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Acknowledgment

“I would like to acknowledge the contributions of the following individuals to the development of my thesis:

Charlotta Plejert (PhD) and Richard Hirsch (Professor and PhD) who supervised my work and guided me through the organization of my research. I really appreciate their supportive comments and supervision. It was an honor for me to work with two well-known linguists in Sweden during my thesis work.

Monica Lopez, my Swedish teacher, who kindly offered her classroom for the purpose of this study and administrated class activities and posttests as well as all the students of her class who participated in this research as subjects.”
Introduction

“Music is an explosive expression of humanity. It's something we are all touched by. No matter what culture we're from, everyone loves music.”

- Billy Joel

By saying that, Billy Joel the American pianist, singer and song writer, refers to the universality of music, the aspect which everyone from all parts of the world, regardless of the culture they come from enjoy. Music goes beyond the words and notes on paper. Aristotle had this aspect of music in mind when he said: “Music imitates (represents) the passions or states of the soul, such as gentleness, anger, courage, temperance, and their opposites.”

 Apparently “music” has quite a significant effect on the learning process. This fact is observable when you see students studying while having their earphones on and listening to music. The rhythm and melody of music also facilitates memorization. A good and ancient example is the singing verbal map the Australian aboriginals inherited from their ancestors which they sing to remember the direction and frighten strangers away.

Similar to such an ancient technique, music acts as a link between the words of the lyrics like a chain. Due to such rhythm and melody, the remembrance of the rhythm and lyrics is much
easier. Plato was also aware of such fact when he described music as “the most effective instrument for education”.

What comes more to my attention is the impact of music on learning a new language. Personally I have enjoyed benefits of listening to English songs and music as a learner of English. There is enough research evidence supporting the advantages of using music as a didactic instrument. Generally speaking, music has an effect on our everyday life. Music changes our mood and makes our muscles move rhythmically. Human beings are not the only creature who enjoys the benefit of music. It is proven that cows lactate more milk and plants grow faster in the presence of music. In spite of my personal disagreement with some theories of Nietzsche, I quite agree with his famous saying that “without music, life would be a misunderstanding”.

**Aim of the study:**

This research aims at answering the following research questions:

- Does music improve the process of learning foreign language vocabulary?
- Does music have a positive or negative effect on short-term vocabulary learning?
- Does music have a positive or negative effect on long-term vocabulary learning?
- Does music facilitate learning different types of nouns, adjectives, etc more than other types?

The focus of the research is on the effects of music on short-term vocabulary learning. Therefore these questions give rise to the following hypotheses:

\[ H_0 = \text{null hypothesis: music has no effect on vocabulary learning in the short-term.} \]

\[ H_1 = \text{positive, directional hypothesis: music positively effects the process of vocabulary learning of a foreign language in the short-term.} \]

\[ H_1 = \text{negative, directional hypothesis: music negatively effects the process of vocabulary learning of a foreign language in the short-term.} \]

\[ H_1 = \text{alternative hypothesis, no direction: music causes some effects on this process but the direction of the difference is not specified.} \]

The design of this research is portrayed in the methodology chapter.
**Limitations of the study:**

The short period of time was the most challenging impediment that I as a researcher struggled with. In fact conducting research in a period of less than three months and gathering reliable and convincing results seems impossible. As mentioned earlier, the aim of this research was to examine the vocabulary learning process both in the short term and long term. However, due to lack of time, it was decided to focus on the effect of music on short-term learning of foreign language vocabulary while the long-term process was left for further research.

Insufficient sessions of instruction and limited number of subjects were among other barriers caused by the time shortage.

In order to gather reliable results, the subjects should have been divided into homogenous study groups and this could have been obtained through having a pre-test to examine for such homogeneity. Despite this rule of thumb, such a pre-test was not possible in the procedure of this research which may have caused problems in the data analysis.

To get more knowledge on the issue of this research, let’s have a brief review of previous related literature in the following section.
Proving the didactic usage of music is not a hard thing to do. The history of language learning methodology is replete with theoretical and research support for such a claim. Krashen’s theory of second language acquisition seems the most applicable here.

**Acquisition-Learning Hypothesis**

In his Acquisition-Learning hypothesis, Krashen distinguishes between acquiring and learning a second language by describing the former as a subconscious process quite similar to the acquisition of the first language by children derived from communication and interaction and the latter as a conscious process resulting from conscious acquaintance with the rules and instruction in the target language (Krashen 1988). According to him: “Language acquisition does not require extensive use of conscious grammatical rules, and does not require tedious drill. Acquisition requires meaningful interaction in the target language - natural communication - in which speakers are concerned not with the form of their utterances but with the messages they are conveying and understanding”. He also describes the best language learning method as: “those that supply 'comprehensible input' in low anxiety situations, containing messages that students really want to hear” (Krashen 1988). This hypothesis highlights two important features of a successful learning: unconscious input and a low anxiety situation. This is quite similar to what music brings about. The input which is learned through listing to a piece of music can be regarded as ‘acquisition’ since the learner unconsciously obtains the new input e.g. new vocabulary.
Affective Filter

As learners, we all have experienced the feelings of anxiety and fear and uneasiness which can negatively affect the learning process. The Affective Filter is another hypothesis suggested by Krashen. He claims affective variables such as a high degree of motivation and self-confidence and a low level of anxiety facilitate the learning process of the language learners (Krashen, 1988).

