

Increasing fluency in L2 writing with singing

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Abstract

Fluency is an essential part of a language learner's skills. Despite various studies on fluency, little is known about the effects of different pedagogical methods on the development of written fluency. In this paper, we examine how different pedagogical methods affect the development of second language learners' written fluency. Participants in this study were 51 language learners enrolled in two intensive Finnish courses. The pedagogical methods investigated in the study were singing, listening to songs, and reciting lyrics of songs. Written stories based on cartoon strips were used as a pretest and a posttest. The fluency of written stories was analyzed based on the number of words used in the texts. Differences between the groups taught by different pedagogical methods were analyzed. The results seem to indicate that fluency increased the most in the singing groups compared to the other groups. There was also a statistically significant difference between the singing group and the group reciting lyrics, as well as between the group listening to songs and the group reciting lyrics.

Keywords: fluency; L2 writing; singing

1. Introduction

Fluency plays an important role in language production. Language learners are often judged as fluent users of language if they use their second language with ease and in a native-like way (Housen, Kuiken, & Vedder, 2012). According to Chenoweth and Hayes (2001), written fluency is especially important for second language (L2) learners' success in their studies. Investigating fluency, as well as accuracy and complexity, is a popular topic within second language acquisition studies (see e.g., Housen et al., 2012). However, little attention has been paid to the relationship between different pedagogical methods and fluency in L2 writing.

A number of studies have reported the benefits of music and singing for learning (see e.g., Legg, 2009; Medina, 2000). Music stimulates memory and increases motivation and interest in learning situations (Abbott, 2002; Eerola & Saarikallio, 2010, pp. 265-266; Stansell, 2005). Singing, in turn, makes learning processes more efficient by activating both brain hemispheres simultaneously and combining language learning with emotions (Lake, 2002, pp. 102-103). Recent neuroimaging studies have shown that music and language are intertwined on the neural level (Besson, Schön, Moreno, Santos, & Magne, 2007; Putkinen, Tervaniemi, Saarikivi, de Vent, & Huotilainen, 2014), and that music can improve language skills (Moreno, Marques, Santos, Santos, Castro, & Besson, 2009). Previous studies have found that singing has a positive effect on second language learning, especially on vocabulary (Coyle & Gómez García, 2014; Legg, 2009). However, little is known about how singing and music affect written fluency.

The objective of this study is to investigate how three different pedagogical methods affect written fluency in stories by 51 learners of Finnish. The pedagogical methods used in the study are singing, listening to songs and reciting the lyrics of the same songs. The data were collected by a pretest and a posttest in which students wrote stories based on comic strips. Both qualitative and quantitative methods were used to analyze the data.

The article is divided into five sections. The first section lays out the theoretical dimensions of the research and looks at how singing affects language learning. The second section explains the methodology of the study. The third section includes results, focusing on how the different pedagogical approaches affect written fluency. In the fourth section, we discuss the results and their implications. Finally, conclusions and areas for further research are discussed.

1.1. Effect of singing on learning

The first serious discussions and analyses of the effect of music on learning emerged during the 1970s with a study by Hurwitz, Wolff, Bortnick, and Kokás (1975), in

which they found that children's literacy skills were enhanced with musical practices. In recent years, a number of other studies have shown that music and singing have positive effects on learning (Abbott, 2002; Legg, 2009; Stansell, 2005). Recent evidence from studies examining language learning suggests that music and singing greatly enhance verbatim recall and receptive learning of vocabulary and grammar (Alisaari, 2015; Coyle & Gómez Gracia, 2014; Dowling, Tillmann, & Ayers, 2002; Legg, 2009; Ludke, Ferreira, & Overy, 2014; Medina, 2000; Murphey, 1990).

Previous studies have investigated the effects of singing, melody and rhythm on language learning. A number of studies have reported that melody combined with language helps learners memorize words more efficiently than mere linguistic input (Ludke et al., 2014; Sammler et al., 2010; Thaut, Peterson, & McIntosh, 2005; Yalch, 1991). Furthermore, it has been suggested that along with melody, rhythm enhances word memorization more than traditional ways of presenting language. Some studies suggest that rhythm is, in fact, the most essential element in musical presentation for language learning (Purnell-Webb & Speelman, 2008; Stahl, Kotz, Henseler, Turner, & Geyer, 2011). However, if the musical or rhythmic presentation is too difficult, it may impede learning (Racette & Peretz, 2007; Wallace, 1994). A study by Ludke et al. (2014) investigated how singing, rhythmical speech and normal speech affected the learning of a Hungarian text; the results indicated that singing is the most efficient method for learning to memorize a text.

