songs as poems (recorded speech), that is, song as input versus poem as input. In the study, the experiment was conducted during regular class time. The students took the pretest 13 weeks prior to the classroom treatment, which spanned two lessons, during which students learned a total of three songs, and each song focused on one verb form. Students took a posttest (termed immediate) on the day following the treatment. The students attempted to fill in the blanks with an appropriate conjugation of a given verb. Three weeks later, students took the delayed posttest, which was identical to the immediate posttest. Even though the results of the pilot study showed more grammatical accuracy on all verb forms by the song group than by the poem group, the results of the main study showed no differences for any of the verb forms between the groups. Both groups reported an appreciation and a desire to use the alternative form of the textbook (songs for the song group, poems for the poem group). However, Ayotte concluded that listening to songs in a FL classroom may not aid the students in their learning of the verb forms.

The fact that this research did not have students sing a song (no output) might be a reason for the results indicating songs' strong limitations in Ayotte's study. Also, it might be too much information to present three songs or poems with three verb forms in two consecutive lessons. This overload might lead to the results that indicate the limitations of the use of songs. In the present study, the researcher presents only one verb form (transitive/intransitive verbs) and has participants not only listen to, but also sing, a song.

Salcedo (2002) examined the effects of songs on text recall and involuntary mental rehearsal. Her study followed 94 university students enrolled in four beginning-level Spanish classes. The treatment was administered during six class periods and was conducted during regular class time by the same teacher. The song group heard a commercially recorded song in

Spanish; the speech group heard the same song as recorded speech, and the remaining group was the control group. The text recall results showed that the music group scored higher than the speech and control groups for immediate recall. However, there was no significant difference in delayed recall. The study indicates that the use of songs in a FL classroom may aid in the memorization of text. Also, since the Din occurrence increased with music, music may be an efficient way to stimulate language acquisition.

While the previously mentioned studies examined the effects of music on memory, the research conducted by Brutton, Angelis, and Perkins (1985) tried to identify the variables that influence oral proficiency. The purpose of their study was to measure auditory and memory variables of ESL oral proficiency, to differentiate between language groups, and to identify a predictor variable of variance in proficiency among individual ESL speakers. Advanced adult ESL students took standardized tests of both music and English skills. The results showed that sentence repetition (memory) was the only predictor variable of ESL oral proficiency. Significant differences were found for different native language groups and for different tests. The authors proposed an investigation of the effects of music on ESL instruction. It was unclear whether music could enhance memory with sentence repetition. This area of research into the effects of music on memory is useful for demonstrating effective use of music as mnemonics for language teachers.

**Summary of studies and conclusions.** A wide variety of opinions are presented in this literature about music and language. While some of these studies do not directly investigate the role of music in learning vocabulary or grammar, they support the influence of music on memory in general. Even though many studies have reported that vocabulary recall or grammar can be learned through music, no studies showed that new vocabulary or grammar could be used

productively in speech and composition. Since the issue is complex and many variables are possible, some findings are conflicting. For example, according to Ayotte's research (2004), the use of songs in a FL classroom did not aid students' learning, while the use of songs in a FL classroom aided students' learning in Salcedo's (2002) study. Therefore, the studies indicate that more research is necessary before definitive statements can be made. Also, the literature review signifies that music is not so useful for improving production and communication skills, but works as a memory aid and motivates students to learn an L2. Music was not helpful for students to generalize their learning or their memories to new sentences or other occasions. However, some relevant initial observations can be made. The literature reviewed in this chapter indicates the following relationships between language and music:

1. Music affects the emotional state of students and can facilitate language learning.
2. Music and/or song lyrics present cultural learning in addition to language learning.
3. Popular songs make grammar study more meaningful to students.
4. Factors such as melody and rhythm positively affect short- and long-term memorization of language information.
5. Music helps students to improve prosody.

This literature review implies that music should improve skills in foreign/second language learning, either explicitly or implicitly. Additionally, music is an effective motivating tool. Many studies have examined L2 vocabulary acquisition. However, no previous research has directly or sufficiently addressed vocabulary for learners of Japanese as a FL. Therefore, there is a need to conduct the present research. The purpose of the present study is to identify the effects of singing on FL students' vocabulary retention in the university language classroom. Specifically, the dependent measure compares the experimental and control groups' number of

correct items on tests measuring immediate and delayed recognition. Chapter 3 will describe the research procedures used to answer the research questions.

## Chapter III

### Research Methods

This chapter describes the instruments, design, variables, participants, and procedures of the present study. It also provides similar information for a pilot study, conducted one year in advance of the present study, and includes the results from the pilot study. The researcher obtained HSCL approval for these studies (Appendix A) and the participants' informed consent (Appendix B).

**Instrument.** In both the present study and the pilot study, a recognition test was used to assess the participants' vocabulary retention. The researcher constructed a multiple-choice vocabulary test to examine their short- and long-term retention. The difficulty levels of these vocabulary tests were comparable for the pretest and two posttests measuring both immediate and delayed recognition (Appendix C). The first vocabulary posttest consisted of both the test and a questionnaire to obtain participants' demographic information. For the singing group, the posttest also included a section that asked questions about the participants' musical training/experience, questions that measured the effectiveness of sessions with singing, and a question about whether or not they had heard the song before. The second posttest only had the vocabulary test part for both groups.

***Selection of content for tests.*** Each of the three tests had a total of 16 items. Eight items (transitive/intransitive verb pairs) taken from the song were repeated on each test, and eight additional items (transitive/intransitive verb pairs) taken from a chapter in the textbook were intended to be comparable in their levels of difficulty. First, the researcher had classified every vocabulary word (transitive and intransitive verbs) in both the song and the textbook into a *familiar* category or a *new* category for the students. Second, she had classified the

transitive/intransitive verb pairs into four groups: the *familiar* to *familiar*, the *familiar* to *new*, the *new* to *familiar*, and the *new* to *new*. Third, in order to make the three tests comparable in their levels of difficulty, she had divided and placed the pairs into the three tests based on these criteria. Eight identical questions from the song were repeated on each test. Of the eight questions from the textbook on the second posttest, half of the items were from the pretest, and the other half were from the first posttest. These questions were identical.

After the questions had been created, the researcher constructed the three tests with random orders of questions, using a Table of Random Numbers to randomly place the three sets of the 16 questions among the three tests (pretest, first posttest, and second posttest).

***Definition of transitive verbs and intransitive verbs.*** Verbs can be divided into two types, transitive and intransitive. Transitive verbs take a direct object, but intransitive verbs do not (Tsujimura, 1996, p. 117). This means that transitive sentences describe an activity in which the operator changes the state of somebody or something else, while intransitive sentences describe an activity that involves the operator only (Jordan & Noda, 1988, p. 87) (see Examples 1 and 2). Because of these semantic relationships, transitive and intransitive verbs are often referred to as (lexical) causative and inchoative verbs, respectively. Passive and inchoative sentences are similar in meaning and syntax. However, passive sentences assume the presence of an individual causing a change, while inchoative sentences do not (Tsujimura, 1996, p. 145, 147) (see Examples 2 and 3).

In Japanese, transitive- and intransitive-forming suffixes are added immediately to the right of the identical verbal root. Transitive suffixes include *-as* and *-e*, and intransitive suffixes include *-ar* and *-e*. The transitive suffix *-as* resembles the causative suffixes *-sase* and *-se*, and

the intransitive suffix *-ar* resembles the passive suffixes *-rare* and *-re* (Shibatani, 1990, p. 236, 237).

#### Example 1

山田さんがドアを閉めた。 *Yamadasan ga doa o shimeta*: "Mr. Yamada closed the door."

#### Example 2

ドアが閉まった。 *Doa ga shimatta*: "The door closed" (Iori, Takanashi, Nakanishi, & Yamada, 2005, p. 96).

#### Example 3

ドアが閉められた。 *Doa ga shimerareta*: "The door was closed (by somebody)."

***Transitive/intransitive verb pairs.*** One of the important characteristics of Japanese verb morphology is an existence of many transitive/intransitive verb pairs (Iwasaki, 2002, p. 63). These pairs are related to each other morphologically, syntactically, and semantically (Tsujimura, 1996, p. 144). There are five main groups of transitive/intransitive verb pairs, in addition to the irregular pairs. In group 1, transitive verbs are consonant verbs, and intransitive verbs are /-e/ ending vowel verbs. In group 2, the situation reverses. In groups 3-5, transitive verbs contain a /-s/ in their roots. In group 3, intransitive verbs contain no marking. Finally, in groups 4 and 5, intransitive verbs contain a /-r/ in their roots (Iwasaki, 2002, p. 63, 64). Irregular pairs include *korosu*: "kill"/*sinu*: "die," and *otosu*: "drop"/*otiru*: "drop" (Shibatani, 1990, p. 235).

The closest analogy in English are pairs such as "raise"/"rise" and "lay"/"lie." However, in English, the majority of transitive/intransitive verb pairs take identical verb forms such as "open," "close," and "change" (Tsujimura, 1996, p. 144, 150). According to Takahashi (1967), the English concepts of "transitive" and "intransitive" do not correspond to the equivalent Japanese concepts of *tadoshi* and *jidoshi*. For instance, "to meet" in English is a transitive verb

because it grammatically requires a direct object. However, in Japanese, the verb *au* (to meet) is intransitive and thus is not preceded by the particle *o* (an accusative case marker). This can cause confusion for native English speakers who are attempting to learn Japanese. Because transitive/intransitive verb pairs are vocabulary words, L2 learners of Japanese need to memorize not only the items, but also an accurate structure, such as the use of a correct particle, whether or not a direct object is necessary, and the use of a correct subject-verb correspondence. “Native English speakers find it challenging to memorize the pairs because they are often unaware of the differences between transitive and intransitive verbs, partly because the same verbs can often be used in both transitive and intransitive constructions [in English]” (Makino, Hatasa, Y. A., & Hatasa, K., 2000, p. 253), whereas in Japanese, using the same verbs in both transitive and intransitive constructions is less common.

**The teaching material and its development.** The researcher used the song, *Servant Robot No.1* (Yoshida, 2006) (a copy of the song lyrics and its English translation appear in Appendix D), which was created as an instructional device, in order to make it into two shorter versions with Audacity 1.3 Beta in the language lab, due to the limited time of intervention. The introduction/beginning and postlude/ending of the song was removed for Version A (2 minutes 54 seconds). Only the chorus of the first and second verses was kept for the shorter version, which is called Version B (1 minute 9 seconds). The two song versions were copied onto a new CD for the singing group.

A speech CD was also created. A graduate teaching assistant (GTA) (a male native speaker of Japanese) and the researcher (a female native speaker of Japanese) spoke the lyrics into the microphone in the sound-proof recording booth in the language lab. The speech was also recorded with Audacity 1.3 Beta in the lab, in order to make the two versions comparable to

the song CD. Since a song has rest, rhythm, and accompaniment, the song CD lasts longer than the speech CD. Therefore, the corresponding spoken version (A') lasts 1 minute 16 seconds, and the other version (B') lasts 37 seconds. These two spoken versions were copied onto a new CD for the non-singing group. These CDs were made to time the lesson and keep the stimulus (song or speech) constant across the intervention for three days.

**Design.** A quasi-experimental design with convenience sampling was used for this study. A two-group pre- and posttest design was chosen for this research.

**Variables.** The independent variable (IV) for this study was condition: a singing group or non-singing control group. The dependent variable (DV) for this study was the mean scores of the experimental group and the control group on the posttests measuring both immediate and delayed recognition of the vocabulary.

**Data analysis.** An Analysis of Covariance (ANCOVA) revealed whether there was a statistically significant difference between the mean scores of the singing and control groups regarding their vocabulary retention (immediate and delayed recognition). ANCOVA was chosen because it retains statistical power despite the decreased posttest variance because of a ceiling effect (Cribbie & Jamieson, 2004). The researcher entered the data from the pretest and the posttests into a spreadsheet and into an SPSS file to perform an ANCOVA. An alpha level of  $p = .05$  was chosen for this report.

**Null hypotheses.** The null hypotheses, which were directly testable, stated that (1) there would be no difference between the mean scores of the experimental group and the control group on the posttest measuring immediate vocabulary recognition; and (2) there would be no difference between the mean scores of the experimental group and the control group on the posttest measuring delayed vocabulary recognition.

**Pilot study participants.** The participants were students ( $N = 33$ ) from two sections of a FL class, JPN 204 Intermediate Japanese I, at the University of Kansas. All were enrolled in the third semester of Japanese instruction. Of the 33 students in the two sections, all volunteered to participate in the experiment that was offered as part of class. The 15 participants from one section were assigned to the singing group, and the 18 participants from the other section were assigned to the control group. Of the 33 students who volunteered, 23 students completed all four phases of the study.

Of the 23 participants whose data were analyzed, 9 were in the singing group and 14 were in the non-singing group; 15 were male and 8 were female. The mean age of the participants was 20.74 years with a standard deviation of 2.94 years. The participants included 86.40% Americans (20 native English speakers) and 13.60% other nationalities (3 non-native English speakers). There were 90.90% ( $n = 21$ ) undergraduate students and 9.10% ( $n = 2$ ) graduate students. There were 39.10% ( $n = 9$ ) Japanese majors and 60.90% ( $n = 14$ ) non-Japanese majors. The mean Japanese language experience of the participants was 3.09 semesters with a standard deviation of 1.31 semesters. The mean length of a visit to Japan by the participants was .89 weeks with a standard deviation of 1.49 weeks. Eighty-six percent of the participants had never been to Japan. One student did not answer her nationality; one student did not answer his student status, and four students did not report their ages.