The emotional state of the learner acts as a filter. When there is high motivation among students, the learning process takes place in the best way. The use of music can improve the emotional state and facilitate the learning process.

Music can create a calm and anxiety-free environment for the learners. Thomas A. Claerr and Richard Gargan [Claerr & Gargan 1984] study the practical application of songs and music in the foreign language classroom and suggest some ways for creating such a learning environment to the teachers. They argue that the songs are a reflection of the society that the language is spoken in. The songs are about social issues or historical events and can be used by teachers for appropriate occasions and situations [ibid, p4].

The “affective domain” of songs and the pleasure and fun that music brings to the classroom is the most beneficial and at the same time the least understood feature of the use of songs in pedagogy. Songs and music can add excitement to the learning environment and attract less interested students [ibid, p5].

Similar to Krashen’s description of the best language learning method, they assert that “the best learning occurs in a state of reduced conscious awareness or indirect attention” and that music can create such a situation [ibid, p6].

To portray such a friendly and anxiety-free learning setting, it is worth mentioning the experiment conducted by Robert Lake, an English teacher, which he refers to as his favourite day of teaching. While Robert was teaching a beginning level class of ESL students from Bosnia, he organized a ‘Cultural exchange day in music’ in order to warm up the atmosphere of the classroom which was made of Muslims and Croatians. He asked students to play their folk songs and sing along. Consequently, as he puts it, students pushed the desks and chairs back and started
to sing and dance together in small circles while holding hands. “The walls came down between Muslim and Serbs as well as the Balkans and the United States” he says. “The atmosphere in my class became much more relaxed after that Friday” [Lake 2003, p99].

The Input (plus-one) Hypothesis

Krashen asserts that progression and development in language learning occurs in a 'natural order' when the learner receives second language 'input' that is one step beyond his/her current stage of linguistic competence. In other words acquisition takes place when the learner receives the data close to his or her current level of understanding but a little higher (i+1) (Krashen, 1988).

Lake further explains that in this model ‘plus one’ means the new input and states that learning occurs best when there is something more than the current knowledge of the learner [Lake 2003, p103]. He states that the chorus of the song functions as ‘plus one’ compared to the verses. “Students will pick up the chorus much sooner than the verses of a song. The chorus is the plus-one feature of many parts of the verses” [ibid, p104].

In teaching new vocabulary, for example, the songs can be hierarchically ordered based on the burden of new vocabulary they contain and can be practiced from the lowest level of difficulty to the highest. For practicing different verb tenses, which seems most confusing for the beginning learners, the chosen songs can be ordered according to the verb tense of their lyrics e.g. from simple present to more complex structures. In this fashion, i-plus-one model is taken into consideration.

The Natural Order Hypothesis

The ‘natural order theory’ suggests that acquisition of a language follows a natural sequence which can be predicted. Krashen believes some grammatical structures can be acquired earlier than some others regardless of a learner’s age or language background (Krashen, 1988). It can be utilized in choosing songs for a language learning classroom. The songs can be categorized based on the competence level of the learners. This categorization is comparable to the i-plus-one theory in which the input is hierarchically classified from simple to difficult.
Therefore in choosing the appropriate music, these factors should be considered. First, the difficulty of the song should match the knowledge of the class. Second, the grammatical input that the song includes should be suitable for the learner. The third aspect is concerned with the vocalist’s diction which should be clear to the foreign language learners. And the last criterion is concerned with the genre which is better if it is the learner’s favourite. Taking such criteria into consideration improves the learning process to a great extent.

**Music and the Brain**

In his theory of Multiple Intelligence, Howard Gardner, the American developmental psychologist, hypothesized that different learners employ different methods of learning based on their intelligences and capacities. They utilize the method which best suits their learning process (Gardner, 1983).

Learners have different methods of learning and unconsciously establishing their most appropriate learning method. Some students are visual learners; they prefer to receive the input in diagrams, pictures, etc. Others like to use their hearing and to receive listening materials while others prefer to be more involved in action and to do physical activities like singing, role playing or drama (Mora 1999, p 146).

Moreover, the different hemispheres of the brain represent different learning styles and each learner has a different learning style. According to Brown (1994), the dominance of each side in human’s brain differs from culture to culture. The language learners who use right brain are more emotional and use more metaphors and imagination while the left-brain group are more language oriented using language for thinking and recalling. The significance of music is pointed out here since it combines emotion and language and bridges the two hemispheres [Lake 2003, p 106].