So far, very few studies have investigated the effects of music on language learning in a classroom setting (Sposet, 2008). In the language classroom, the positive effects of singing are not limited to memorizing words or grammar. Learners are able to participate in singing from the beginning of their language studies (Domoney & Harris, 1993). Learners at the beginners' level may sing a song's chorus at first and gradually broaden their participation (Lake, 2002, p. 100). Furthermore, singing together provides learners with more opportunities to practice producing the target language. As a result, singing may assist the development of fluency for L2 learners.

1.2. Fluency in second language writing

In second language acquisition research, fluency is generally defined as the language user's ability to produce language at normal speed without interruptions (Skehan, 2009, p. 510), or as the automatic production of language (Segalowitz, 2000). Written fluency is generally determined through analyzing the number of words in a written text, the text's length (see e.g., Fathman & Whalley, 1990, p. 185; Reid, 1990, p. 195), or the amount of time used for writing (Chenowith & Hayes, 2001, p. 84; Skehan, 2009, p. 511). Fluency has also been determined as the number of corrections the

learner makes (Knoch, 2007), although Abdel Latif (2012) argues that corrections may not be related to writing fluency. Alisaari and Heikkola (2014) have also previously shown that between a pretest and a posttest there was no difference in corrections measured as actual words and percentages. Due this, in this paper, we measure fluency by examining the number of words produced in a limited time.

The language learner's knowledge of the target language affects fluency. Fluency increases when the language learner's knowledge of grammar and vocabulary grows (Chenowith & Hayes, 2001, p. 89; Williams, 2012, p. 322). The more fluent the writer is, the less conscious attention is needed for producing single words. If spelling requires extensive attention, the writer may not be able to focus on the content of the text while writing (Chenowith & Hayes, 2001, p. 82). In addition, according to Housen et al. (2012), more automatic language processing leads to more fluent production of language. Towell (2012, p. 56) also argues that a learner is fluent if his or her knowledge is "available via practiced processes." The more automatic the recall of a language pattern, the easier and more fluent the production becomes (Towell, 2012).

Recent evidence suggests that input plays an essential role in the development of fluency (see e.g., Williams, 2012, p. 322). In this study, we assume that music is important for written fluency because singing stimulates memory, and memory has been shown to play a major role in both the writing process and written fluency (Chenowith & Hayes, 2001, p. 84; Skehan, 2009, p. 511). Towell states that "it is through language production that what is learnt becomes proceduralized and stored in memory in way which (a) make it accessible in real-time and (b) give it an economic and stable form" (2012, p. 61). Through singing, the language learner can practice using the target language, while the melody of the song helps the learner memorize words and patterns in the language.

The aim of this study is to investigate how different teaching methods affect written fluency. We examine whether singing, listening to songs, and reciting song lyrics have different effects on the development of written fluency. Our hypothesis is that singing increases written fluency more than other methods, since singing has already been shown in many studies to benefit language learning (see e.g., Coyle & Gómez Garcia, 2014; Ludke et al., 2014; Schön, Boyer, Moreno, Besson, Peretz, & Kolinsky, 2008). Our second hypothesis is that reciting lyrics increases written fluency more than listening to songs, since rhythm has been shown to be an important factor in language learning (Purnell-Webb & Speelman, 2008).

2. Method

In this section, we present the participants of the study, the three teaching methods under investigation, and our methods for collecting and analyzing data.

2.1. Participants

Two intensive courses in Finnish were organized by one Finnish university in cooperation with the Center for International Mobility (CIMO). The courses were organized simultaneously and lasted for approximately four weeks. The course participants ($n = 67$) were preselected for Course I or IIA by CIMO and the local course organizers based on their Finnish language proficiency. All 67 participants gave their written consent to participate in the research. The participants in Course I had studied Finnish for 0.5 to 1 year, and they were mainly at the A1-A2 language proficiency level (Council of Europe, 2011). The participants in Course IIA had studied Finnish for 1 to 2 years, and they were at the A2-B1 language proficiency level (Council of Europe, 2011). All the participants were university students between the ages of 18 and 33, mainly from Europe and North America. Originally, the language proficiency levels were evaluated by the participants' teachers at their home universities. Later, the levels were re-evaluated by the authors.