**Present study participants.** The participants were 30 students from two sections of a foreign language class, JPN 204 Intermediate Japanese I, at the University of Kansas. All were in their third semester of Japanese instruction. Of the 30 students in the two sections, all volunteered to participate in the experiment that was offered as part of class. Their participation did not influence their grade in the course, and they were told that they would not

be penalized if they chose not to participate. The 19 participants from one section were assigned to the experimental (singing) group and the 11 participants from the other section were assigned to the control group. Of the 30 students who volunteered, 26 students completed all four phases of the study (pretest, lessons, first posttest, and second posttest).

Of the 26 participants whose data were analyzed, 17 were in the singing group and 9 were in the non-singing group; 15 were male and 11 were female. The mean age of the participants was 21.23 years with a standard deviation of 2.57 years. All participants were Americans (native English speakers) and undergraduate students. There were 38.50% ( $n = 10$ ) Japanese majors and 61.50% ( $n = 16$ ) non-Japanese majors. The mean Japanese language experience of the participants was 3.85 semesters with a standard deviation of 1.89 semesters. The mean length of time the participants had visited Japan was 1.77 weeks with a standard deviation of 3.27 weeks. Fifty-eight percent ( $n = 15$ ) of the participants had never been to Japan.

**Pilot study procedures.** The regular professor of the course administered each consent form and pretest to the participants in two sections of the same class, five days before this researcher's lesson/intervention. Between the pretest and the researcher's lesson, the students were busy studying for the midterm exam, so it was less likely that the students learned or studied the target vocabulary (transitive/intransitive verbs). Thus, it is assumed that the pretest is trustworthy.

One section was assigned as the singing group and the other section as the control group. Within these sections, the researcher coded the research instrument (the pretest and posttests) with a number based on students' names listed alphabetically. The researcher then asked the participants to label their tests with their numbers on both the pre- and posttests as opposed to

labeling their tests with their names. This identification method was also used for both immediate and delayed recognition tests. To test immediate recognition, the students in both sections took a posttest on transitive and intransitive verbs at the end of the last lesson. To test delayed recognition, they took another posttest on the vocabulary retention 16 days after the instruction was completed. The second posttest was given as part of a chapter quiz; that is, it was given during the class along with other tests.

Within three consecutive class periods, the researcher taught the same eight pairs of 16 new words from the song lyrics to the students in the two sections of the Japanese FL class.

Table 1

*Eight Transitive – Intransitive Verb Pairs*

	Transitive verb	Intransitive verb	Gloss of transitive verb
1	あける	あく	to open
2	つける	つく	to turn on
3	やく	やける	to bake, burn
4	いれる	はいる	to put in
5	かえる	かわる	to change
6	なおす	なおる	to fix, cure
7	はじめる	はじまる	to begin
8	きめる	きまる	to decide

The singing group was taught these transitive and intransitive verb pairs in a song activity, while the control group was taught them without the song. Participants in the singing group listened to and sang the song, and then took a vocabulary test as an immediate recognition test at the end of the last lesson. This music activity lasted approximately 15 minutes for three consecutive class periods. Participants in the control group learned the same song lyrics without melody and took the same vocabulary test at the end of the last lesson. The lyrics were taught in a lecture style with recitation. The participants repeated the lyrics after the teacher spoke them.

On the first and third days, the students in both the experimental and the control groups received instruction about transitive and intransitive verbs from the regular graduate teaching assistant (GTA 1) of the course for 35 minutes during each of her 50-minute class periods, in conjunction with 15 minutes of the pilot study. The procedure for the second day was the same as the first day, except for two differences. First, the students in both groups were taught by two other GTAs (GTA 2 and GTA 3), instead of GTA 1. Second, the students in both groups received their instruction for 55 minutes during this 70-minute class period. This could have affected the students' performances on the posttests.

Between the first and second posttests, the regular professor, GTA 1, and GTA 2 reviewed the target vocabulary during their classroom activities a total of three times. Two out of the eight transitive/intransitive verb pairs (*akeru/aku*: "open" and *tukeru/tuku*: "turn on") were used in their activities. Again, this could have affected the students' performances on the second posttests. Overall, both groups were exposed to the same amount, method, and content of instruction by the professor or the three GTAs, so that the IV was the only measurable difference between the groups.

**Present study procedures.** The procedures of the present study were almost the same as procedures for the pilot study, except for the following:

A total of three instructors (the regular instructor of the course and two GTAs) were involved in the instruction of the target vocabulary, instead of four instructors (the regular professor of the course and three GTAs) in the pilot study.

Within the two sections of the same class, this researcher coded the pilot study research instrument (the pretest and posttests) with a number. The numbers are based on the names of each student listed alphabetically. The researcher then asked the participants to label their tests with their assigned number on both the pre- and posttests. For the present study, the research instrument was labeled with the student names. This was due to the limited amount of class time available.

For long-term retention, the participants took the second posttest 27 days after the instruction was completed, instead of 16 days in the pilot study. The test was given as part of a final exam during the class along with other tests, while for the pilot study, it was given during the chapter quiz. This longer time period was intentionally designed in the hopes of increasing the statistical significance of the results as well as to test effects over a longer duration.

The music activity lasted approximately 18 minutes for three consecutive class periods as compared to 15 minutes in the pilot study. Between the first and second posttests, the regular instructor and GTAs reviewed the target vocabulary during their classroom activities. Seven out of the eight transitive/intransitive verb pairs were reviewed (compared with just two during the pilot study). This change was also deliberate, as the researcher asked the instructor and GTAs not to emphasize any word, in order to avoid causing *noise* in the research design. As a matter of fact, instructors used all words in the textbook equally in their lessons, but they also

excluded the verb pairs that appear in the song from the chapter tests/quizzes, which were administered before the researcher's second posttest. Both of these changes were designed to increase the reliability of the results.

**Pilot study results.** The researcher analyzed the answers to the closed- and open-ended questions on the posttests for both immediate and delayed recognition by computing an ANCOVA to examine whether there was a statistically significant difference between the mean scores of the experimental group and the control group on the posttests. The ANCOVA revealed there was no statistically significant difference between the mean scores of the singing and control groups regarding their vocabulary retention.

**First posttest.** Research question (1): Do university level students of Japanese remember target vocabulary with immediate recognition better when it is introduced in the context of a song?

No statistically significant difference existed in the first posttest mean scores between the singing group and the non-singing group. The hypothesis that the singing group would have a higher first posttest mean score than the non-singing group was not supported.

A One-Way ANCOVA was conducted to evaluate differences between the groups in the posttest vocabulary scores. The IV included two levels: singing and non-singing. The DV was the students' first posttest mean scores, and the covariate was the mean pretest scores. A preliminary analysis evaluating the homogeneity-of-slopes assumption indicated that the relationship between the covariate and the DV did not differ significantly as a function of the IV,  $F(4, 9) = .77, p = .57$ . There was no significant difference between the experimental and control groups on the posttest vocabulary scores after accounting for the pretest differences,  $F(1, 20) = .004, p = .95$ . The strength of the relationship between the grouping factor and the DV

was very small, as assessed by partial  $\eta^2$ , with the grouping factor accounting for .00% of the variance of the DV, holding constant the mean pretest scores. The means of the students' first posttest scores that adjusted for initial differences were 6.51 for the singing group and 6.46 for the non-singing group. The means and standard deviations for the test scores are presented in Table 2. The results are presented in Table 3.

***Second posttest.*** Research question (2): Do university level students of Japanese remember target vocabulary with delayed recognition better when it is introduced in the context of a song?

No statistically significant difference existed in the second posttest mean scores between the singing group and non-singing group. The hypothesis that the singing group would have a higher second posttest mean score than the non-singing group was not supported.

A One-Way ANCOVA was conducted to evaluate differences between the groups in the posttest vocabulary scores. The IV included two levels: singing and non-singing. The DV was the students' mean second posttest scores, and the covariate was the mean pretest scores. A preliminary analysis evaluating the homogeneity-of-slopes assumption indicated that the relationship between the covariate and the DV did not differ significantly as a function of the IV for the second posttest,  $F(4, 9) = .57, p = .69$ . There was no significant difference between the experimental and control groups on the posttest vocabulary scores after accounting for the pretest differences,  $F(1, 20) = 4.14, p = .055$ . The strength of the relationship between the grouping factor and the DV was large, as assessed by partial  $\eta^2$ , with the grouping factor accounting for 17% of the variance of the DV, holding constant the mean pretest scores. The means of the students' second posttest scores that adjusted for initial differences were 7.27 for the singing group and 6.33 for the non-singing group. The means and standard deviations for the test

scores are presented in Table 2. The results are presented in Table 3. Figure 1 shows the means of three tests by group.

Table 2

*Means and Standard Deviations for Pre- and Post-Test Scores*

Condition	<i>M</i> Pre	<i>SD</i> Pre	<i>M</i> Post1	<i>SD</i> Post1	<i>M</i> Post2	<i>SD</i> Post2
Singing	2.89	2.42	6.44	1.59	7.22	.67
Non-singing	3.21	2.22	6.50	1.70	6.36	1.45

*N* = 23

Table 3

*Results of Analysis of Covariance for Two Post-Test Scores*

	Condition	Adj <i>M</i>	<i>F</i> (1, 20)	<i>p</i>	partial $\eta^2$
Post1	Singing	6.51	.004	.948	.00
	Non-singing	6.46			
Post2	Singing	7.27	4.137	.055	.17
	Non-singing	6.33			

**Demographic information.** Students' demographic information (experience of visiting Japan, academic majors) was taken into consideration to analyze the test results by computing descriptive statistics, correlations coefficients, and an ANCOVA. The descriptive statistics for the students' demographic information are presented in Table 4.

Table 4

*Students' Demographic Information*

Condition	<i>M</i> Japan visit (weeks)	<i>SD</i> Japan visit (weeks)	% of Japanese major
Singing ( <i>n</i> = 9)	.61	1.05	33
Non-singing ( <i>n</i> = 14)	1.07	1.73	43

Pearson product-moment correlation coefficients among the four scales (students' visits to Japan, pretest scores, first posttest scores, and second posttest scores) were computed. The results showed that there was a statistically significant correlation between students' visits to Japan and the pretest,  $r(21) = .42, p < .05$ . Students who stayed longer in Japan did better on the pretest than those who did not. There were no statistically significant correlations between students' visits to Japan and the two posttests: the first posttest,  $r(21) = .26, p = .24$ , and the second posttest,  $r(21) = .26, p = .23$ . The results of the correlational analyses are presented in Table 5.

A One-Way ANCOVA was conducted to evaluate differences in adjusted means. The IV included two levels: singing and non-singing. The DV was students' mean posttest scores, and the covariates were the mean pretest scores and students' visits to Japan. The ANCOVA was significant for the second posttest,  $F(1, 19) = 4.41, p < .05$ . The strength of the relationship between the grouping factor and the DV was large, as assessed by partial  $\eta^2$ , with the grouping factor accounting for 19% of the variance of the DV, holding constant the mean pretest scores and students' visits to Japan. The means of the students' second posttest scores that adjusted for initial differences were ordered across the two levels of the IV. The singing group had a

larger adjusted mean ( $M = 7.30$ ) than the non-singing group ( $M = 6.31$ ). The ANCOVA was not significant for the first posttest,  $F(1, 19) = .02, p = .90$ . The results are presented in Table 6.

Likewise, Pearson product-moment correlation coefficients among students' academic majors and the three test scores (pretest, first posttest, and second posttest) were computed. The results showed that there was a statistically significant correlation between students' academic majors and the pretest,  $r(21) = -.41, p < .05$ . Students majoring in Japanese did better on the pretest than those who were not. The control group had an advantage,  $r(21) = -.65, p < .05$ , but the experimental group did not,  $r(21) = -.03, p = .93$ . There were no correlations between students' academic majors and the two posttests: the first posttest,  $r(21) = .26, p = .22$ , and the second posttest,  $r(21) = .27, p = .21$ . The results of the correlational analyses are presented in Table 5.

Table 5

*Correlations of Students' Demographic Information with Pre- and Post-Test Scores*

Demographic	Pre	Post1	Post2
Japan visit	.42*	.26	.26
Japanese major	-.41*	-.26	-.27

\* $p < .05$

A Two-Way (2x2) ANCOVA was conducted to evaluate differences in adjusted means. The IV 1 (condition) included two levels: singing and non-singing. The IV 2 (students' academic majors) included two levels: Japanese majors and non-Japanese majors. The DV was students' mean posttest scores, and the covariate was the mean pretest scores. The ANCOVA indicated no significant interaction between the IV 1 (condition) and the IV 2 (students'

academic majors) for the first posttest,  $F(1, 18) = .01, p = .94$ , partial  $\eta^2 = .00$ , a small value.