The song-stuck-in-my-head (SSIMH) phenomenon or Din is another paradigm of the correlation between the brain and music. Technically speaking, Din is defined as “involuntary rehearsal of a foreign language in one’s mind” (Murphy 1990, p 1). We frequently experience such phenomena in daily life. It happens when a rhythm or melody of a piece of music echoes in one’s head and one unconsciously repeats it in one’s own mind. But how can Din enhance language acquisition?
Krashen claims: “The Din is set off by comprehensible input. This input needs to contain significant quantities of the acquirer’s i + 1, structures which the acquirer has not yet acquired but is ready for” (Murphy 1990, p 1). This way, the plus-one materials e.g. new vocabulary, grammatical point, etc which are learnt through music can be recalled much easier, thanks to the chain memorization caused by the SSIMH phenomenon.

Tim Murphy has conducted a pilot research on 49 subjects in which most of them were native speakers of English and almost all of the subjects experienced the song-stick-in-my-head (SSIMH) phenomena. Therefore he concluded that: “It would seem that the SSIMH experience is common to many people” [Murphy 1990, p7].

Here the important question is how long a song takes to be stuck in one’s head. Krashen answers this question by saying that: “The Din takes a certain time to start up... at least one or two hours of good input” (Murphy 1990, p 1). We will come back to this hypothesis later in the discussion chapter.

Bobby McFerrin, the American vocalist and musician, demonstrated another magical characteristic of music in his live experiment on the audience at the World Science Festival 2009. In this experiment, he simply made an imaginary keyboard out of the stage and started to jump on a certain spot while making the tone of that key with his mouth and asking the audience to sing that particular tone with him. He also produced the neighbouring sounds to that particular tone in a pentatonic scale. Amazingly, the audience produced the correct and on-tone sound of that imaginary key which he had not introduced before. More interestingly, the audience correctly sang the tones of every key that Bobby symbolically pressed with his feet in the pentatonic scale. Having successfully conducted the experiment, he commented that he had tried such a test in different parts of the world and all the audiences could accurately produce the sound of the intended tone, regardless of the culture or race they came from [McFerrin, 2009]. The pedagogical implication of that festival was to indicate the relationship between tones of music and neurons of the human’s brain. It can be concluded that there is a universal melody and rhythm located in the brain and based on such a connection, human beings can expect or recall the tonal and rhythmic pattern of a piece of music.

How can music help?
It is hypothetically and practically proven that music improves listening skills since it is directly in connection with the sense of audition. The realm of language learning methodology is abundant with scientific support for this claim. It is also interesting to know music helps the improvement of other language skills.

Kristin Lems, an ESL teacher and musician, believes the influence of music is borderless and that music can positively affect a variety of language abilities. She asserts that singing a piece of music can improve pronunciation and oral skills by helping learners overcome their difficulties in English pronunciation which stem from their dissimilar alphabetical and pronunciation backgrounds (Lems 2005, p 17).

It is more interesting to mention that she innovatively claims positive effects of music on writing skills. She supports her claim with reference to Krashen’s ‘theory of affective filter’ suggesting that listening to music while writing reduces anxiety and fear of writing errors. Therefore learners are enabled to write freely about a topic without the fear of mistakes or misspelling (Lems 2005, p 17). She also reports that progress in vocabulary memorization and reading comprehension are among other beneficial factors of utilizing music in the ESL classroom, e.g. through reading and memorizing the lyrics of a song (Lems 2005, p 19).

She states that music also brings non-linguistics benefits. Music carries the cultural and historical background of the target language and also the cultural and historical backgrounds of the students into the classroom and makes a cultural environment creating friendships among students. She believes: “When you share lyrics with immigrant students a third dimension is added: cultural themes. American songs are a rich source of contemporary idioms and culture, and in fact many concepts and traditions have entered American culture through the medium of song” (Lems 2005, pp 19-20).

Considering all the above mentioned literature, it is concluded that music can be a useful part of any second/foreign language curriculum. Teachers can use songs in many different ways. Teachers can ask students to talk about their favourite music styles, musicians, songs and ask them to sing them or they can create karaoke activities or ask the students to sing along with the singer while looking at the lyrics.
More research and investigation is required to make music an inseparable part of language classrooms. The experimental research on music and second language learning done so far is limited and even more limited with a focus on adults. Since there are no adult ESL programs that put music in the center, it is hard to find research showing the power of music as a teaching tool (Lems, 2005). Although there are many articles on the benefits of using music in language learning classrooms, very few suggestions have been made on how to carry out such activities.

In sum, the role of music and its benefits to both language learners and instructors is undeniable. Although music does not seem to be the ultimate cure-all for language learning barriers, colloquially speaking, Music Rocks!
Method

Subjects

The subjects of this study were chosen from learners of Swedish as a foreign language. An intermediate Swedish class of 16 international students at Linköping University of Sweden was randomly selected among six Swedish classes at the same level. The teaching curriculum of all those six classes were the same and supposedly the students possessed approximately an equal knowledge of the Swedish language since they had participated in at least 10 sessions of instruction during the spring semester 2010 at level B. The 16 subjects from the chosen class were divided into two groups in a random manner i.e. assigning 1 or 2 numbers to each subject and grouping into groups 1 and 2. Group 1 and group 2 were entitled Experimental Group and Control Group respectively.