On the first day of the courses, the students took a test given by the course organizers. The test focused on grammatical knowledge and tested mainly passive knowledge of the language. Based on the test, the students in each course were divided into three groups, and altogether six different groups were formed, as shown in Table 1. The authors of the study had influence neither over this test nor the group division. The division made by the organizers was not ideal for the purpose of the study, but since this was a classroom study, the authors had to settle for these conditions.

Table 1 The division into groups in Course I and Course IIA made by the organizers

Course I			Course IIA		
Singing group I $n = 11$	Listening group I $n = 10$	Reciting group I $n = 12$	Singing group IIA $n = 11$	Listening group IIA $n = 11$	Reciting group IIA $n = 12$

In this study, we examined the effect of three different teaching methods on written fluency: singing, listening to songs, and reciting song lyrics. At both course levels, singing was assigned to the weakest group, listening to songs to the middle group, and reciting song lyrics to the strongest group based on the test given by the course organizers, which mostly tested grammatical knowledge. In an ideal research setting, all the groups would have been balanced by their language proficiency. However, the differences in the language proficiency levels between the different groups were not great.

Since the original language proficiency level estimates were made by many different teachers, the authors re-evaluated the participants' written language proficiency levels according to the common European framework of ref-

erence (Council of Europe, 2011). The evaluations were based on the texts written for the pretest of the study in order to have more consistent assessments. The pretest was not the same as the level test given by the course organizers. The inter-rater reliability was over 95% and the remaining cases were assigned into language proficiency levels through negotiation between the authors. The participants were all at the A1 to B1 level, as shown in Table 2. To make the results of the study comparable between groups, only the participants at the A2 level ($n = 52$) were selected for the study. These students formed the majority of all the participants (77.6%). One of the students from the Course I reciting group (Student IR1) was left out of the analysis since she wrote only one of the stories on the posttest. Altogether, 51 students were included in the analysis.

Table 2 Numbers of course participants in different groups at different language proficiency levels

Groups	Level		
	A1	A2	B1
Singing group I	7	4	0
Listening group I	1	9	0
Reciting group I	2	9	1
Singing group IIA	1	10	0
Listening group IIA	0	11	0
Reciting group IIA	0	9	3
Total ($n = 67$)	11	52	4

2.2. Teaching methods

The Finnish language and culture courses included 80 hours of teaching. Instruction in the course was based on a functional and communicative approach and included both language and culture classes. Instruction was organized as workshops: vocabulary and grammar, reading comprehension, and interaction. In addition, during the course, all the students participated in 7 teaching sessions related to this study. These sessions were spaced evenly throughout the course (see Appendix A). The sessions were 15 minutes each, altogether 105 minutes of the total of 80 hours of instruction. They were organized in the following way: Singing groups learned Finnish by singing, listening groups learned Finnish by listening to songs, and reciting groups learned Finnish by reciting the lyrics of the songs. The same songs were used in all the groups; the only difference between the groups was the teaching method. The authors taught these research-related sessions only, and they did not participate in the rest of the instruction offered in the course. The rest of the 80 hours of instruction included in the course was taught by three different teachers in each course, altogether six different teachers, who were each responsible for one workshop theme in each course.

The songs used in the teaching moments were Finnish children's songs (11) and pop songs (7). The information about the 18 songs which were used are included in Appendix B. The children's songs had easier lyrics and melodies, while the pop songs were more challenging. Both types of songs included similar vocabulary and grammar, and they were selected to suit the daily themes of the course, including nature, food, literature, and sauna. Often the children's songs were sung, listened to, or recited during two or more sessions. In the singing and reciting groups, some children's songs were combined with play or some gestures and movements (8 out of all the 11 children's songs) since embodiment is considered to enhance learning, as well as understanding and recall of the lyrics (see e.g., Coyle & Gomez Gracia, 2014; Lake, 2002, pp. 102-103). All the lyrics were given to the students as illustrated handouts (see an example in Appendix C) to facilitate understanding. In addition, the meaning of lyrics was discussed in all the groups.