No significant differences were found for the main effects of either the IV 1 (condition) or the IV 2 (students' academic majors). Also, no significant interaction existed at the .05 level of significance for the second posttest,  $F(1, 18) = 1.61, p = .22$ , partial  $\eta^2 = .08$ , a medium value.

No significant differences were found for the main effects of either the IV 1 (condition) or the IV 2 (students' academic majors). The means of the students' second posttest scores that adjusted for initial differences were 7.02 for the Japanese majors in the singing group and 6.86 for the Japanese majors in the non-singing group. The adjusted mean of the non-Japanese majors in the singing group was 7.38 and that of the non-Japanese majors in the non-singing group was 5.94. The results are presented in Table 6.

Table 6

*Results of Analysis of Covariance for Two Post-Test Scores, Considering Students' Demographic Information*

Demographic	Test	Condition	Adj <i>M</i>	<i>df</i>	<i>F</i>	<i>p</i>	partial $\eta^2$
Japan visit	Post1	Singing	6.53	1, 19	.016	.901	.00
		Non-singing	6.45				
	Post2	Singing	7.30	1, 19	4.411	.049*	.19
		Non-singing	6.31				
Japanese major	Post1	Singing	6.69	1, 18	.006	.939	.00
		Non-singing	6.70				
	Post2	Singing	7.02	1, 18	1.610	.221	.08
		Non-singing	6.86				
Non-Japanese major	Post1	Singing	6.40	1, 18	.006	.939	.00
		Non-singing	6.29				
	Post2	Singing	7.38	1, 18	1.610	.221	.08
		Non-singing	5.94				

\* $p < .05$

**Three types of items on the tests.** The test items from the song were classified into three types for the purpose of data analysis: Type 1 (items that also appear in the textbook and were emphasized by the instructor), Type 2 (items that also appear in the textbook but were not emphasized by the instructor), and Type 3 (an item that only appears in the song).

A One-Way Multivariate Analysis of Variance (MANOVA) was conducted to determine the effect of the condition (singing and non-singing group) on the three dependent variables: Type 1, Type 2, and Type 3 test items. No significant difference was found between the two groups on the dependent measures for the pretest, Wilks'  $\Lambda = .99$ ,  $F(3, 19) = .07$ ,  $p = .98$ , multivariate  $\eta^2 = .01$ . This verified that the two groups were the same with respect to their knowledge on transitive and intransitive verbs prior to the intervention. No significant difference was found between the two groups on the dependent measures for the first posttest, Wilks'  $\Lambda = .83$ ,  $F(3, 19) = 1.32$ ,  $p = .30$ , multivariate  $\eta^2 = .17$ . No significant difference was found between the two groups on the dependent measures for the second posttest, Wilks'  $\Lambda = .81$ ,  $F(3, 19) = 1.48$ ,  $p = .25$ , multivariate  $\eta^2 = .19$ . Therefore, the groups did not differ from each other on any of the three types of test items on the three tests. Table 7 contains the means and standard deviations on the dependent variables for the two groups.

Table 7

*Means and Standard Deviations for Three Types of Test Items for Pre- and Post-Tests*

Test	Condition	<i>M</i> Type1	<i>SD</i> Type1	<i>M</i> Type2	<i>SD</i> Type2	<i>M</i> Type3	<i>SD</i> Type3
Pre	Singing	.42	.45	.33	.29	.22	.44
	Non-singing	.48	.35	.33	.37	.29	.47
Post1	Singing	.86	.22	.70	.31	.89	.33
	Non-singing	.93	.15	.71	.29	.64	.50
Post2	Singing	.97	.08	.78	.17	1.00	.00
	Non-singing	.95	.14	.60	.40	.79	.43

**Questionnaire.** The singing group filled out the questionnaire, in addition to taking the posttests. (A copy of the questionnaire appears in Appendix C.) The questionnaire was intended to obtain the students' perceptions about the effectiveness of sessions with singing. All participants in the singing group reported that they had never heard the song before the instruction (Question 4).

Questions 5 and 6 asked the participants about their musical training. Of the 9 participants, 4 had previous musical training and 5 had not. Two of the 4 took private lessons, and 3 of the 4 participated in school or church choir or band/orchestra.

Question 7 asked the participants how much music helped them to learn the Japanese language in the lessons. The participants answered using a 5-point Likert scale (1 = *not at all* to 5 = *a lot*). The mean was 2.89 with a standard deviation of .93. Approximately 89% of the singing group (8 out of 9 participants) reported that music helped them to learn the Japanese language, and approximately 11% (1 out of 9 participants) reported that music did not help.

For the 8 participants who answered that music was helpful, Question 8 analyzed which aspect of music (melody, rhythm, and/or tempo) helped them to learn. Students could select all aspects that applied. Approximately 44% of the 8 participants reported that the melody of the song was helpful, approximately 67% reported that rhythm was helpful, and approximately 11% reported that tempo was helpful. Question 9 analyzed which aspect of language (vocabulary, grammar, pronunciation, and/or knowledge of Japanese culture) was improved by the use of the song in the lessons. Again, students were encouraged to report all aspects that applied. Approximately 89% of the 8 participants reported that their vocabulary was improved by the use of the song, approximately 44% reported that their grammar and pronunciation were improved, and approximately 11% reported that their knowledge of Japanese culture was improved.

Questions 11-13 analyzed the actual use of music (melody, rhythm, and/or tempo) to recall/recognize the target vocabulary when the participants took the first posttest.

Approximately 89% of the singing group reported that they used melody and rhythm, and approximately 56% of them used tempo.

Question 14 asked the participants to indicate how much they experienced the Din after the lesson. The participants answered using a 5-point Likert scale (1 = *not at all* to 5 = *a lot*). The mean was 3.89 with a standard deviation of 1.27. All students in the singing group reported that the words from the song played back in their heads. Approximately 44% of the singing group reported that the words played back a lot, approximately 22% reported that the words played back either often or little, and approximately 11% reported that the words played back in their heads sometimes.

Open-ended Question 10 asked about the students' personal attitudes toward the language lessons using music. Approximately 89% of the singing group (8 out of the 9 participants) reported that they liked the language lessons with music. The comments written on the questionnaire further clarified their impressions and perceptions of lessons with music. The following are some representative quotations from the singing group's comments: "The music is catchy and stays in my head," "It's a fun change to learn from music; it complements lectures and helps with pronunciation and fluency," "The music helps me to memorize things more quickly," and "It was fun to play the song, and it actually helped to differentiate between transitive and intransitive from the examples in the song."

***Establishing test validity and reliability.*** Prior to the test, one instructor authenticated its validity for the vocabulary test instruments. Factor analysis was not used to validate the

inclusion of a set of indicator variables in the scale for a construct because of the small number of the participants.

Pearson product-moment correlation coefficients between test items were computed for the three scales (pretest, first posttest, and second posttest). The average correlation between items on the pretest was .24 with a standard deviation of .22. The minimum was -.163 and the maximum was .703. The average correlation between items on the first posttest was .18 with a standard deviation of .20. The minimum was -.183 and the maximum was .519. The average correlation between items on the second posttest was .15 with a standard deviation of .33. The minimum was -.247 and the maximum was 1.000. (Correlation matrices for the three tests appear in Appendix F.)

Cronbach's alpha was used to establish internal consistency for the tests. The average Cronbach's alpha of the three scales was .60. The pretest value was .72; the first posttest value was .63, and the second posttest value was .46.

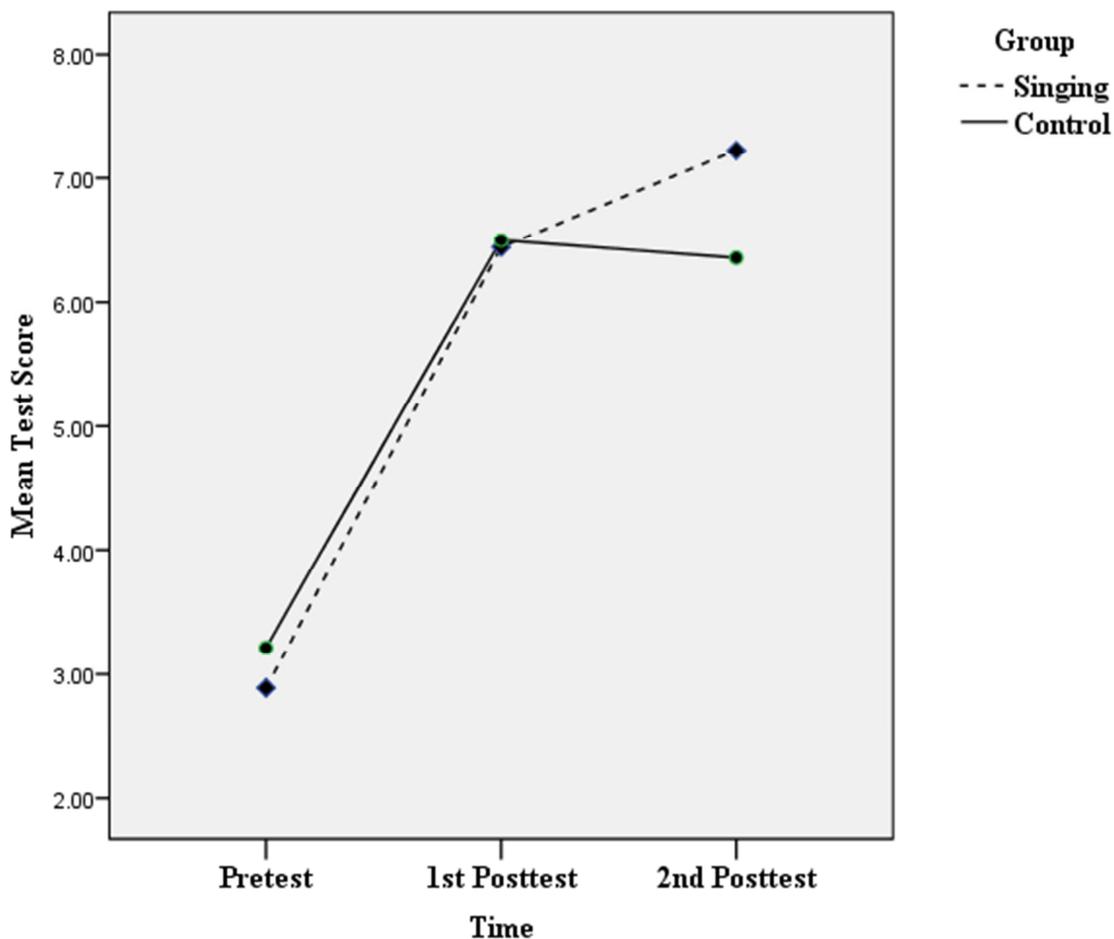
Using Pearson product-moment correlation coefficients, the participants' test-retest reliability was examined. The results showed no statistically significant correlation between the pretest and the first posttest for the singing group,  $r(7) = .14, p = .71$ , but there was a statistically significant correlation between the pretest and the first posttest for the non-singing group,  $r(12) = .60, p < .05$ . There was a statistically significant correlation between the pretest and the second posttest for the singing group,  $r(7) = .71, p < .05$ , and no statistically significant correlation between the pretest and the second posttest for the non-singing group,  $r(12) = .45, p = .10$ . There was no statistically significant correlation between the first posttest and the second posttest for the singing group,  $r(7) = -.46, p = .21$ , and no statistically significant correlation between the first posttest and the second posttest for the non-singing group,  $r(12) = .52, p = .06$ .

For both groups, the amount of time between the pretest and the first posttest was seven days, between the pretest and the second posttest was 23 days, and between the first posttest and the second posttest was 16 days. Since the three tests correlated at .14 (the pretest and the first posttest), .71 (the pretest and the second posttest), and -.46 (the first posttest and the second posttest) respectively, the average reliability for the singing group was .13. Since the three tests correlated at .60 (the pretest and the first posttest), .45 (the pretest and the second posttest), and .52 (the first posttest and the second posttest) respectively, the average reliability for the non-singing group was .52.

The students participated in this research during their regular class time, and their test scores did not affect their course grades, so the study had high ecological validity. The researcher met the students in both groups for the same duration of time, so there was equal researcher effect on both groups.

Figure 1

*Means of Three Tests by Group*



***Pilot study conclusion.*** The pilot study suggested that singing and recitation had a similar effect on vocabulary acquisition (see also Mori, 2010). The hypothesis that the singing group would have higher test scores than the non-singing control group was not supported, except when statistically adjusting for a preexisting difference in the participants' visits to Japan. Since a significant group difference was found in the second posttest, it signifies that music might be more effective for long-term retention rather than short-term retention. A decision

was made for the present study to lengthen the amount of time between the two posttests since the pilot study results were trending towards significance for the second posttest.

**Changes from the pilot study to the present study.** As previously mentioned, for long-term vocabulary retention, the second posttest in the present study was administered 27 days after the instruction was completed, instead of 16 days, in order to have more time between the first and second posttests. To improve/heighten the reliability of the instrument, the regular instructor of the course administered all three tests at the same point in time during the class period (at the end of the class) and gave participants the same amount of time (5 minutes) to take the test each time. Also, the researcher asked the instructor and GTAs not to emphasize any word, in order to avoid causing *noise* in the research design. As a matter of fact, they not only used all words in the textbook equally in their lessons, but they also excluded the verb pairs that appear in the song from the chapter tests/quizzes, which were administered before the researcher's second posttest. In order to alleviate the Hawthorn effect potentially caused by language lessons with music, the students sang one Japanese popular song to learn another grammar point in a preceding chapter before the researcher's intervention.