Such random selection of subjects, known as post-test only control group, was implemented to compensate for the absence of pre-test and to control the probable initial differences among the subjects (Farhadi & Hatch, 2002, p. 22).

Sex, nationality, mother tongue, age and education were not taken into account in the selection procedure. The 16 subjects represent nine different ethnical and language backgrounds, most of them within a range of 20-30 years old. The number of subjects, their nationality, age, and mother tongue are presented in figure 1, and tables 1, and 2 below.
The ethnical background of the subjects in both the experimental and control group are summarized in tables below:

### Table 1 - ethnical background of the experimental group

<table>
<thead>
<tr>
<th>gender</th>
<th>age</th>
<th>nationality</th>
<th>mother lang</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>M</td>
<td>26</td>
<td>Pakistani</td>
</tr>
<tr>
<td>E2</td>
<td>M</td>
<td>23</td>
<td>Spanish</td>
</tr>
<tr>
<td>E3</td>
<td>M</td>
<td>22</td>
<td>French</td>
</tr>
<tr>
<td>E4</td>
<td>M</td>
<td>24</td>
<td>Iranian</td>
</tr>
<tr>
<td>E5</td>
<td>M</td>
<td>28</td>
<td>Hellenic</td>
</tr>
<tr>
<td>E6</td>
<td>M</td>
<td>26</td>
<td>Bangladeshi</td>
</tr>
<tr>
<td>E7</td>
<td>M</td>
<td>24</td>
<td>German</td>
</tr>
<tr>
<td>E8</td>
<td>F</td>
<td>23</td>
<td>Chinese</td>
</tr>
</tbody>
</table>

### Table 2 - ethnical background of the control group

<table>
<thead>
<tr>
<th>gender</th>
<th>age</th>
<th>nationality</th>
<th>mother lang</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>F</td>
<td>27</td>
<td>Chinese</td>
</tr>
<tr>
<td>C2</td>
<td>M</td>
<td>37</td>
<td>Pakistani</td>
</tr>
<tr>
<td>C3</td>
<td>M</td>
<td>29</td>
<td>Iranian</td>
</tr>
<tr>
<td>C4</td>
<td>M</td>
<td>24</td>
<td>French</td>
</tr>
<tr>
<td>C5</td>
<td>F</td>
<td>23</td>
<td>Chinese</td>
</tr>
<tr>
<td>C6</td>
<td>F</td>
<td>25</td>
<td>Iranian</td>
</tr>
<tr>
<td>C7</td>
<td>F</td>
<td>28</td>
<td>Kenyan</td>
</tr>
<tr>
<td>C8</td>
<td>F</td>
<td>21</td>
<td>French</td>
</tr>
</tbody>
</table>
Materials and Procedure

Having divided the subjects into two groups, the research began. The material chosen for this study was a popular Swedish song named *Sång Till Friheten (song of freedom)* by *Björn Afzelius*, 1990 (the YouTube link is available in the reference list). The lyrics of this song were provided to both groups along with its translation in different columns, while 15 key words out of a total of 81 words of the lyrics were underlined in order to put more emphasis on the key words.

In the selection of key words, different factors were taken into account. Grammatical rules equivalent to the previous instructions of the class such as adjectives versus superlative adjectives, positive versus negative and abstract versus concrete nouns were among those factors. The contrast between the key words is described below. A sample of the class activity is also attached to the appendix.

<table>
<thead>
<tr>
<th>adjective</th>
<th>superlative form</th>
</tr>
</thead>
<tbody>
<tr>
<td>dyr</td>
<td>det dyraste</td>
</tr>
<tr>
<td>fin</td>
<td>det finaste</td>
</tr>
</tbody>
</table>

**positive**  
**negative**

rättvisan  
orättvisan

**abstract nouns:**
tro, kärlek, friheten, vänskapen, rättvisan, freden, framtiden, dröm

**concrete nouns:**

stjärnorna, vindarna, vågorna, fåglarna, blommorna, ögon

As mentioned in the second chapter of this study, according to the theory of the ‘Multiple Intelligence’, each learner has his or her own method of learning (Gardner 1983). In other words, some learners acquire tangible and concrete objects easier than those who think more conceptually and absorb abstract data much easier. Therefore both concrete and abstract types of
nouns were included in the testing material to see whether music facilitates the learning process of one type of noun more than the other, or not.

The ‘post-test only control group’ design was chosen for this research:

\[ G_{1}^{(\text{random})} \times T_{1} \]

\[ G_{2}^{(\text{random})} \ 0 \ T_{1} \]

X symbolizes the treatment that the experimental group received and zero (0) stands for the placebo or no-treatment for the control group. T stands for the post-test which the two groups received.

The difference between the two groups’ activities was the song (music) to which the experimental group listened during the research as treatment while the control group focused merely on the text and its translation. The aim was to measure the degree of effectiveness of music as a variable in the learning process of new vocabularies.

The procedure of the research started when the experimental group briefly skimmed the text for one minute in order to catch up with the tempo of the music and then the subjects listened to the song twice. The song was 3 minutes long.