In the singing groups, the authors taught children's songs to the students in the following manner: One author sang one verse of the song as a model, and then the other author repeated the verse together with the students. The whole song was first learned in this way, and, after this, the song was sung together a cappella or with a recording of the song. Often the children's songs were sung using gestures and movements typical for that song, and they were sung during two or more sessions. Recordings of the pop songs were always played, and they were listened to and sung at the same time. Often the pop songs were sung only once during the learning sessions. The meanings of all the songs were discussed either before or after singing them.

Listening groups listened to the same songs as the singing groups. Because in these groups the students did not practice singing or reciting songs, there was more time to listen to more songs than in the singing or reciting groups. Thus, the amount of input was the same in all the groups. While the songs were played, the participants actively listened to them and paid attention to the lyrics on the handouts. In this group, no gestures or movements were combined with listening.

The reciting groups recited the lyrics of the songs rhythmically. The lyrics were introduced to the participants by one of the authors reciting one verse of the lyrics at a time, after which the other author repeated it together with the students. Then, the whole song was recited together. A few songs were also recited in pairs expressing different moods. Gestures and movements related to the songs were used similarly to the singing groups. As in the other groups, the meanings of the songs were discussed before or after they were recited.

The singing groups' and the reciting groups' research-related activities differed from each other only in that the singing groups used melody in addition to rhythm. The listening groups differed the most from the other two groups since in this group the students' role was very passive, while the students in the

other groups were invited to actively participate in producing Finnish either by singing or reciting. The research-related songs were sung, recited or listened to only during the research-related sessions instructed by the authors. These sessions were independent from the rest of the course. Besides these research-related teaching sessions, the courses were the same for all the participants within their course level.

2.3. Data collection and analysis

The data was collected by a pretest and a posttest in which the students were asked to write stories based on two comic strips focusing on everyday situations. The pretest and posttest were identical. The first comic strip consisted of six pictures depicting a story about two birds, one of which flew out of a cage, and their owner, a young boy, looking for the lost bird. The other comic strip consisted of five pictures depicting a black cat that went to sleep on an armchair on which its owner sat down. These comic strips were designed for language learning and teaching by Schubi (1990). The comic strips used for the pretest and posttest were the same. The pretest was carried out on the first day of the course, and the posttest on the last day of the course. On both occasions, the participants had approximately 60 minutes to write the two texts.

In this study, written fluency was operationalized as the number of words used in a written text. We used quantitative analysis to examine the number of the words and the changes in them from the pretest to posttest. We carried out a repeated measures ANOVA test and calculated effect sizes for the different groups in order to investigate whether there was an interaction between written fluency—that is, the number of words produced in a limited amount of time—and the different teaching methods.

3. Development of written fluency in different groups

In this section, we examine 51 course participants at the A2 language proficiency level. First, we look at the development of written fluency in the different groups: the singing groups, the listening groups and the reciting groups. The six groups will be consolidated into three groups based on the teaching method used.

For all 51 participants, we examined written fluency by looking at the number of words produced on the pretest and posttest. On average, written fluency increased by 35% (min. -31%, max. 152%, $SD = 39\%$). As shown in Figure 1, in all the groups, written fluency increased on average. The numbers of actual words used on the pretest and posttest by individual participants are presented in Appendix D.