In order to improve the quality of distracters on the test, some of the distracters that no student had chosen in the pilot study were replaced, as the fact they had not been chosen indicated they did not work well as distracters. Also, one question was added to the second posttest for the singing group to inquire if the participants in that group heard the song outside class between the first and second posttests. If there was a participant who reported that he/she heard the song between the first and second posttests, his/her data would not be used for data analyses.

**Chapter summary.** This chapter described the pilot study and the present study's instruments, design, variables, participants, and procedures. It also presented results from the pilot study and discussed changes made to the procedure of the present study based on those results. While Chapter 3 described the methodology of the present research and its pilot study, Chapter 4 will present the results of the present study for the research questions.

## Chapter IV

### Results

This chapter presents and summarizes results from the present study, which was conducted according to the procedures outlined in Chapter 3. The study examined the effects of the singing method on the short- and long-term vocabulary retention of university students in a FL course. The data were analyzed to see if there was a significant difference between the singing group's and non-singing group's content learning, which was reflected in their mean posttest scores.

The study answered the following research questions: (1) Do university level students of Japanese remember target vocabulary with immediate recognition better when it is introduced in the context of a song? (2) Do university level students of Japanese remember target vocabulary with delayed recognition better when it is introduced in the context of a song?

As in the pilot study, the researcher analyzed the answers to the closed- and open-ended questions on the posttests for both immediate and delayed recognition by computing an ANCOVA to examine whether there was a statistically significant difference between the mean scores of the experimental group and the control group on the posttests. The researcher entered the data from the pretest and the posttests into a spreadsheet and into an SPSS file to perform an ANCOVA. An alpha level of  $p = .05$  was chosen for this report. The ANCOVA revealed similar results to those in the pilot study: there was a statistically significant difference between the mean scores of the singing and control groups regarding their long-term recognition, but no statistically significant difference between the groups regarding their short-term recognition.

**First posttest.** Research question (1): Do university level students of Japanese remember target vocabulary with immediate recognition better when it is introduced in the context of a song?

No statistically significant difference existed in the first posttest mean scores between the singing group and the non-singing group. The hypothesis that the singing group would have a higher first posttest mean score than the non-singing group was not supported.

A One-Way ANCOVA was conducted to evaluate differences between the groups in the posttest vocabulary scores. The IV included two levels: singing and non-singing. The DV was the students' first posttest mean scores, and the covariate was the mean pretest scores. A preliminary analysis evaluating the homogeneity-of-slopes assumption indicated that the relationship between the covariate and the DV did not differ significantly as a function of the IV,  $F(6, 11) = 2.32, p = .11$ . There was no significant difference between the experimental and control groups on the posttest vocabulary scores after accounting for the pretest differences,  $F(1, 23) = 2.12, p = .16$ . The strength of the relationship between the grouping factor and the DV was medium, as assessed by partial  $\eta^2$ , with the grouping factor accounting for 8.40% of the variance of the DV, holding constant the mean pretest scores. The means of the students' first posttest scores that adjusted for initial differences were 6.23 for the singing group and 5.24 for the non-singing group. The means and standard deviations for the test scores are presented in Table 8. The results are presented in Table 9.

**Second posttest.** Research question (2): Do university level students of Japanese remember target vocabulary with delayed recognition better when it is introduced in the context of a song?

A statistically significant difference existed in the second posttest mean scores between the singing group and non-singing group. The hypothesis that the singing group would have a higher second posttest mean score than the non-singing group was supported.

A One-Way ANCOVA was conducted to evaluate differences between the groups in the posttest vocabulary scores. The IV included two levels: singing and non-singing. The DV was the students' mean second posttest scores, and the covariate was the mean pretest scores. A preliminary analysis evaluating the homogeneity-of-slopes assumption indicated that the relationship between the covariate and the DV did not differ significantly as a function of the IV for the second posttest,  $F(6, 11) = 1.73, p = .20$ . There was a significant difference between the experimental and control groups on the posttest vocabulary scores after accounting for the pretest differences,  $F(1, 23) = 7.79, p \leq .01$ . The strength of the relationship between the grouping factor and the DV was large, as assessed by partial  $\eta^2$ , with the grouping factor accounting for 25% of the variance of the DV, holding constant the mean pretest scores. The means of the students' second posttest scores that adjusted for initial differences were ordered across the two levels of the IV. The singing group had a larger adjusted mean ( $M = 7.05$ ) than the non-singing group ( $M = 5.80$ ). The means and standard deviations for the test scores are presented in Table 8. The students scored high regardless of the condition (see table 8). The students in both groups scored 75.75% (singing) and 69.50% (non-singing) correct on the first posttest, as well as 87.50% (singing) and 73.63% (non-singing) correct on the second posttest, respectively. Based on the observation of the raw data, most students scored 7 or 8, where 8 is a full score, on both/either an immediate (first posttest) and/or a delayed (second posttest) recognition tests. The lowest score was 5 on the delayed test. The ANCOVA results are presented in Table 9. Figure 2 shows the means of the three tests by group.

Table 8

*Means and Standard Deviations for Pre- and Post-Test Scores*

Condition	<i>M</i> Pre	<i>SD</i> Pre	<i>M</i> Post1	<i>SD</i> Post1	<i>M</i> Post2	<i>SD</i> Post2
Singing	2.59	2.27	6.06	1.56	7.00	.87
Non-singing	4.22	2.17	5.56	1.81	5.89	1.27

*N* = 26

Table 9

*Results of Analysis of Covariance for Two Post-Test Scores*

	Condition	Adj <i>M</i>	<i>F</i> (1, 23)	<i>p</i>	partial $\eta^2$
Post1	Singing	6.23	2.121	.159	.08
	Non-singing	5.24			
Post2	Singing	7.05	7.792	.010**	.25
	Non-singing	5.80			

\*\**p* ≤ .01

**Demographic information.** Students' demographic information (experience of visiting Japan, academic majors) was taken into consideration to analyze the test results by computing descriptive statistics, correlations coefficients, and an ANCOVA. The descriptive statistics for the students' demographic information are presented in Table 10.

Table 10

*Students' Demographic Information*

Condition	<i>M</i> Japan visit (week)	<i>SD</i> Japan visit (week)	% of Japanese major
Singing ( <i>n</i> = 17)	6.06	1.56	35
Non-singing ( <i>n</i> = 9)	5.56	1.81	44

Pearson product-moment correlation coefficients among the four scales (students' visits to Japan, pretest scores, first posttest scores, and second posttest scores) were computed. The results showed that there were no statistically significant correlations between students' visits to Japan and the three tests: the pretest,  $r(24) = .34, p = .09$ , the first posttest,  $r(24) = .22, p = .28$ , and the second posttest,  $r(24) = .07, p = .73$ . Students who stayed longer in Japan performed the same on the three tests as those who did not. Neither the experimental group (singing group) nor the control group (non-singing group) had an advantage on the three tests, in terms of the participants' experiences of visiting Japan. The results of the correlational analyses are presented in Table 11.

A One-Way ANCOVA was conducted to evaluate differences in adjusted means. The IV included two levels: singing and non-singing. The DV was students' mean posttest scores, and the covariates were the mean pretest scores and students' visits to Japan. The ANCOVA was significant for the second posttest,  $F(1, 22) = 7.34, p < .05$ . The strength of the relationship between the grouping factor and the DV was large, as assessed by partial  $\eta^2$ , with the grouping factor accounting for 25% of the variance of the DV, holding constant the mean pretest scores and students' visits to Japan. The means of the students' second posttest scores that adjusted

for initial differences were ordered across the two levels of the IV. The singing group had a larger adjusted mean ( $M = 7.05$ ) than the non-singing group ( $M = 5.80$ ). The ANCOVA was not significant for the first posttest,  $F(1, 22) = 1.94, p = .18$ . The results are presented in Table 12.

Likewise, Pearson product-moment correlation coefficients among students' academic majors and the three test scores (pretest, first posttest, and second posttest) were computed. The results showed that there were no statistically significant correlations between students' academic majors and the three tests: the pretest,  $r(24) = .09, p = .67$ , the first posttest,  $r(24) = -.11, p = .61$ , and the second posttest,  $r(24) = -.27, p = .18$ . Students majoring in Japanese performed the same on the pretest as those who were not. Neither the experimental group (singing group) nor the control group (non-singing group) had an advantage on the three tests, in terms of the participants' majors. The results of the correlational analyses are presented in Table 11.

Table 11

*Correlations of Students' Demographic Information with Pre- and Post-Test Scores*

Demographic	Pre	Post1	Post2
Japan visit	.34	.22	.07
Japanese major	.09	-.11	-.27

A Two-Way (2x2) ANCOVA was conducted to evaluate differences in adjusted means. The IV 1 (condition) included two levels: singing and non-singing. The IV 2 (students' academic majors) included two levels: Japanese majors and non-Japanese majors. The DV was

students' mean posttest scores, and the covariate was the mean pretest scores. The ANCOVA indicated no significant interaction between the IV 1 (condition) and the IV 2 (students' academic majors) for the first posttest,  $F(1, 21) = .23, p = .63$ , partial  $\eta^2 = .01$ , a small value. No significant differences were found for the main effects of either the IV 1 (condition) or the IV 2 (students' academic majors). Also, no significant interaction existed at the .05 level of significance for the second posttest,  $F(1, 21) = 3.02, p = .10$ , partial  $\eta^2 = .13$ , a medium value. However, significant differences were found for the main effects of both the IV 1 (condition),  $F(1, 21) = 9.29, p < .01$ , partial  $\eta^2 = .31$ , a large value, and the IV 2 (students' academic majors),  $F(1, 21) = 6.26, p < .05$ , partial  $\eta^2 = .23$ , a large value. The significant main effect of the condition indicated that the singing group ( $M = 7.00, SD = .87$ ) scored significantly higher in the second posttest than the control group ( $M = 5.89, SD = 1.27$ ). The significant main effect of the academic major indicated that the Japanese majors ( $M = 7.00, SD = .82$ ) scored significantly higher in the second posttest than the non-Japanese majors ( $M = 6.38, SD = 1.26$ ). The means of the students' second posttest scores that adjusted for initial differences were 7.26 for the Japanese majors in the singing group and 6.68 for the Japanese majors in the non-singing group. The adjusted mean of the non-Japanese majors in the singing group was 6.96 and that of the non-Japanese majors in the non-singing group was 5.03. The results are presented in Table 12.

Table 12

*Results of Analysis of Covariance for Two Post-Test Scores, Considering Students' Demographic Information*

Demographic	Test	Condition	Adj <i>M</i>	<i>df</i>	<i>F</i>	<i>P</i>	partial $\eta^2$
Japan visit	Post1	Singing	6.22	1, 22	1.939	.178	.08
		Non-singing	5.26				
	Post2	Singing	7.05	1, 22	7.342	.013*	.25
		Non-singing	5.80				
Japanese major	Post1	Singing	6.75	1, 21	.233	.634	.01
		Non-singing	5.32				
	Post2	Singing	7.26	1, 21	3.021	.097	.13
		Non-singing	6.68				
Non-Japanese major	Post1	Singing	5.95	1, 21	.233	.634	.01
		Non-singing	5.16				
	Post2	Singing	6.96	1, 21	3.021	.097	.13
		Non-singing	5.03				

\* $p < .05$

***Two types of items on the tests.*** The test items from the song were classified into two types for the purpose of data analysis: Type 1 (items that also appear in the textbook and were also taught by the regular instructor/GTAs) and Type 2 (an item that only appears in the song).

A One-Way Multivariate Analysis of Variance (MANOVA) was conducted to determine the effect of the condition (singing and non-singing group) on the two dependent variables: Type 1 and Type 2 test items. No significant difference was found between the two groups on the dependent measures for the pretest, Wilks'  $\Lambda = .86$ ,  $F(2, 23) = 1.91$ ,  $p = .17$ , multivariate  $\eta^2 = .14$ . This verified that the two groups were the same with respect to their knowledge on transitive and intransitive verbs prior to the intervention. No significant difference was found between the two groups on the dependent measures for the first posttest, Wilks'  $\Lambda = .98$ ,  $F(2, 23) = .26$ ,  $p = .77$ , multivariate  $\eta^2 = .02$ . A significant difference was found between the two groups on the dependent measures for the second posttest, Wilks'  $\Lambda = .77$ ,  $F(2, 23) = 3.46$ ,  $p < .05$ , multivariate  $\eta^2 = .23$ . Analyses of variances (ANOVA) on each dependent variable were conducted as follow-up tests to the MANOVA. Using a Holm's Sequential Bonferroni procedure, each ANOVA was tested at the .025 level. A significant difference was found between the two groups on Type 1 test items,  $F(1, 24) = 6.93$ ,  $p < .025$ . The strength of relationship between the group and Type 1 items, as assessed by  $\eta^2$  was strong, with the group variable accounting for 22 percent of the variance of the dependent variable. No significant difference was found between the groups on the Type 2 test item,  $F(1, 24) = .00$ ,  $p = .96$ ,  $\eta^2 = .00$ . A follow-up pairwise comparison to the ANOVA for Type 1 test items was not conducted since the group variable has two levels. Therefore, the singing group scored statistically significantly higher on the items that also appear in the textbook than the non-singing group in the second posttest, but both groups did not differ from each other on the item that only appears in the song on the three tests. Table 13 contains the means and standard deviations on the dependent variables for the two groups.