In a separate room, the control group had 4 minutes to read the text and learn the underlined vocabularies by heart.

Having conducted the class activities, the post-test was administrated to both groups. The post-test consisted of the song’s lyrics without the underlined key words where the subjects had to fill in the blanks by choosing the correct words from a word list. Three extra words were added to the word list in order to reduce the probability of wild guesses. The English equivalent of the omitted key words was also provided in parentheses following the blank spaces to help the subjects recall the missing words. Students had four minutes to do the post-test. A sample of the post-test is also attached to the Appendix.

**Data Analysis**
The individual achievement of each subject was assessed on the basis of the score they achieved out of the correct answers to the 15 blank spaces of the post-test. Each correct answer equalled one point. Therefore the total score ranged from 0 to 15 or 0% to 100%. The overall achievement of each group was measured through the individual achievement of the subjects of that particular group. An in-depth analysis of the data gathered from this research is presented in the results section.

**Prospect and Consequences of the Method**

Despite the random selection of the subjects, there still is room for error. Neglecting the pre-test to measure the homogeneity of the two groups is a great risk which can lead to a false or unreliable outcome, although even with a pre-test it is hard to definitely claim the homogeneity of the groups since other external factors such as anxiety or other affective filters influence the result of each individual. However, due to the time restriction, administration of the pre-test was considered impossible for this research.

Here, the key factor of this research was the Din which facilitates acquisition and memorization of new vocabularies. The short practice sessions however prevented the occurrence of Din since a certain amount of exposition to musical input is required, e.g. two or three hours of good input, as Krashen puts it. Such shortcomings in the implemented procedure were expected to degrade the validity of the result.
Results

After following the class activity procedure, each group’s achievement was determined through the post-test. The scores of the experimental and the control group on the post-test are presented in the tables below:

<table>
<thead>
<tr>
<th>subject</th>
<th>score</th>
<th>percent</th>
<th>gender</th>
<th>age</th>
<th>nationality</th>
<th>mother lang</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>5</td>
<td>33%</td>
<td>M</td>
<td>26</td>
<td>Pakistani</td>
<td>Urdu</td>
</tr>
<tr>
<td>E2</td>
<td>7</td>
<td>46%</td>
<td>M</td>
<td>23</td>
<td>Spanish</td>
<td>Spanish</td>
</tr>
<tr>
<td>E3</td>
<td>7</td>
<td>46%</td>
<td>M</td>
<td>22</td>
<td>French</td>
<td>French</td>
</tr>
<tr>
<td>E4</td>
<td>15</td>
<td>100%</td>
<td>M</td>
<td>24</td>
<td>Iranian</td>
<td>Persian</td>
</tr>
<tr>
<td>E5</td>
<td>15</td>
<td>100%</td>
<td>M</td>
<td>28</td>
<td>Hellenic</td>
<td>Greek</td>
</tr>
<tr>
<td>E6</td>
<td>15</td>
<td>100%</td>
<td>M</td>
<td>26</td>
<td>Bangeladeshi</td>
<td>Bengali</td>
</tr>
<tr>
<td>E7</td>
<td>15</td>
<td>100%</td>
<td>M</td>
<td>24</td>
<td>German</td>
<td>German</td>
</tr>
<tr>
<td>E8</td>
<td>15</td>
<td>100%</td>
<td>F</td>
<td>23</td>
<td>Chinese</td>
<td>Chinese</td>
</tr>
</tbody>
</table>

Table 3 - Experimental group’s score
<table>
<thead>
<tr>
<th>subject</th>
<th>score</th>
<th>percent</th>
<th>gender</th>
<th>age</th>
<th>nationality</th>
<th>mother lang</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>9</td>
<td>60%</td>
<td>M</td>
<td>37</td>
<td>Pakistani</td>
<td>Urdu</td>
</tr>
<tr>
<td>C2</td>
<td>10</td>
<td>66%</td>
<td>F</td>
<td>27</td>
<td>Chinese</td>
<td>Chinese</td>
</tr>
<tr>
<td>C3</td>
<td>13</td>
<td>86%</td>
<td>M</td>
<td>29</td>
<td>Iranian</td>
<td>Persian</td>
</tr>
<tr>
<td>C4</td>
<td>14</td>
<td>93%</td>
<td>M</td>
<td>24</td>
<td>French</td>
<td>French</td>
</tr>
<tr>
<td>C5</td>
<td>15</td>
<td>100%</td>
<td>F</td>
<td>23</td>
<td>Chinese</td>
<td>Chinese</td>
</tr>
<tr>
<td>C6</td>
<td>15</td>
<td>100%</td>
<td>F</td>
<td>25</td>
<td>Iranian</td>
<td>Persian</td>
</tr>
<tr>
<td>C7</td>
<td>15</td>
<td>100%</td>
<td>F</td>
<td>28</td>
<td>Kenyan</td>
<td>Sawahili</td>
</tr>
<tr>
<td>C8</td>
<td>15</td>
<td>100%</td>
<td>F</td>
<td>21</td>
<td>French</td>
<td>French</td>
</tr>
</tbody>
</table>

Table 4 - Control group’s score

The first column of the table presents the label assigned to each participant of each group (e.g. E1 represents a subject of the experimental group and C1 represents one from the control group). It is worth mentioning that the subjects are ordered on a hierarchical basis from the lowest score to the highest. The score column shows the raw scores gained by each subject out of 15 (total number of blank spaces of the post-test), followed by the percentage of the score. The ethnical background of each subject is provided in the subsequent columns for further assessment.