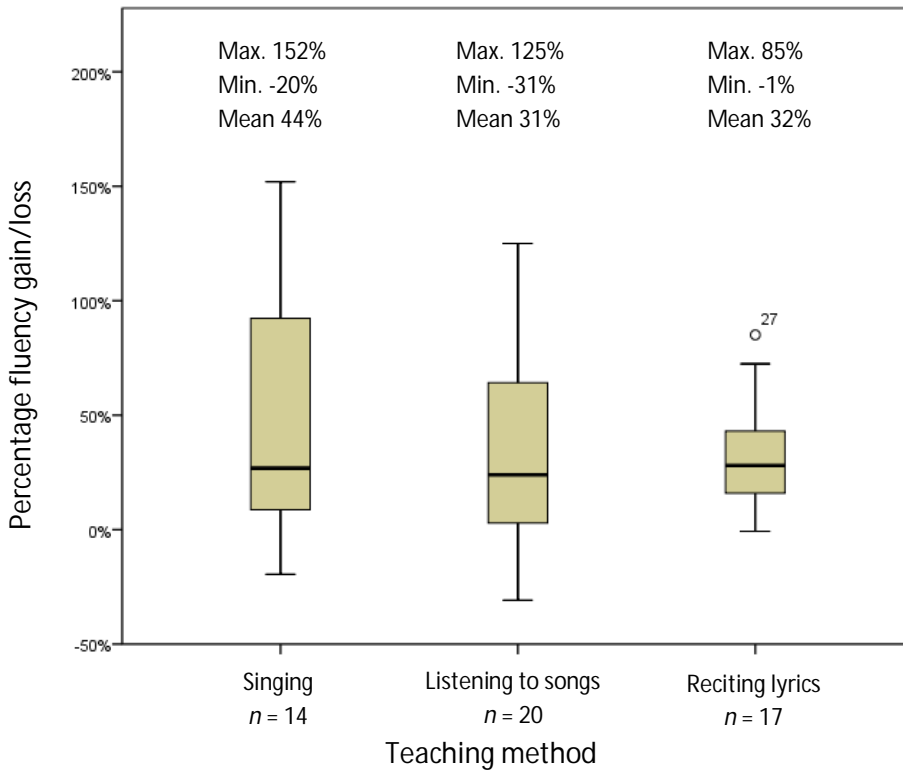


Figure 1 Percentage fluency gains/losses for the groups taught by different methods

Written fluency, examined as a number of words, increased the most in the singing group and the least in the listening group. A repeated measures ANOVA test was carried out to find out whether there was an interaction between the development of written fluency and different teaching methods. The interaction between the increase in fluency and the different teaching methods was not statistically significant ($F(2, 48) = .729$; $df = 2$; $p = .488$; eta squared = .027). However, there was a statistically significant difference in the fluency between the pretest and posttest ($F(2, 48) = 43.522$; $df = 2$; $p < .001$; eta squared = .465).

We also carried out post hoc tests to do multiple comparisons between the three different groups (singing, listening, and reciting). There was a statistically significant difference between the singing and reciting groups ($p = .014$; 95%CI = -55%, -5%), and between the listening and reciting groups ($p = .013$; 95%CI = -51%, -5%). There was no difference between the singing and listening groups ($p = .970$; 95%CI = -26%, 21%). Also, looking at effect sizes, there seemed to be a difference between the singing and reciting groups (Cohen's $d = .39$). The effect size was near medium, which suggests that the difference between these groups could have been statistically significant with a bigger sample size. The

effect sizes between the singing group and the listening group, and between the listening and the reciting group, however, were quite small, with Cohen's $d = .25$ and Cohen's $d = .15$, respectively. Moreover, the group numbers were quite small and somewhat unequal, so it is not possible to draw very strong conclusions based on the effect sizes.

In the singing group ($n = 14$), fluency increased on average by 44% (min. -20%, max. 152%, $SD = 51\%$), considerably more than in the other two groups. Even though fluency increased in this group on average, fluency decreased for two of the participants' written stories (by -20 % and by -10% respectively). The reciting group ($n = 17$) showed the second largest increase in written fluency, on average by 32% (min. -1%, max. 85%, $SD = 32.36\%$). All except one participant increased their written fluency from the pretest to the posttest. Participant IIR4's written fluency decreased by 1% between the tests. Also, one participant's (IR8) performance differed strongly from the rest of the group, as can be seen in Figure 1. Her fluency increased by 85.07%. The increase in written fluency was 29% on average for this group, if this deviant result is left out. However, the difference between the group mean and the mean excluding the deviant result is not great. In the listening group ($n = 20$), written fluency increased the least, on average by 31% (min. -31%, max. 125%, $SD = 25\%$). In this group, four students' fluency decreased, by -31%, -26%, -18% and -4%.

4. Discussion

Previous studies have shown that music has a positive effect on language learning (see e.g., Coyle & Gómez Gracia, 2014; Legg, 2009; Medina, 2000). In addition, rhythm has been found to be important for language learning (Purnell-Webb & Speelman, 2008; Stahl et al., 2011), although some studies have also shown that melody can enhance language learning more than rhythm (Ludke et al., 2014). In this study, our objective was to study whether singing enhances written fluency more than listening to songs or reciting song lyrics. Participants in this study were 51 students enrolled in two intensive Finnish courses organized by one Finnish university in cooperation with the Center of International Mobility (CIMO). The participants were selected from 67 students in the courses based on their level of language proficiency. The levels varied from A1 to B1, but since more than 75% of the students were at A2, these 51 students were chosen for the study.