Table 13

*Means and Standard Deviations for Two Types of Test Items for Pre- and Post-Tests*

Test	Condition	<i>M</i> Type1	<i>SD</i> Type1	<i>M</i> Type2	<i>SD</i> Type2
Pre	Singing	.33	.27	.29	.47
	Non-singing	.54	.23	.56	.53
Post1	Singing	.75	.21	.76	.44
	Non-singing	.68	.25	.78	.44
Post2	Singing	.87	.10	.88	.33
	Non-singing	.73	.18	.89	.33

**Questionnaire.** The singing group filled out the same questionnaire as in the pilot study, in addition to taking the posttests. (A copy of the questionnaire appears in Appendix C.) All participants in the singing group reported that they had never heard the song before the instruction (Question 4), and did not hear the song outside class between the first and second posttests (Question 1 in the questionnaire part of the second posttest).

Questions 5 and 6 asked the participants about their musical training. Of the 17 participants, 11 had had musical training and 6 had not. Six of the 11 took private lessons, 7 of the 11 joined school choir or band/orchestra, 4 of the 11 joined community choir or band/orchestra, 4 of the 11 were self-taught, and 1 of the 11 had other types of musical training.

Question 7 asked the participants how much music helped them to learn the Japanese language in the lessons. The participants answered using a 5-point Likert scale (1 = *not at all* and 5 = *a lot*). The mean was 3.65 with a standard deviation of 1.12. Approximately 94% of

the singing group (16 out of 17 participants) reported that music helped them to learn the Japanese language, and approximately 6% (1 out of 17 participants) reported that music did not help him.

For the 16 participants who answered that music was helpful, Question 8 analyzed which aspect of music (melody, rhythm, and/or tempo) helped them to learn. Participants were encouraged to select all aspects that applied. Approximately 77% of the 16 participants reported that the melody and the rhythm of the song were helpful, and approximately 35% reported that tempo was helpful. Question 9 analyzed which aspect of language (vocabulary, grammar, pronunciation, and/or culture) was improved by the use of the song in the lessons. Again, participants were asked to choose all applicable answers. Approximately 82% of the 16 participants reported that their vocabulary was improved by the use of the song, approximately 71% reported that grammar was improved, approximately 59% reported that pronunciation was improved, and approximately 12% reported that culture was improved.

Questions 11-13 analyzed the actual use of music (melody, rhythm, and/or tempo) to recall/recognize the target vocabulary when the participants took the first posttest. Approximately 100% of the singing group reported that they used melody and rhythm, and approximately 88% of them used tempo.

Question 14 asked the participants to indicate how much they experienced the Din after the lesson. The participants answered using a 5-point Likert scale (1 = *not at all* and 5 = *a lot*). The mean was 4.24 with a standard deviation of .83. All students in the singing group reported that the words from the song played back in their heads. Approximately 47% of the singing group reported that the words played back a lot; approximately 29% reported that the words

played back often, and approximately 24% reported that the words played back in their heads sometimes.

Open-ended Question 10 asked about the students' personal attitude toward the language lessons using music. All students in the singing group (17 participants) reported that they liked the language lessons with music. To summarize the findings of Question 10, they reported that they enjoyed the language instruction with music. The comments written on the questionnaire further clarified their impressions and perceptions of lessons with music. The following are some representative quotations from the singing group's comments: "The language lessons with music made learning the transitive and intransitive pairs in the song easy," "The language lesson with music helps expand language comprehension," "Memorizing something to a tune is far easier than doing so without a tune," "I can hear the lyrics in my mind when I try to think of a specific transitive or intransitive verb," and "It's a nice break from the textbook and it's fun to sing with the class; it provides a fun way to learn using the grammar point."

***Establishing test validity and reliability.*** Several instructors authenticated the validity of the vocabulary test instruments. Four faculty members in Japanese literature and language teaching from two universities (Northwestern University and the University of Kansas) sampled, evaluated, and made suggestions about the content validity of the test. The researcher provided the evaluators with an evaluation sheet to record their feedback. The results showed that the mean validity for Part One (choosing intransitive counterparts for transitive verbs) was 4.25 on a scale of 1 (*low validity*) through 5 (*high validity*) with a standard deviation of .50 and that for Part Two (choosing transitive counterparts for intransitive verbs) was 4.25 with a standard deviation of .50 respectively. Factor analysis was not used to validate the inclusion of a set of indicator variables in the scale for a construct because of the small number of the participants.

Pearson product-moment correlation coefficients between test items were computed for the three scales (pretest, first posttest, and second posttest). The average correlation between items on the pretest was .33 with a standard deviation of .19. The minimum was -.053 and the maximum was .693. The average correlation between items on the first posttest was .18 with a standard deviation of .22. The minimum was -.332 and the maximum was .496. The average correlation between items on the second posttest was .13 with a standard deviation of .33. The minimum was -.275 and the maximum was 1.000. (Correlation matrices for the three tests appear in Appendix F.)

Cronbach's alpha was used to establish internal consistency for the tests. The average Cronbach's alpha of the three scales was .57. The pretest value was .80; the first posttest value was .51; and the second posttest value was .41.

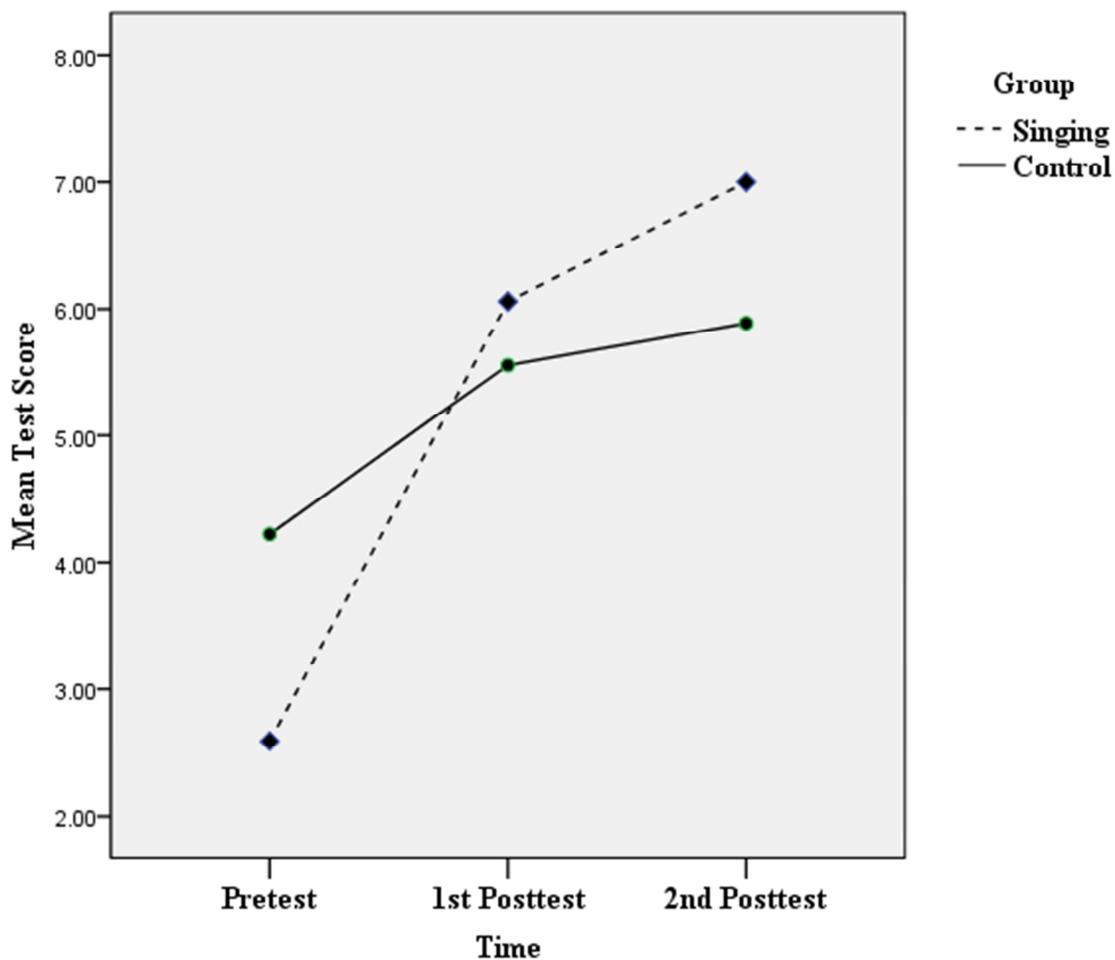
Using Pearson product-moment correlation coefficients, the participants' test-retest reliability was examined. The results showed a statistically significant correlation between the pretest and the first posttest for the singing group,  $r(15) = .61, p \leq .01$ , but there was no statistically significant correlation between the pretest and the first posttest for the non-singing group,  $r(7) = .03, p = .94$ . There was a statistically significant correlation between the pretest and the second posttest for the singing group,  $r(15) = .54, p < .05$ , and no statistically significant correlation between the pretest and the second posttest for the non-singing group,  $r(7) = -.31, p = .42$ . There was no statistically significant correlation between the first posttest and the second posttest for the singing group,  $r(15) = .46, p = .06$ , and no statistically significant correlation between the first posttest and the second posttest for the non-singing group,  $r(7) = -.13, p = .73$ . For both groups, the amount of time between the pretest and the first posttest was seven days, between the pretest and the second posttest was 34 days, and between the first posttest and the

second posttest was 27 days. Since the three tests correlated at .61 (the pretest and the first posttest), .54 (the pretest and the second posttest), and .46 (the first posttest and the second posttest) respectively, the average reliability for the singing group was .54. Since the three tests correlated at .03 (the pretest and the first posttest), -.31 (the pretest and the second posttest), and -.13 (the first posttest and the second posttest) respectively, the average reliability for the non-singing group was .16 (negative relationship).

The students participated in this research during their regular class time, and their test scores did not affect their course grades, so the study had high ecological validity. The researcher met the students in both groups for the same duration of time, so there was equal researcher effect on both groups.

Figure 2

*Means of Three Tests by Group*



***Present study conclusion.*** The hypothesis that the singing group would have higher test scores than the non-singing control group was not supported for the first posttest, but supported for the second posttest. Since a significant group difference was found in the second posttest, it signifies that music might be more effective for long-term retention rather than short-term retention, compared to recitation.

**Comparison of pilot and present study findings.** A comparison of the descriptive statistics, ANCOVAs, and questionnaires of the pilot study and the present study was made. Statistical tests revealed, overall, similar results between the present study and the pilot study. Both studies found that there were statistically significant differences between the singing and control groups in their long-term vocabulary retention, but no statistically significant difference between the groups in their short-term vocabulary retention. The singing group performed statistically significantly better than non-singing (recitation) group for their long-term vocabulary retention. In a questionnaire of both studies, students in the singing group reported that they enjoyed the language lesson with music and experienced the Din effect.

**Chapter summary.** ANCOVA and MANOVA were used for data analyses. While Chapter 4 described the results of the present research, Chapter 5 will discuss the present study and its results in relation to the existing research literature. Implications for FL teachers and recommendations for future research will also be given.

## Chapter V

### Discussion

This section discusses the present study and its results. Statistical results are discussed as they relate to the existing research literature. Recommendations are given for future research on the FL vocabulary acquisition of university students. This material is drawn together in a final section that identifies answers to the research questions that guided the present study. Finally, conclusions about the impact of the study on FL teaching and research are described.

**Overview: Answers to research questions of the present study.** In the present study the following research questions were asked:

- (1) Do university level students of Japanese remember target vocabulary with immediate recognition better when it is introduced in the context of a song?

The answer to research question (1), which was examined with a set of ANCOVA tests, was that there was no difference in vocabulary learning between the singing group and the non-singing group (see Tables 9 and 12). The findings both supported previous research (Ayotte, 2004) and contradicted previous research (Salcedo, 2002).

- (2) Do university level students of Japanese remember target vocabulary with delayed recognition better when it is introduced in the context of a song?

The answer to research question (2), which was examined with a set of ANCOVA tests, was that there was a difference in vocabulary learning between the singing and the non-singing groups (see Tables 9 and 12). This finding contradicted previous research (Ayotte, 2004; Salcedo, 2002). More details distinguishing these results from those of previous studies are provided below.

*Comparison with results of previous studies.* The present study examined the effects of the singing method on the short- and long-term vocabulary retention of university students in a FL course. Results show that there is a statistically significant difference between the vocabulary learning of the singing group and the non-singing group for long-term retention, but no statistically significant difference for short-term retention. A difference in FL content learning between a music group and a non-music group for long-term memory has been rarely documented in previous research (Ayotte [pilot study only], 2004), even though a difference in FL content learning between a music group and a non-music group for short-term memory has been documented in previous research (Kohler, 2000; Salcedo, 2002). No difference in FL content learning between a music group and a non-music group for short-term memory has been documented in previous research (Ayotte, 2004; Hirano, 2007; Wilcox, 1995). The results of the present study generally reflect the findings of previous research with university students (see page 23).