**Experimental Vs Control Group**

Comparing the two tables it can be concluded that the subjects of the control group who did not receive treatment out-performed the subjects of the experimental group although the difference is slight. The possible causes of the outcome are presented in the discussion section.

Figure 2 illustrates the distribution of total 16 scores. The scores are divided into 5 sets.

![Figure 2 - distribution of the total score sets](image)

The vertical axis represents the number of scores and the horizontal one represents the score sets.
To facilitate the comparison of each group’s achievement, the scores are shown in separate columns in the Figure 3.

![Figure 3 - frequency distribution of the experimental and control group respectively](image)

Figure 4 also demonstrates the individual achievement percentage of the subjects of each group.

![Figure 4 - individual score](image)

In order to assess the efficiency of a test, it is important to measure the variability of the scores. An efficient test is one which discriminates between good, average and weak students. The scores achieved by a group of subjects must be spread evenly on a distribution graph, like a normal (bell-shaped) curve. If we take the vertical axis as the frequency of the scores and the horizontal one as the scores, it can be interpreted from a normal distribution that a few subjects scored low and a few subjects scored high on the test while most of the students scored on an average level. It means that the test discriminated between the subjects.
The measurement of variability is necessary to describe the distribution of the scores achieved by each group. The greater the difference between the scores, the more spread the scores are in a distribution and the distribution graph follows the characteristics of a normal curve distribution graph (Farhadi & Hatch, 2002).

The variability of each group is measured separately. The mean score for the experimental group is 11.75 and for the control group 13.25.

The deviation of each score from the mean is presented for the experimental and the control group in the tables below:

<table>
<thead>
<tr>
<th>subject</th>
<th>score</th>
<th>percent</th>
<th>x-mean</th>
<th>xm^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>5</td>
<td>33%</td>
<td>-6.75</td>
<td>45.5625</td>
</tr>
<tr>
<td>E2</td>
<td>7</td>
<td>46%</td>
<td>-4.75</td>
<td>22.5625</td>
</tr>
<tr>
<td>E3</td>
<td>7</td>
<td>46%</td>
<td>-4.75</td>
<td>22.5625</td>
</tr>
<tr>
<td>E4</td>
<td>15</td>
<td>100%</td>
<td>3.25</td>
<td>10.5625</td>
</tr>
<tr>
<td>E5</td>
<td>15</td>
<td>100%</td>
<td>3.25</td>
<td>10.5625</td>
</tr>
<tr>
<td>E6</td>
<td>15</td>
<td>100%</td>
<td>3.25</td>
<td>10.5625</td>
</tr>
<tr>
<td>E7</td>
<td>15</td>
<td>100%</td>
<td>3.25</td>
<td>10.5625</td>
</tr>
<tr>
<td>E8</td>
<td>15</td>
<td>100%</td>
<td>3.25</td>
<td>10.5625</td>
</tr>
</tbody>
</table>

Table 5 – deviation of the experimental group
Table 6 - deviation of the control group

<table>
<thead>
<tr>
<th>subject</th>
<th>score</th>
<th>percent</th>
<th>x-mean</th>
<th>xm^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>9</td>
<td>60%</td>
<td>-4.25</td>
<td>18.0625</td>
</tr>
<tr>
<td>C2</td>
<td>10</td>
<td>66%</td>
<td>-3.25</td>
<td>10.5625</td>
</tr>
<tr>
<td>C3</td>
<td>13</td>
<td>86%</td>
<td>-0.25</td>
<td>0.0625</td>
</tr>
<tr>
<td>C4</td>
<td>14</td>
<td>93%</td>
<td>0.75</td>
<td>0.5625</td>
</tr>
<tr>
<td>C5</td>
<td>15</td>
<td>100%</td>
<td>1.75</td>
<td>3.0625</td>
</tr>
<tr>
<td>C6</td>
<td>15</td>
<td>100%</td>
<td>1.75</td>
<td>3.0625</td>
</tr>
<tr>
<td>C7</td>
<td>15</td>
<td>100%</td>
<td>1.75</td>
<td>3.0625</td>
</tr>
<tr>
<td>C8</td>
<td>15</td>
<td>100%</td>
<td>1.75</td>
<td>3.0625</td>
</tr>
</tbody>
</table>

The ‘x-mean’ column shows the difference of each single score with the mean score of the group to which the subject belongs and the following column shows the square of that divergence which is used to calculate the standard deviation.