We examined fluency by counting the number of words in a text and comparing pretest and posttest results, as is typical in second language acquisition research. We hypothesized that written fluency would increase the most in the singing group. We also hypothesized that written fluency would increase more in the reciting group than in the listening group.

Looking at descriptive statistics, on average, written fluency in the singing group increased by 44%, in the reciting group by 32%, and in the listening group 31%. Looking at the changes in the fluency, the singing group enhanced their performance the most. The listening group and the reciting group differed only narrowly in their performance.

Repeated measures ANOVA and post hoc tests were carried out to investigate the possible relationship between the teaching methods used and written fluency. In all the groups, fluency increased from the pretest to posttest statistically significantly, although there was no statistically significant interaction between fluency and the different teaching methods in the ANOVA. However, the post hoc tests showed that there was a statistically significant difference between the singing and the reciting groups, as well as between the listening and reciting groups. Also, looking at effect sizes, there seemed to be a considerable difference between the singing and reciting groups.

Even though there was a significant difference between the reciting and listening groups, looking at the means, the listening group and the reciting group did not seem to differ; in both groups, the increase in fluency was approximately 30%. This was not in accordance with our hypothesis: We expected the reciting group to perform better than the listening group since rhythm had a greater role in the reciting group. However, the post hoc tests revealed that there was a difference between these groups although it is not clear which teaching method has affected written fluency more. In some studies, rhythm has been shown to be more important for language learning than melody (Purnell-Webb & Speelman, 2008; Stahl et al., 2011).

In this study, there was also a statistically significant difference between the singing group and the reciting group. The groups' means seem to suggest that written fluency increased more in the singing group than in the reciting group, 44% and 32% respectively. This would suggest that singing has a stronger effect on written fluency. Comparing the singing group and listening group, there was no statistically significant difference between them even though the singing group increased their written fluency on average by a greater percentage, 44% compared to the 31% of the listening group. In the research literature, there is no consensus regarding the roles of rhythm and tone in second language learning; some have shown rhythm to be the most important factor for language learning (see e.g., Purnell-Webb & Speelman, 2008), while others have argued that tone has a greater effect (see e.g., Hébert & Peretz, 1997; Schön et al., 2008). However, some studies have shown that both rhythm and tone may support language learning and memory equally (Ludke et al., 2014).

In this study, written fluency increased in all the three groups at the group level. However, written fluency decreased in the posttest texts written by a few participants (1-4 people per group). In the singing group, written fluency decreased in

the texts of two participants. This may be explained by the fact that these participants' pretest stories were long to begin with. In addition, their posttest texts were structurally more complex, and more like narratives than descriptions, which resulted in denser texts. This would suggest a higher level of language proficiency and an increase in textual complexity, which would be an interesting research topic for the future. According to some researchers (Larsen-Freeman, 2006; Skehan, 2009), increases in complexity and accuracy often have a negative effect on fluency.

In the listening group, four participants' written fluency decreased. Reasons for this may be similar to those mentioned for the singing group. In addition, these participants' posttest stories were not as detailed as their pretest stories because they were more like narratives than descriptives. In the reciting group, one participant's written fluency did not change from the pretest to the posttest.

While drawing conclusions, it has to be taken into consideration that in two of the three groups (singing and reciting), gestures and play were used in addition to the tone and/or rhythm. In the listening groups no gestures or play were used. This is another factor besides the factors under investigation, and it may have affected the results of the study. The reason for not using gestures and play in the listening groups was that the participants were adults, and play and using gestures would not have been natural in the listening condition. Also, gestures and play were only used in 8 out of 18 songs used in the study, so the greater part of the input during the sessions was without gesture and play. It should also be noted that using the same task in the pretest and posttest, as we have chosen to do in this study, may also enhance fluency (see e.g., Larsen-Freeman, 2006, p. 595). However, even though the repeated use of the same task may have affected fluency in this study, the task was administered to all the three groups in a similar fashion, so the effects of using the same tasks in the pretest and posttest were the same for all the groups.