A trend observed in the present study was that the singing group scored higher than the non-singing group for the delayed second posttest, but not for the immediate first posttest. Murphey's (1990) ideas about SSIMH and Krashen's (1983) Din, as well as Suggestopedia, are reflected in these results.

This result contradicts Salcedo's (2002) study, in which the song group scored higher than the speech and control groups for immediate recall, but not for delayed recall. This might be because the studies were conducted at different times and used different research methods. Salcedo's study used traditional folksongs and romance ballads, as well as cloze tests with every seventh word of the lyrics deleted. It was conducted with beginning level learners enrolled in Spanish 101.

The differences in the set-up of the studies are the language levels of the university students/participants (the first year students vs. the second year students), the types of songs (commercial songs vs. an instructional song), the foreign languages (Spanish vs. Japanese), the length of treatment (6 class periods vs. 3 class periods), and types of the tests (cloze vs. multiple choice). Any of these factors might have affected the difference in the results of the studies, and knowing which of these factors affected the difference in the results is difficult to ascertain. Future studies could explore which of the factors result in differences in research outcomes.

The questionnaire results reveal that the singing students enjoy the language instruction with music, and that they feel that music helped them to learn the Japanese language in the lessons. This agrees with Anton's (1990) study, in which 200 students took a questionnaire and reported that they enjoyed learning by CMA and that CMA helped them learn the Spanish language.

***Implications for foreign language teachers.*** In this study, a significant influence of musical activity on participants' vocabulary acquisition was observed. The mean second posttest scores of both the experimental group ( $M = 7.00$ ) and the control group ( $M = 5.89$ ) were higher than the first posttest scores of the experimental group ( $M = 6.06$ ) and the control group ( $M = 5.56$ ), respectively. Additionally, the mean pretest score of the non-singing group ( $M = 4.22$ ) was higher than that of the singing group ( $M = 2.59$ ). Thus, overall, the singing group had greater improvement than the control group. Therefore, we can recommend using music in FL education. For example, FL teachers can develop teaching material incorporating music, such as music videos or music games, which targets specific vocabulary words, such as days of the week, numbers, and directions.

The regular instructor of the course commented that participants in the singing group appeared to be enjoying the lesson with music, as evidenced by lots of laughing in the classroom and positive comments about the song. Additionally, one student in the singing group asked on the third day of the experiment if the researcher could provide the class with the copy of the song, since the student liked the song very much but could not find it on iTunes or on the Internet. Then, the researcher had to ask the class not to listen to the song until the end of the semester and promised that she would make the song available on Blackboard (the course management system) after the semester. This was in order not to interfere with the outcome of the research by providing additional practice/input. The regular instructor during the present study informed the researcher that she intends to adopt the singing activity as a regular activity for the course during the next school year. Additionally, during the pilot study last year, the regular professor told the researcher the same thing, and the researcher had to ask her to wait one year, in order for the researcher to conduct the present study.

In the questionnaire, the singing group reported that they enjoyed the language instruction with music and that they experienced the Din effect. This shows that classroom singing can not only be effectively used to master the TL inside the classroom, but it could also extend the study time outside the class, as they inadvertently rehearse/repeat the lesson in their heads. Thus, the language lesson with music motivates students to practice/study the target vocabulary. Therefore, again, we can recommend using music in college FL education.

***Limitations of the present research.*** One of the limitations in the design of this study was that there was no true control group. Neither the experimental singing group nor the non-singing control group was taught with only traditional textbooks. Both groups were experimental in nature because they were exposed by the researcher to alternative teaching

methods in the form of extra activities with either the song or the lyrics as text, besides traditional textbook instruction by the regular instructor of the course. Since there were only two sections of the second-year Japanese foreign language class at the university, it was impossible for the researcher to have a true control group.

Another limitation in the design of this study was the use of a song (melody) that was unfamiliar to the participants with lyrics written in a foreign/second language. It did not allow L2 learners to focus solely on learning content (lyrics in the TL) since participants in a music group had to learn both lyrics and a melody, in contrast to learning only new lyrics set to a familiar melody/tune.

Another limitation in the design of this study was the testing method. The participants were not tested in the same way that they were taught the target vocabulary (singing for the experimental group and reciting for the control group). There might have been a significant difference between the two groups for short-term vocabulary retention as well, if the participants were asked to sing (singing group) or speak (control group) their answers in a language lab, instead of the paper-pencil test used in the study. Since the researcher could not obtain permission from the regular instructor to take the classes to the language lab, and since the available time was so limited, this was not feasible. Future studies could compare the testing methods, paper-pencil test versus singing/speaking, to see if the results were affected.

Another limitation involves variables that were outside this researcher's control. For example, high quality instruction by an excellent teacher may have functioned as well as the music did, which might have enabled both groups to learn equally well. Another potentially limiting variable might be the possibility that students learned or were taught the vocabulary somewhere else or through other teaching techniques.

This research had some limitations in its generalizability. For instance, this research was limited to the memory of the students that was not necessarily followed by production (speaking, writing). Retention of knowledge is not the same as being able to communicate with the knowledge. Future studies could explore whether or not people who learn vocabulary through singing would use the learned vocabulary in contexts outside of the song. This research investigated cognitively mature adults (university students). Therefore, more research will be needed to see whether or not the results of the present study can be applied to children. Also, the university students are highly motivated in learning the FL, as evidenced by their enrollment in the class. Thus, more research will be needed to see whether or not the results of the present study can be applied to more informal educational settings, such as cram schools and conversation schools.

The sampling method of this study did not have high external validity for generalization to this particular university student population because the participants were not randomly selected. In addition, each group did not have the same sample size. This research was conducted at one university in one region. This caused low external validity for generalization to other subject populations or to other settings. Future studies could remedy this issue. Another limitation of this research was due to the small sample size of the study. There was a statistical power problem. This study should be replicated with a larger sample size to remedy this issue.

***Recommendations for further research.*** In addition to the aforementioned recommendations, the results of this study could have many other implications for future research. Some statistically significant group differences were observed between the two groups for the long-term vocabulary recognition; there were also differences in each group

between the pretest and two posttests. These differences suggested that music might have a positive effect on participants' vocabulary acquisition. In order to expand on this present study, some suggestions are listed below.

One issue that this researcher was interested in was the length of the intervention and how it affected the results. The lesson lasted 18 minutes for each of the three consecutive days. However, the researcher was not sure if the period or frequency of this treatment was sufficient enough because it is unknown if the singing group could sing the song without visual aids (lyrics projected on an overhead projector) at the end of the third day. Some participants may have been able to memorize the lyrics; thus, it was hard to tell if the effect of the teaching strategy (instruction with music) was reflected in the test scores of the students. It might be better to have a longer period of treatment in the future.

On the other hand, the results of the two posttests showed a ceiling effect, with students' mean scores increasing regardless of condition (see table 8). This might have been caused by *noise* from repeating identical items from the song on each of the three tests. Thus, again, it was difficult to tell if the effect of the teaching strategy (instruction with music) was reflected in the test scores of the students. It might be better if there were more items to be learned in the lesson in the future. Also, *noise* in the research design should be controlled as much as possible.

For the reliability of the intervention and the instrument, the regular instructor of the course administered all three tests at the same point in time during the class period (at the end of the class) and gave participants the same amount of time (5 minutes) to take the test each session. Also, the regular instructor and GTAs used all words in the textbook equally in their lessons, and they excluded the verb pairs that were in the song from the chapter tests/quizzes that were

administered before the researcher's second posttest. In order to alleviate the Hawthorn effect, the students sang one Japanese popular song for another grammar point in a preceding chapter, which they were taught before the researcher's intervention. Nonetheless, the tests were found to have relatively low reliability. More specifically, the average Pearson product-moment correlation coefficients between items on the three scales (pretest, first posttest, and second posttest) were medium or small, so the tests have low reliability. Cronbach's alpha results showed that both posttests were considered unreliable, but the pretest value ( $r = .80$ ) was considered reliable. The average test-retest reliability for the singing group ( $r = .54$ ) indicated that the tests were reliable across time. However, the average test-retest reliability for the non-singing group ( $r = .16$ , negative relationship) indicated that the tests were unreliable across time. In all cases, the ceiling effect due to the *noise* in the research design (the *noise* from repetition of the same test items three times) contributed to the low reliability.

In sum, because of these implications, future studies should have a greater number of participants, a larger number of items for students to learn and a longer period of treatment. By making the test more difficult and making the gaps between the tests longer, *noise* in the research design would be controlled. In these ways, the validity and reliability of the study would be improved.

**Final conclusion.** The hypothesis that the singing group would improve their language acquisition more than the non-singing control group was correct. Since a significant group difference was found in the second posttest, it signifies that music might be more effective for long-term retention rather than short-term retention. The benefit of residual learning from the SSIMH phenomenon might have occurred. There was significant improvement, an increase in mean test scores from pre- to posttests for the singing group compared with some improvement

for the non-singing group over time. Classroom singing might serve to reinforce memory anchors for L2 learners. This study suggested that singing had a larger effect on vocabulary acquisition than did recitation. Singing is a useful pedagogical means for teaching the vocabulary of the TL (see also Mori, in press). This researcher speculates that the language lesson with music was influential, and music has great potential to help FL learners.

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## Appendix A HSCL Approval

11/9/09  
HSCL #18321

Noriko Mori  
1808 Castle Pines Court  
Lawrence, KS 66047

The Human Subjects Committee Lawrence Campus (HSCL) has received your response to its expedited review of your research project

18321 Mori/Markham (C & T) Effects of Singing on the Vocabulary Acquisition of University Japanese Foreign Language Students

and approved this project under the expedited procedure provided in 45 CFR 46.110 (f) (7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

The Office for Human Research Protections requires that your consent form must include the note of HSCL approval and expiration date, which has been entered on the consent form(s) sent back to you with this approval.

1. At designated intervals until the project is completed, a Project Status Report must be returned to the HSCL office.
2. Any significant change in the experimental procedure as described should be reviewed by this Committee prior to altering the project.
3. Notify HSCL about any new investigators not named in original application. Note that new investigators must take the online tutorial at [http://www.rcr.ku.edu/hscl/hsp\\_tutorial/000.shtml](http://www.rcr.ku.edu/hscl/hsp_tutorial/000.shtml).
4. Any injury to a subject because of the research procedure must be reported to the Committee immediately.
5. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity. If you use a signed consent form, provide a copy of the consent form to subjects at the time of consent.
6. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.

Please inform HSCL when this project is terminated. You must also provide HSCL with an annual status report to maintain HSCL approval. Unless renewed, approval lapses one year after approval date. If your project receives funding which requests an annual update approval, you must request this from HSCL one month prior to the annual update. Thanks for your cooperation. If you have any questions, please contact me.

Sincerely,

Jan Butin  
HSCL Associate Coordinator  
University of Kansas

## **Appendix B Informed Consent Form**

### FOREIGN LANGUAGE WORD LEARNING CONSENT STATEMENT

You are invited to participate in a research program on foreign-language word learning conducted by Noriko Mori. The Department of Curriculum & Teaching at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

### PURPOSE OF THE STUDY

The purpose of this study is to examine the effects of a teaching strategy on foreign-language word learning by comparing the number of Japanese words recalled by university students who are assigned to an experimental group with those in a control group.

### PROCEDURES

You will be asked to participate in a Japanese language learning activity and to take a total of three vocabulary tests. The activity lasts approximately 15 minutes during three 50-minute class periods. The tests are multiple-choice, and each test has approximately 15 questions. You will be asked to take the first test at the beginning of the lesson on the first day, and the second test at the end of the lesson on the third day. During the second test, you will also be asked to complete a language background questionnaire related to your experience with the Japanese language and with the learning activity. A few weeks after the lesson, you will be asked to take the third test. The test scores will not affect your semester grade in the Japanese course. All procedures will be conducted in English and Japanese.

### RISKS

No risks are anticipated.

### BENEFITS

The findings of this study can bring new insight for understanding a better teaching strategy in foreign language word learning. It may be used to develop educational curricula to enhance foreign language word learning. It might directly benefit the participants in the study, if their learning is enhanced by the teaching strategy and the class activity used in the lesson. Effective and efficient instruction is always an important topic for educators, especially at the college level.

### PAYMENT TO PARTICIPANTS

Participants will not be paid.

### PARTICIPANT CONFIDENTIALITY

Your name will not be associated in any way with the information collected about you or with

the research findings from this study. The researcher will use a study number or a pseudonym instead of your name. The researchers will not share information about you unless required by law or unless you give written permission.

Permission granted on this date to use and disclose your information remains in effect indefinitely. By signing this form you give permission for the use and disclosure of your information for purposes of this study at any time in the future.