Standard deviation is one of the most commonly used measures of variability of scores in a distribution since it is not sensitive to the lowest and highest scores and it takes all the scores in a distribution into account. The greater the value of standard deviation of scores is, the more scattered and evenly spread scores are and, consequently, the more reliable the test result is. The standard deviation of each group is measured according to the formula:

$$\text{Standard deviation} = \sqrt{\frac{\sum (X - \bar{X})^2}{N - 1}}$$

In this case, the standard deviation of each group turned out to be 4.52 for the experimental and 2.42 for the control group.

The variability of the experimental group (4.52) is noticeably higher than that of the control (2.42). In other words, the scores of the control group are closer to the mean score and less deviated than the scores of the experimental group.

As we can see in the deviation graphs below, the post-test was more efficient for the experimental group since there are relatively equal amount of scores both beneath and above the mean score which means subjects has been discriminated pretty well while most scores of the control group are in a range close to the mean score (0 axis) and the scores are less distributed.

The deviation of each score from the mean score is presented in the following figures.
In these two figures, the horizontal axis (0 axis) determines the mean score of the group and the diagram illustrates the positive and negative deviation of each subject (i.e. S1 to S8) from the mean.

**Concrete vs. Abstract**

Another finding of the research which is worth mentioning is the performance of the subjects of each group toward abstract vs. concrete nouns and the superlative adjective form. These differences are shown in table 7 and figure 7.
According to these data, it can be concluded that the experimental group which received music as a treatment during the class activity scored considerably lower than the subjects of the control group regarding the abstract nouns (e.g. kärlek, tro, friheten, vänskapen, rättvisan, freden, framtiden) while the two groups’ score on concrete nouns and superlative adjectives are equal or only slightly different. In this case the music negatively affected the memorization of the abstract nouns. These data will help us determine the probability and hypothesis testing which is dealt with in the discussion section.
Discussion and Conclusion

Hypothesis Testing

Considering the data analysis, we can now test our hypotheses. As mentioned earlier, the possible hypotheses are:

- **$H_0$**: null hypothesis: music has no effect on vocabulary learning in the short-term.
- **$H_1$**: positive, directional hypothesis: there is a difference between the sample and the population; the sample subjects will learn vocabulary better in the short-term with music.
- **$H_1$**: negative, directional hypothesis: there is a difference; the sample will not learn vocabulary in the short-term with music as well as the population.
- **$H_1$**: alternative hypothesis, no direction: there is a difference but the direction of the difference is not specified.

Here the sample is regarded as our experimental group and the population as the control group. With the presupposition that our two groups are homogeneous due to the random selection of subjects, the null hypothesis is consequently rejected since the two groups did not score the same and the difference must be derived from an external factor, i.e. the treatment. Therefore one of the alternative hypotheses must be the case.

By evaluating the data analysis presented in the results section, it can be concluded that implementation of the proposed procedure and treatment not only did not enhance the vocabulary learning process in the short-term, but instead it slightly downgraded this process. In
this fashion, the negative, directional hypothesis which proposes that music negatively affected the short-term learning process of the sample (experimental group) seems most suitable for the finding of this research.

It is worth discussing the validity of the findings of this pilot research considering the limitations mentioned in the first section. *Test effect* of the control group’s class activity can be a possible factor which puts the internal validity of the research into question. Apart from the possibility of the heterogeneity of two groups, the outperformance of the control group over the experimental group can be achieved by the class activity (placebo) which the control group received. In other words, here the placebo (memorization) can be more effective in short-term learning process of vocabularies than using music as a means to facilitate the learning process. It does not necessarily mean the music had a negative effect.

Several other factors can also be named to justify this result. The most probable explanation could be the heterogeneous nature of two groups. Although the subjects were selected and grouped completely in a random manner in order, even with random selection of subjects, there is always room for error (Farhadi & Hatch, 2002, p. 80). The absence of a pre-test to examine the pre-existing differences between the two groups is another decisive factor.

As we can see in Figure 2 of the previous chapter, the diagram of the score distribution is negatively skewed since most of the subjects scored high. It can be interpreted that the test was so easy that it failed to discriminate between the subjects and the groups. This asymmetric distribution is also problematic for hypothesis testing since the scores are not normally distributed. It also lacks the characteristics of a normal distribution because the mean, median and mode are not the same (11.75, 15, 15 for the experimental group and 13.25, 14.5, 15 for the control group) and consequently the shape of the diagram is not bell-shaped and symmetric like a normal curve (Farhadi & Hatch, 2002, p. 64).

The probable reason why the scores were not distributed normally can be attributed to the insufficient number of subjects. Theoretically, the number of subjects should be 30 or more in order to achieve a normal distribution and with subjects less than that, it is hardly possible to have such normal distribution, although normal distribution is only an idealized mathematical
concept and does not exist in reality (Farhadi & Hatch, 2002, p. 64). Thus it seems unlikely for a sample of 16 randomly selected subjects to follow the principle of normal distribution.