The study was carried out during two intensive Finnish language courses. Since the course schedules were very tight, the authors were not able to influence the assignment to the six different groups. The assignments to the three different teaching groups in Course I and Course IIA, six groups all together, were made by the course organizers based on a test measuring grammatical knowledge and passive language knowledge. Obviously, this was not ideal. Due to the variability of language proficiency levels in the six groups (A1-B1), we decided to focus on the participants at the A2 level. This seems appropriate, since over 75% of the participants were at this level. The proficiency levels were estimated by the two authors based on the written stories produced by the participants on the research-related pretest on the first day of the two courses. In the future, although classroom experiments are valuable and can shed light on language learning in authentic environments, it would be useful to study participant

groups in a more controlled manner. This way, sample size, language proficiency, and other factors could be controlled to a larger extent, which would increase the reliability of the study. Other researchers have studied the effect of singing on language learning with shorter duration of the instruction period (e.g., Ludke et al., 2014). However, in this study we wanted to do an intervention in the classroom in an actual course so that the results could be compared with and applied to actual classroom teaching. This was our attempt to ensure the ecological validity of the study.

5. Conclusions

According to our results, singing seems to be a good method for second language teaching, at least at the A2 proficiency level. We found statistically significant differences between the singing and reciting groups, as well as between the listening and reciting groups. The effect sizes point to there being a difference especially between the singing and the reciting groups. Also, the average increase in written fluency was the highest in the singing group compared to the other two groups.

With this study, our aim was to initiate a series of studies on the effects of singing on second language learning. Next, we will concentrate on other aspects of second language acquisition besides written fluency, for example pronunciation and spoken fluency, as well as accuracy and complexity both in writing and in speech. In this study, we have shown that there are some differences between the three teaching methods used in the study, and that there is some evidence that singing is the most effective method used in the study. However, further research with a greater number of participants and more controlled language proficiency level is needed in order to draw more exact conclusions on whether singing is a more effective teaching method than listening to songs or reciting song lyrics.

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APPENDIX A

The schedule for the research related singing, listening and reciting sessions, and the pre-test and posttest.

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Students arrive in Finland	Level test		Session 1	Session 2
Week 2	Session 3	Pretest	Session 4	Session 5	
Week 3			Session 6	Session 7	
Week 4		Posttest	Students leave		

APPENDIX B

The list of songs used in the study (C = children's song, MP = movement and play)

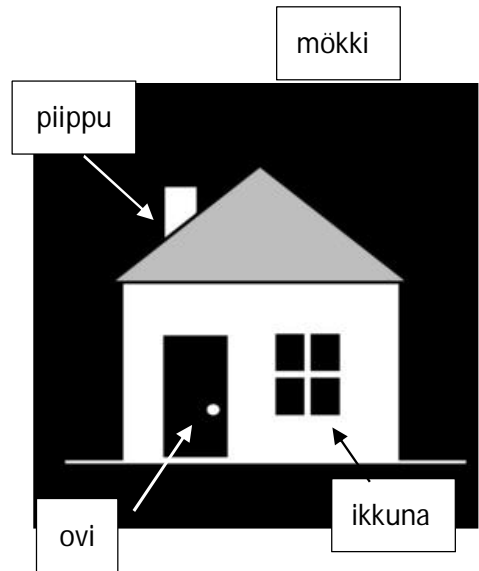
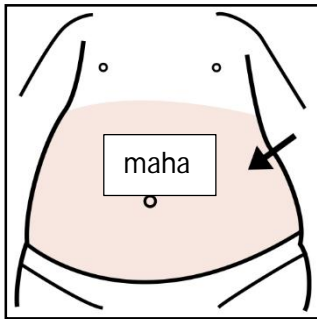
1. Aamulla herätys (C, MP), trad., Finnish lyrics by Liisa Tenkku
2. Bingo (C, MP), trad.
3. Leipuri Hiiva (C, MP), trad.
4. Löylyä lissää by Tapio Rautavaara, trad., lyrics by Reino W. Palmroth
5. Makkaralaulu (C, MP), trad.
6. Matkalaulu (C, MP), music & lyrics by Petter Ohls
7. Matkustaja by Egotrippi, music & lyrics by Knipi
8. Ostakaa makkaraa (C), trad.
9. Popsi, popsi porkkanaa (C, MP), music by Markku Kopisto, lyrics by Asta Kaukonen & Chrisse Johansson
10. Suosi suomalaista by Ultra Bra, music by Kerkko Koskinen, lyrics by Pekka Lahdenmäki
11. Tiitiäisen tuutulaulu (C), music by Risto Suurla, lyrics by Kirsi Kunnas
12. Tällaisena kesäyönä by Scandinavian Music Group, music by Joel Melasniemi, lyrics by Terhi Kokkonen
13. Täti Monika (C, MP), trad.
14. Ukko Nooa (C), trad., lyrics by C. M. Bellman
15. U-L-O-S by Puhuva kone
16. Vadelmavene by Kasmir, music & lyrics by Kasmir, Hank Solo, Jonas W. Karlsson, Mikko Kuoppala
17. Vihreän joen rannalla (kauan sitten), by Eppu Normaali, music by Pantse Syrjä, lyrics by Martti Syrjä
18. Ville ja Valle (C, MP), music by Eero Koivistoinen, lyrics by Kirsi Kunnas