#### REFUSAL TO SIGN CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

#### CANCELLING THIS CONSENT AND AUTHORIZATION

You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose information collected about you, in writing, at any time, by sending your written request to Noriko Mori, at Department of Curriculum & Teaching, 1122 West Campus Rd., JRP 321, Lawrence, KS 66045, (785-864-4435; norikoto@ku.edu). If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

#### QUESTIONS ABOUT PARTICIPATION

Questions about procedures should be directed to the researcher(s) listed at the end of this consent form.

#### PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or (785) 864-7385, write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, or email mdenning@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.

\_\_\_\_\_  
Type/Print Participant's Name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Participant's Signature

Researcher Contact Information

Noriko Mori

Principal Investigator

Department of Curriculum & Teaching

Paul Markham, Ph.D.

Faculty Supervisor

Department of Curriculum & Teaching

1122 West Campus Road, JRP 321  
University of Kansas  
Lawrence, KS 66045  
(785) 864 4435

1122 West Campus Road, JRP 440  
University of Kansas  
Lawrence, KS 66045  
(785) 864 9677

## Appendix C-1 Pretest (Pilot Study)

Your assigned number \_\_\_\_\_

Transitive verbs are always followed by a noun object, while intransitive verbs are not.

Examples of transitive verbs: I **raise** my hand. I **lay** my head down.

Examples of intransitive verbs: The price **rises**. I **lie** down upon my bed.

Choose the correct intransitive forms for the following transitive verbs by filling in the bubble next to the correct answer.

**1** 開(あ)ける to open

- A) 開る  
 B) 開く  
 C) 開がさせる  
 D) 開ぐる

**5** 閉(し)める to close

- A) 閉ます  
 B) 閉まるる  
 C) 閉る  
 D) 閉まる

**2** つづける to continue

- A) つづる  
 B) つづく  
 C) つづます  
 D) つづさせる

**6** のせる to place on

- A) のす  
 B) のせす  
 C) のる  
 D) のする

**3** かえる to change

- A) かす  
 B) かえす  
 C) かわる  
 D) かえさせる

**7** 直(なお)す to fix, cure

- A) 直られる  
 B) 直れる  
 C) 直る  
 D) 直せる

**4** たてる to build

- A) たてられる  
 B) たちる  
 C) たつ  
 D) たつる

**8** 入(い)れる to put in

- A) 入(はい)る  
 B) 入(はい)れる  
 C) 入(い)る  
 D) 入(はい)られる

(over)

Choose the correct transitive forms for the following intransitive verbs by filling in the bubble next to the correct answer. A translation of the transitive verbs is provided.

**9** 決(き)まる to decide

- A) 決ます
- B) 決める
- C) 決る
- D) 決めれる

**13** やける to bake, burn

- A) やく
- B) やけす
- C) やる
- D) やかせる

**10** まちがう to make a mistake

- A) まちがる
- B) まちがらる
- C) まちがいる
- D) まちがえる

**14** 上(あ)がる to raise

- A) 上る
- B) 上げる
- C) 上がれる
- D) 上ぐる

**11** 始(はじ)まる to begin

- A) 始る
- B) 始まらる
- C) 始める
- D) 始ます

**15** つく to turn on

- A) つぎれる
- B) つる
- C) つくる
- D) つける

**12** わく to boil

- A) わかす
- B) わこす
- C) わす
- D) わきる

**16** 出(で)る to take out

- A) 出(だ)る
- B) 出(で)えす
- C) 出(だ)す
- D) 出(で)す

## Appendix C-2 First Posttest (Pilot Study)

Your assigned number \_\_\_\_\_

Transitive verbs are always followed by a noun object, while intransitive verbs are not.

Examples of transitive verbs: I **raise** my hand. I **lay** my head down.

Examples of intransitive verbs: The price **rises**. I **lie** down upon my bed.

Choose the correct intransitive forms for the following transitive verbs by filling in the bubble next to the correct answer.

1 終(お)える to finish

- A) 終わる  
 B) 終えす  
 C) 終る  
 D) 終えられる

5 おとす to drop

- A) おとる  
 B) おてる  
 C) おちる  
 D) おてさせる

2 入(い)れる to put in

- A) 入(はい)る  
 B) 入(はい)れる  
 C) 入(い)る  
 D) 入(はい)られる

6 のこす to leave over

- A) のこらる  
 B) のこさる  
 C) のこられる  
 D) のこる

3 開(あ)ける to open

- A) 開る  
 B) 開く  
 C) 開がさせる  
 D) 開ぐる

7 直(なお)す to fix, cure

- A) 直られる  
 B) 直れる  
 C) 直る  
 D) 直せる

4 かける to make a phone call

- A) かる  
 B) かかる  
 C) かく  
 D) かくる

8 かえる to change

- A) かす  
 B) かえす  
 C) かわる  
 D) かえさせる

(over)

Choose the correct transitive forms for the following intransitive verbs by filling in the bubble next to the correct answer. A translation of the transitive verbs is provided.

9 始(はじ)まる to begin

- A) 始る
- B) 始まるる
- C) 始める
- D) 始ます

13 あつまる to gather

- A) あつめらる
- B) あつまるる
- C) あつめる
- D) あつらる

10 きえる to turn off

- A) けす
- B) けえす
- C) きる
- D) きえられる

14 決(き)まる to decide

- A) 決ます
- B) 決める
- C) 決る
- D) 決めれる

11 やける to bake, burn

- A) やく
- B) やけす
- C) やる
- D) やかせる

15 つく to turn on

- A) つぎれる
- B) つる
- C) つくる
- D) つける

12 起きる to wake up

- A) 起きらる
- B) 起る
- C) 起きす
- D) 起こす

16 かえる to return

- A) かす
- B) かえす
- C) かえらる
- D) かえられる

## Appendix C-3 Second Posttest (Pilot Study)

Your assigned number \_\_\_\_\_

Transitive verbs are always followed by a noun object, while intransitive verbs are not.

Examples of transitive verbs: I **raise** my hand. I **lay** my head down.

Examples of intransitive verbs: The price **rises**. I **lie** down upon my bed.

Choose the correct intransitive forms for the following transitive verbs by filling in the bubble next to the correct answer.

**1** かける to make a phone call

- A) かる  
 B) かかる  
 C) かく  
 D) かくる

**5** 入(い)れる to put in

- A) 入(はい)る  
 B) 入(はい)れる  
 C) 入(い)る  
 D) 入(はい)られる

**2** 直(なお)す to fix, cure

- A) 直られる  
 B) 直れる  
 C) 直る  
 D) 直せる

**6** かえる to change

- A) かす  
 B) かえす  
 C) かわる  
 D) かえさせる

**3** 開(あ)ける to open

- A) 開る  
 B) 開く  
 C) 開がさせる  
 D) 開くる

**7** のこす to leave over

- A) のこらる  
 B) のこさる  
 C) のこられる  
 D) のこる

**4** 閉(し)める to close

- A) 閉ます  
 B) 閉まらる  
 C) 閉る  
 D) 閉まる

**8** のせる to place on

- A) のす  
 B) のせす  
 C) のる  
 D) のする

(over)

Choose the correct transitive forms for the following intransitive verbs by filling in the bubble next to the correct answer. A translation of the transitive verbs is provided.

**9** 決(き)まる to decide

- A) 決ます
- B) 決める
- C) 決る
- D) 決めれる

**13** つく to turn on

- A) つぎれる
- B) つる
- C) つくる
- D) つける

**10** かえる to return

- A) かす
- B) かえす
- C) かえらる
- D) かえられる

**14** わく to boil

- A) わかす
- B) わこす
- C) わす
- D) わきる

**11** 始(はじ)まる to begin

- A) 始る
- B) 始まる
- C) 始める
- D) 始ます

**15** 出(で)る to take out

- A) 出(だ)る
- B) 出(で)えす
- C) 出(だ)す
- D) 出(で)す

**12** きえる to turn off

- A) けす
- B) けえす
- C) きる
- D) きえられる

**16** やける to bake, burn

- A) やく
- B) やけす
- C) やる
- D) やかせる

Thank you for your participation.

## Appendix C-4 Pretest (Present Study)

Your name \_\_\_\_\_

Transitive verbs are always followed by a noun object, while intransitive verbs are not.

Examples of transitive verbs: I **raise** my hand. I **lay** my head down.

Examples of intransitive verbs: The price **rises**. I **lie** down upon my bed.

Choose the correct intransitive forms for the following transitive verbs by filling in the bubble next to the correct answer.

**1** 開(あ)ける to open

- A) 開る
- B) 開く
- C) 開けられる
- D) 開ぐる

**5** 閉(し)める to close

- A) 閉ます
- B) 閉まるる
- C) 閉る
- D) 閉まる

**2** つづける to continue

- A) つづる
- B) つづく
- C) つづます
- D) つづさせる

**6** のせる to place on

- A) のす
- B) のせす
- C) のる
- D) のする

**3** かえる to change

- A) かす
- B) かえす
- C) かわる
- D) かえせる

**7** 直(なお)す to fix, cure

- A) 直られる
- B) 直れる
- C) 直る
- D) 直せる

**4** たてる to build

- A) たてられる
- B) たちる
- C) たつ
- D) たつる

**8** 入(い)れる to put in

- A) 入(はい)る
- B) 入(はい)れる
- C) 入(い)る
- D) 入(はい)られる

(over)

Choose the correct transitive forms for the following intransitive verbs by filling in the bubble next to the correct answer. A translation of the transitive verbs is provided.

**9** 決(き)まる to decide

- A) 決ます
- B) 決める
- C) 決る
- D) 決めれる

**13** やける to bake, burn

- A) やく
- B) やけす
- C) やる
- D) やかせる

**10** まちがう to make a mistake

- A) まちがる
- B) まちがらる
- C) まちがいる
- D) まちがえる

**14** 上(あ)がる to raise

- A) 上る
- B) 上げる
- C) 上がれる
- D) 上ぐる

**11** 始(はじ)まる to begin

- A) 始る
- B) 始まるる
- C) 始める
- D) 始めらる

**15** つく to turn on

- A) つけれる
- B) つけ
- C) つくる
- D) つける

**12** わく to boil

- A) わかす
- B) わこす
- C) わす
- D) わきる

**16** 出(で)る to take out

- A) 出(だ)る
- B) 出(で)えす
- C) 出(だ)す
- D) 出(で)す

### Appendix C-5 First Posttest (Present Study)

Your name \_\_\_\_\_

Transitive verbs are always followed by a noun object, while intransitive verbs are not.

Examples of transitive verbs: I **raise** my hand. I **lay** my head down.

Examples of intransitive verbs: The price **rises**. I **lie** down upon my bed.

Choose the correct intransitive forms for the following transitive verbs by filling in the bubble next to the correct answer.

**1** 終(お)える to finish

- A) 終わる
- B) 終えす
- C) 終る
- D) 終えられる

**5** おとす to drop

- A) おとる
- B) おてる
- C) おちる
- D) おてさせる

**2** 入(い)れる to put in

- A) 入(はい)る
- B) 入(はい)れる
- C) 入(い)る
- D) 入(はい)られる

**6** のこす to leave over

- A) のこらる
- B) のこさる
- C) のこられる
- D) のこる

**3** 開(あ)ける to open

- A) 開る
- B) 開く
- C) 開けられる
- D) 開ぐる

**7** 直(なお)す to fix, cure

- A) 直られる
- B) 直れる
- C) 直る
- D) 直せる

**4** かける to make a phone call

- A) かる
- B) かかる
- C) かく
- D) かくる

**8** かえる to change

- A) かす
- B) かえす
- C) かわる
- D) かえせる

(over)

Choose the correct transitive forms for the following intransitive verbs by filling in the bubble next to the correct answer. A translation of the transitive verbs is provided.

9 始(はじ)まる to begin

- A) 始る
- B) 始まる
- C) 始める
- D) 始めらる

13 あつまる to gather

- A) あつめらる
- B) あつまらる
- C) あつめる
- D) あつらる

10 きえる to turn off

- A) けす
- B) けえす
- C) きる
- D) きえられる

14 決(き)まる to decide

- A) 決ます
- B) 決める
- C) 決る
- D) 決めれる

11 やける to bake, burn

- A) やく
- B) やけす
- C) やる
- D) やかせる

15 つく to turn on

- A) つけれる
- B) つけ
- C) つくる
- D) つける

12 起きる to wake up

- A) 起きらる
- B) 起る
- C) 起きす
- D) 起こす

16 かえる to return

- A) かす
- B) かえす
- C) かえらる
- D) かえられる

**Questionnaire for pilot study and present study (distributed with the first posttest):**

**Please fill out your demographic information.**

Major: \_\_\_\_\_ Gender:  Male  Female

Nationality/Citizenship: \_\_\_\_\_ Age: \_\_\_\_\_

Student status:  Undergraduate  Graduate

Q1. How many semesters have you studied Japanese? \_\_\_\_\_

Q2. Have you ever been to Japan?  Yes  No

Q3. If yes to Q2, how long did you stay in Japan? \_\_\_\_\_

[For the singing group] **Directions: Please complete the following questions honestly and to the best of your knowledge.**

Q4. Have you ever heard this song before?  Yes  No

Q5. Have you had musical training?  Yes  No

Q6. If yes to Q5, how long and what type of training did you receive? If none of the musical training applies, please list your training as "Other."