While talking to the subjects of the experimental group after the post-test, a few of them mentioned the lengthiness of the chosen song (treatment) as a cause of their low performance on the post-test. The length of the treatment is an intervening variable which negatively affected the performance of the subjects received by the experimental group, i.e., it caused frustration or weariness. Lems was also aware of such a complication when she claims: “making [adult] students sing [in the classroom] remains the concern of so many teachers (Lems 2005, p 17).

It can also be claimed that the music may have disturbed the concentration of the experimental group because they score noticeably lower than the control group concerning the concrete nouns. Interestingly, the two groups scored almost equally concerning abstract nouns and superlative adjectives (Table 7).

The class activity and the post-test consisted of a Swedish text for none-Swedish speakers with various mother language backgrounds and the English translation of the text was used as a mediator between their mother tongue and the Swedish text. The process of converting Swedish to English to Mother tongue is time consuming and it can be difficult for the subjects of the experimental group to synchronize this process with the tempo of the song. This intervening variable, however, did not apply to the control group since they had time to focus on the text without the disruption of the music. Choosing answers form the word list in the post-test also left the door open for wild guesses and consequently less reliable answers.

The short time of the treatment activity can be also regarded as the most significant cause for the negative result. As mentioned earlier in the second chapter, Krashen believes it takes one or two hours of good input for the Din to happen. Therefore we should not expect Din to happen in only five minutes or so. For this reason, the presence of music seemed unsupportive.

**Conclusion:**

Considering the acquired data and the analysis, we can conclude that in this case, music negatively affected the short-term process of learning a foreign language vocabulary. But this result is perhaps not the general case. This pilot study paves the way for further research in the
field of learning a foreign language by listening to music. By improving the weaknesses and overcoming the barriers mentioned in the previous section, the intended result can be definitely obtained.

Based on the findings of this study, choosing songs according to the interests of the learners and having sufficient number of practice sessions are among the fundamental characteristics of an ideal setting to enjoy music as a didactic tool. Pre-testing the groups to assure the homogeneity of the study groups and using a sufficient number of subjects are also considered as necessities for gathering valid and reliable results. It is in this setting where the true essence of the didactic benefits of music can be measured.

Applying the same method to a larger amount of subjects with more practice sessions is a promising research topic for examining the effects of music on the long-term learning process of a foreign language. Another point is to test whether listening to music enhances the phonological knowledge of learners or not. Another unanswered question is whether the lyrics of song improve the syntactic and grammatical competence of learners. More studies must also be done on various age groups of learners to determine the impact of music on different stages of development. Such questions are left for further research.
Appendix A: Class activity

Du är det finaste jag vet
Du är det dyraste i världen
Du är som stjärnorna
Som vindarna
Som vågorna
Som fåglarna
Som blommorna på marken

Du är min ledstjärna och vän
Du är min tro, mitt hopp, min kärlek
Du är mitt blod
Och mina lungor
Mina ögon
Mina skuldror
Mina händer och mitt hjärta

Friheten är ditt vackra namn
Vänskapen är din stolta moder
Rättvisan är din broder
Freden är din syster
Kampen är din fader
Framtiden ditt ansvar

You are the finest I know
You are the most precious in the world
You are like the stars
As the winds
As the waves
As the birds
As the flowers on the ground

You are my guiding light and friend
You are my faith, my hope, my love
You are my blood
And my lungs
My eyes
My shoulders
My hands and my heart

Freedom is your lovely name
Friendship is your proud mother
Justice is your brother
Peace is your sister
The fight is your father
The future is your responsibility
Appendix B: Post-test

Mother tongue(s): Nationality:

Gender: Age:

Fill in the blanks using the word list:

Du är det .....1....... (finest) jag vet, Du är det ......2...... (most precious) i världen, Du är som ......3...... (stars), Som ......4...... (winds), Som ......5...... (waves) Som ......6...... (birds), Som ......7...... (flowers) på marken, Du är min ledstjärna och vän

Du är min ......8...... (faith), mitt hopp, min ......9...... (love), Du är mitt blod, Och mina lungor, Mina ......10...... (eyes), Mina skuldror, Mina händer och mitt hjärta

......11...... (freedom) är ditt vackra namn, ......12...... (friendship) är din solta moder, ......13...... (justice) är din broder, ......14...... (peace) är din syster, kampen är din fader, ......15...... (future) ditt ansvar

word list (3 extra words)

<table>
<thead>
<tr>
<th>friheten</th>
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<th>vindarna</th>
</tr>
</thead>
<tbody>
<tr>
<td>dyr</td>
<td>ögon</td>
<td>blommorna</td>
</tr>
<tr>
<td>tro</td>
<td>finaste</td>
<td>freden</td>
</tr>
<tr>
<td>stjärnorna</td>
<td>orättvisan</td>
<td>rättvisan</td>
</tr>
<tr>
<td>vänskapen</td>
<td>vågorna</td>
<td>kärlek</td>
</tr>
<tr>
<td>framtiden</td>
<td>fåglarna</td>
<td>dyraste</td>
</tr>
</tbody>
</table>
List of References

http://www.youtube.com/watch?v=9wl1CmXblKQ