APPENDIX C

Ville ja Valle

Ville ja Valle mökissänsä,
elivät olivat yksinensä.
Ovi oli lukossa, ja ikkunat oli tukossa
ja piipun päällä oli hattu.

Ville oli Ville ja Valle oli Valle,
senhän voi kuuluttaa kaikkialle!
Ville piti rahasta ja Valle piti mahasta,
varsinkin kun se oli täysi.



raha



hattu

Lyrics: Kirsi Kunnas
Music: Eero Koivistoinen
Pictures: Papunet <http://papunet.net/kuvatyokalu/fi>

APPENDIX D

The numbers of actual words on the pretest and posttest for individual participants and their gains/losses in numbers of words and percentages from the pretest to the posttest

Participant code	Number of words		Gain/loss from pretest to posttest	
	Pretest	Posttest	Number of words	Percentage
IS2	91	175	84	92.31 %
IS3	80	87	7	8.75 %
IS6	78	101	23	29.49 %
IS10	100	127	27	27.00 %
IIS1	77	194	117	151.95 %
IIS2	89	111	22	24.72 %
IIS3	159	128	-31	-19.50 %
IIS4	52	106	54	103.85 %
IIS7	48	104	56	116.67 %
IIS9	69	88	19	27.54 %
IIS10	109	138	29	26.61 %
IIS11	116	105	-11	-9.48 %
IL1	103	104	1	0.97 %
IL2	106	121	15	14.15 %
IL3	115	85	-30	-26.09 %
IL4	52	117	65	125.00 %
IL6	94	146	52	55.32 %
IL7	87	130	43	49.43 %
IL8	79	96	17	21.52 %
IL9	84	88	4	4.76 %
IL10	89	154	65	73.03 %
IIL1	89	155	66	74.16 %
IIL2	69	121	52	75.36 %
IIL3	115	94	-21	-18.26 %
IIL4	150	144	-6	-4.00 %
IIL5	74	129	55	74.32 %
IIL6	133	92	-41	-30.83 %
IIL7	85	115	30	35.29 %
IIL8	74	88	14	18.92 %
IIL10	90	122	32	35.56 %
IIL11	159	192	33	20.75 %
IIL12	87	110	23	26.44 %
IR2	118	191	73	61.86 %
IR4	118	145	27	22.88 %
IR7	174	300	126	72.41 %
IR8	67	124	57	85.07 %
IR9	157	182	25	15.92 %
IR10	109	126	17	15.60 %
IR11	107	137	30	28.04 %
IR12	88	106	18	20.45 %
IIR1	105	106	1	0.95 %
IIR2	150	153	3	2.00 %
IIR3	85	110	25	29.41 %
IIR4	137	136	-1	-0.73 %

IIR5	113	132	19	16.81 %
IIR7	72	103	31	43.06 %
IIR8	140	193	53	37.86 %
IIR11	93	148	55	59.14 %
IIR12	78	103	25	32.05 %

Note. I = Course I; II = Course IIA; S = singing teaching method; L = listening teaching method; R = reciting teaching method; the final number = individual participants within the six groups.