\_\_\_\_\_ year(s) of learning on your own (self-taught), or with friends

\_\_\_\_\_ year(s) of private lessons

\_\_\_\_\_ year(s) of school/church band, choir, orchestra

\_\_\_\_\_ year(s) of community band or choir, or other small ensemble

\_\_\_\_\_ year(s) of other(s) \_\_\_\_\_

Q7. How much do you think the music helped you to learn the Japanese language in these lessons?

Not at all 1          2          3 Some          4          5 A lot

Q8. If you answered from 2 to 5 on Q7, which aspect of music helped you? (Check as many as apply.)

Melody (a tune, especially the main tune in a piece of music written for several instruments or voices)

Rhythm (a strong regular repeated pattern of sounds)

Tempo (the speed of a piece of music)

Q9. If you answered from 2 to 5 on Q7, which aspect of language was improved by the music heard in the lessons? (Check as many as apply)

Vocabulary     Grammar     Pronunciation     Culture

Q10. Did you like these language lessons with music?     Yes     No

Please explain: \_\_\_\_\_

Q11. When taking this test, how much did you use the song's melody to recall the vocabulary words (transitive/intransitive verbs)?

Not at all 1            2            3 Some            4            5 A lot

Q12. When taking this test, how much did you use the song's rhythm to recall the vocabulary words (transitive/intransitive verbs)?

Not at all 1            2            3 Some            4            5 A lot

Q13. When taking this test, how much did you use the song's tempo to recall the vocabulary words (transitive/intransitive verbs)?

Not at all 1            2            3 Some            4            5 A lot

Q14. After we sang in class, how much did the words from the song play back in your head?

Not at all 1            2            3 Some            4            5 A lot

Q15. If anything was left out of the questionnaire about your Japanese language learning, please provide any relevant comments.

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Thank you for your participation.

### Appendix C-6 Second Posttest (Present Study)

Your name \_\_\_\_\_

Transitive verbs are always followed by a noun object, while intransitive verbs are not.

Examples of transitive verbs: I **raise** my hand. I **lay** my head down.

Examples of intransitive verbs: The price **rises**. I **lie** down upon my bed.

Choose the correct intransitive forms for the following transitive verbs by filling in the bubble next to the correct answer.

**1** かける to make a phone call

- A) かる
- B) かかる
- C) かく
- D) かくる

**5** 入(い)れる to put in

- A) 入(はい)る
- B) 入(はい)れる
- C) 入(い)る
- D) 入(はい)られる

**2** 直(なお)す to fix, cure

- A) 直られる
- B) 直れる
- C) 直る
- D) 直せる

**6** かえる to change

- A) かす
- B) かえす
- C) かわる
- D) かえせる

**3** 開(あ)ける to open

- A) 開る
- B) 開く
- C) 開けられる
- D) 開ぐる

**7** のこす to leave over

- A) のこらる
- B) のこさる
- C) のこられる
- D) のこる

**4** 閉(し)める to close

- A) 閉ます
- B) 閉まらる
- C) 閉る
- D) 閉まる

**8** のせる to place on

- A) のす
- B) のせす
- C) のる
- D) のする

(over)

Choose the correct transitive forms for the following intransitive verbs by filling in bubble next to the correct answer. A translation of the transitive verbs is provided.

- |  |   |
|--|---|
| <p><b>9</b> 決(き)まる to decide</p> <p>A) 決ます</p> <p>B) 決める</p> <p>C) 決る</p> <p>D) 決めれる</p>   | <p><b>13</b> つく to turn on</p> <p>A) つけれる</p> <p>B) つけ</p> <p>C) つくる</p> <p>D) つける</p>              |
| <p><b>10</b> かえる to return</p> <p>A) かす</p> <p>B) かえす</p> <p>C) かえらる</p> <p>D) かえられる</p>   | <p><b>14</b> わく to boil</p> <p>A) わかす</p> <p>B) わこす</p> <p>C) わす</p> <p>D) わきる</p>                  |
| <p><b>11</b> 始(はじ)まる to begin</p> <p>A) 始る</p> <p>B) 始まらる</p> <p>C) 始める</p> <p>D) 始めらる</p> | <p><b>15</b> 出(で)る to take out</p> <p>A) 出(だ)る</p> <p>B) 出(で)えす</p> <p>C) 出(だ)す</p> <p>D) 出(で)す</p> |
| <p><b>12</b> きえる to turn off</p> <p>A) けす</p> <p>B) けえす</p> <p>C) きる</p> <p>D) きえられる</p>   | <p><b>16</b> やける to bake, burn</p> <p>A) やく</p> <p>B) やけす</p> <p>C) やる</p> <p>D) やかせる</p>           |

[For the singing group]

Q1. After we sang the song in class, did you hear the song somewhere else, for instance on the Internet? \_\_Yes \_\_No

Q2. If yes to Q1, how many times did you hear the song outside the class? \_\_\_\_\_times

Thank you for your participation.

## Appendix D-1 Song

## おまかせロボット第1号

めざ めのご気分は <sup>きぶん</sup> いかがですか。

ご主人 <sup>しゅじん</sup> さま <sup>けさ</sup> 今朝 <sup>ひ</sup> は やけに 冷えますね。

「おはようございます。」

カーテンを <sup>あ</sup> 開けましょう。「開きました。」

ストーブを <sup>あ</sup> つけましょう。「つきました。」

トーストをやきましょう。「やけました。」

コーヒーを <sup>い</sup> 入れましょう。「はい、コーヒーが <sup>はい</sup> 入りました。」

サラダも <sup>つく</sup> 作りますね。「できました。」

ご主人 <sup>しゅじん</sup> さま <sup>しんせん</sup> 新鮮なフルーツは <sup>い</sup> かがですか。

おまかせ。「おまかせください。」

おまかせ。「わたくしに。」

おまかせロボット <sup>だい</sup> 第 <sup>ごう</sup> 1号。

タオル <sup>いま</sup> 今かえましょう。「かわりました。」

<sup>かみ</sup> 髪の毛のくせなおしましょう。「なおりました。」

<sup>くじはん</sup> 9時半 から「ミーティングを」<sup>はじ</sup> 始めましょう。「<sup>はじ</sup> 始まりました。」

スケジュールを <sup>き</sup> 決めましょう。「<sup>き</sup> 決まりました。え～ <sup>ほんじつ</sup> 本日の <sup>よてい</sup> ご予約は……」

<sup>よじ</sup>4時から プレゼンですね。

ご<sup>しゅじん</sup>主人 <sup>さま</sup> <sup>みずいろ</sup>水色のスーツが おにあいですよ。

<sup>い</sup>行ってらっしゃい。「<sup>い</sup>行ってきます。」

<sup>い</sup>行ってらっしゃい。「<sup>い</sup>じゃ、たのんだよ。」

すてきな<sup>いちにち</sup>1日 で ありますように。

おまかせ。「おまかせください。」

おまかせ。「<sup>い</sup>るすばんも おまかせ。」

おまかせロボット<sup>だい ごと</sup>第1号。

## Appendix D-2 English Translation of the Song

### Servant robot No. 1

#### 1st verse

How are you today? Did you wake up feeling well?

It is very cold this morning, sir. Good morning.

I open the curtain.                    The curtain is opened.

I turn on the heater.                    The heater is on.

I make toast.                            The toast is made.

I put coffee in.                        The coffee is put in.

I also make salad.    The salad is ready.

Would you like some fresh fruit, sir?

Leave it to me.    Leave it to me.

I am a servant robot No.1

#### 2nd verse

I change the towel.                    The towel is changed.

I fix your tousled hair.                The tousled hair is fixed.

I begin the meeting at 9:30. The meeting began.

I decide a schedule.    Today's schedule is decided.

Your schedule will be (pause) a presentation at 4pm.

You look good in the blue suit, sir.

(Robot:) See you later.    (Master:) I'm leaving.

(Robot:) Good bye.    (Master:) I will let you handle everything.

(Robot:) Have a great day!    Leave it to me.

I will house sit. I am a servant robot No.1.

## Appendix E Lesson Plan

### Singing group

#### Day 1

1. The researcher played the compact disk (CD) of Version A while the students listened.

After listening, both the English translation and the Japanese lyrics were shown on the digital projector.

2. Line-by-line rote learning: The researcher sang one line as a model, followed by the group repeating each line. The English translation of the target verbs was shown on the projector.

3. The researcher showed the Japanese Transitive/Intransitive verb table.

The researcher played the CD (Version A) while the students listened once more.

#### Day 2

1. An English translation of the song, a vocabulary list, and a written cloze of the song, with the target vocabulary words omitted, were handed out. The researcher played Version B of the song while the students listened.

2. The researcher played Version B of the song three times while the students filled in the verbs they heard. Next, as a class, the students volunteered their responses, and all proper verb pairs were shown on the overhead projector. The students wrote the correct answers on their handouts.

3. The whole class sang along with the CD of the song (Version B), while looking at the lyrics on the projector or on their written cloze.

#### Day 3

1. The researcher played Version B of the song while the students listened.

2. Half of the class sang the transitive verbs, and the other half of the class sang the intransitive

verbs along with the CD of the song (Version B). Then, they alternated their roles.

### 3. Posttest

#### **Control group**

##### Day 1

1. The researcher played a prerecorded reading (Version A') while the students listened.

After listening, both the English translation and the Japanese text were shown on the projector.

2. Line-by-line rote learning: The researcher spoke one line as a model, followed by the group repeating each line. The English translation of the target verbs was shown on the projector.

3. The researcher showed the Japanese Transitive/Intransitive verb table.

The researcher played the prerecorded reading (Version A') while the students listened once more.

##### Day 2

1. An English translation of the song, a vocabulary list, and a written cloze of the song, with the target vocabulary words omitted, were handed out. The researcher played the reading (Version B') while the students listened.

2. The researcher played the reading (Version B') three times while the students filled in the verbs they heard. Next, as a class, the students volunteered their responses, and all proper verb pairs were shown on the overhead projector. The students wrote the correct answers on their handouts.

3. The whole class read the text out loud along with the CD of the spoken song lyrics (Version B'), while looking at the lyrics on the projector or on their written cloze.

##### Day 3

1. The researcher played the reading of Version B' while the students listened.

2. Half of the class spoke the transitive verbs, and the other half of the class spoke the intransitive verbs along with the CD of the spoken song lyrics (Version B'). Then, they alternated their roles.

3. Posttest

### Appendix F-1 Correlation Matrices for Three Tests (Pilot Study)

#### Pretest

Item 2	.280						
Item 3	.278	-.018					
Item 4	.375	-.024	.538**				
Item 5	.096	-.150	-.018	.163			
Item 6	.478*	.190	.324	.335	.190		
Item 7	.469*	.464*	.478*	.375	-.088	.278	
Item 8	.344	.398	.273	.095	-.163	.071	.703**
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7

\* $p < .05$ , \*\* $p < .01$

#### First Posttest

Item 2	-.142						
Item 3	.511*	-.183					
Item 4	.314	.211	.167				
Item 5	-.011	.519*	.098	.167			
Item 6	.337	.069	.335	.225	-.071		
Item 7	.465*	-.066	.359	.405	-.127	.266	
Item 8	.265	.452*	.168	.211	.168	.069	-.066
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7

\* $p < .05$

## Second Posttest

Item 2	.	a					
Item 3	.550**	.	a				
Item 4	-.098	.	a	-.178			
Item 5	-.187	.	a	-.079	.292		
Item 6	.266	.	a	.219	.572**	.016	
Item 7	1.000**	.	a	.550**	-.098	-.187	.266
Item 8	-.066	.	a	.339	-.142	.352	-.247
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7

\* $p < .05$ , \*\* $p < .01$

<sup>a</sup> Cannot be computed because at least one of the variables is constant.

### Appendix F-2 Correlation Matrices for Three Tests (Present Study)

Pretest

Item 2	.104						
Item 3	.158	.603**					
Item 4	.030	.455*	.693**				
Item 5	.098	.570**	.617**	.428*			
Item 6	-.053	.282	.320	.272	.062		
Item 7	.405*	.520**	.480*	.332	.296	.259	
Item 8	.167	.469*	.433*	.300	.267	.234	.491*
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7

\* $p < .05$ , \*\* $p < .01$

First Posttest

Item 2	-.127						
Item 3	.079	.133					
Item 4	.287	.177	.177				
Item 5	.023	.285	-.332	.105			
Item 6	.480*	.058	.058	.077	.123		
Item 7	.324	-.198	.374	.496**	.052	.286	
Item 8	-.127	-.158	-.158	.397*	.150	-.068	.348
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7

\* $p < .05$ , \*\* $p < .01$

## Second Posttest

Item 2	. <sup>a</sup>						
Item 3	. <sup>a</sup>	-.072					
Item 4	. <sup>a</sup>	.410*	.435*				
Item 5	. <sup>a</sup>	-.275	.263	-.055			
Item 6	. <sup>a</sup>	.330	-.219	.364	-.105		
Item 7	. <sup>a</sup>	1.000**	-.072	.410*	-.275	.330	
Item 8	. <sup>a</sup>	-.040	-.072	.410*	-.275	.330	-.040
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7

\* $p < .05$ , \*\* $p < .01$

<sup>a</sup> Cannot be computed because at least one of the variables is constant.