The Effect of Background Music While Silent Reading on EFL Learners’ Reading Comprehension

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Abstract

This study attempted to determine the effect of background music while silent reading on Iranian EFL learners’ reading comprehension. The participants were 57 Iranian EFL learners between the ages of 14 and 16 in two 3rd grade high school classes at pre-intermediate proficiency level. Before treatment, both experimental and control groups took a reading comprehension pretest. In the experimental group, the researchers played Mozart sonatas as background music and asked them to read the passage silently and then answer the reading comprehension questions. In the control group, the procedure was the same, but no music was played while silent reading by the students. After ten sessions, the students of both groups were asked to answer another independent but parallel form of reading section of PET as their post-test. The independent samples t-test results indicated that the experimental group outperformed the control group in reading comprehension posttest, and listening to background music while silent reading had a significantly positive effect on Iranian EFL learners’ reading comprehension. The results of the present study have implications for EFL students, teachers, and teacher educators as well as syllabus designers and materials developers.

Keywords: Background music, Silent Reading, Reading Comprehension, Mozart Effect
Introduction

We read almost every day, consciously or unconsciously. All of us are silent readers in our everyday lives. Although teachers have forced us to read loudly in English classes, we are rather accustomed to silent reading. Silent reading is rightly a good way of exercising reading skill. It is also believed that good reading habits, including silent reading, paves the way for developing other language skills (Hoover & Gough, 1990).

Moreover, we are surrounded by written words; they are everywhere serving different functions such as confusing, depressing, enlightening, amusing, etc., and we are living with texts. In fact, as noted by Brown (2000), all of us are dependent on some limited number of letters throughout our lives. Therefore, it is clear that the ability to read in a second or foreign language can be regarded as one of the most important skills for all people. Also, reading is the basis of instruction in all aspects of language learning: using textbooks for language courses, writing, revising, developing vocabulary, acquiring grammar, editing, and using computer-assisted language learning programs.

On the other hand, in this modern life, music is prevalent everywhere. Various types of music exist in almost all aspects of our lives. Every day, we wake up with a piece of music that we have chosen for the alarm of our smartphones. On the way to work, in our cars or taxi, we listen to music. During the work hours, we have our headphones on our ears, and after work we put ourselves in contact with music, consciously or subconsciously. Even when we are in a supermarket for buying everyday needs, we are inadvertently listening to the music played in the loudspeakers.

Most of the music which has surrounded us is in the form of background music. This type of music is so widespread and common that we may not be aware of it in the immediate environment. Radocy and Boyle (1988) define background music as any piece of music played while the listener's attention is focused primarily on a task or activity other than listening to music. Depending on the individual listener and the nature of the task or activity in which the listener is involved, the function of background music could be different. Considering the students as individuals who listen to music, the
task or activity could be studying or some other form of academic preparation.

On the other hand, the Limited Capacity Model of Motivated Mediated Message Processing or LC4MP, shortly known as “Limited Capacity” theory is an explanatory theory that assumes humans have a limited capacity for cognitive processing of information. In general, as Pool, Koolstra and Van Der Voort (2003) noted, theories of limited capacity propose that individuals’ mental capacities for processing information are limited. As a result, when an individual attempts to do two simultaneous tasks that compete for their mental resources, one of the tasks will suffer. For example, an easy task demands little effort while a complex or difficult task requires more effort. Therefore, according to the capacity model of attention, one may fail to perform an activity because the supply of attention does not meet the demands. In other words, a task or activity fails because relevant information during the input process was not recognized since that person was unable to pay enough attention to process the information (Tze & Chou, 2010). Again, Kahneman’s (1973) theoretical framework on the capacity model of attention provides a theoretical base on how music could potentially be distracting to a cognitive task such as reading.

Among other kinds of music, there is a controversial concern on a certain music piece composed by Mozart, known as Mozart effect. This refers to the popularized versions of the hypothesis that listening to Mozart makes you smarter; that early childhood exposure to classical music has a beneficial effect on mental development; that Mozart’s music can enhance general intelligence (Rauscher, 1999). More technically, according to Rauscher and Hinton (2006), the Mozart effect originally referred to the phenomenon of a brief enhancement of spatial-temporal abilities in college students after listening to a Mozart piano sonata (K. 448).

In a popular presentation of the Mozart effect, Campbell (1997) condensed the world's research on all the beneficial effects of certain types of music and enlisted some benefits of the Mozart effect in the following way. He believed that Mozart:

- Improves test scores
- Cuts learning time
- Calms hyperactive children and adults
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- Reduces errors
- Improves creativity and clarity
- Heals the body faster
- Integrates both sides of the brain for more efficient learning
- Raises IQ scores 9 points (research done at University of California, Irvine)

The concept was generally accepted by the public since people are always interested in easy ways to boost their own and their children’s IQs, but the results of some studies done by psychologists (such as Steele, 2000; Thompson, Schellenberg, & Husain, 2001) refuted the original findings and presented competing theories for the Mozart effect. They argued, in essence, that the Mozart effect was merely an artifact of improved test performance and not improved intelligence.

In order to discuss the facilitating effect of music in learning, it is worth focusing on the Theory of Multiple Intelligences (MI). As teachers, all of us have experienced that each of the students have their own style of learning, which depends on their intelligence. In general, intelligence is the ability of an individual to perceive information, and retain it as knowledge to be applied towards adaptive behaviors within an environment. Gardner (1993) defined intelligence as “the capacity to solve problems, or to fashion products, that are valued in one or more cultural or community settings” (p.7). Later and from another perspective, Gardner (1999) himself defined intelligence as “bio psychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture” (p. 33). According to him, a human does not possess only a single intelligence, but a range of intelligences, each with its own observable and measurable abilities.

Gardner's theory argues that the students will be better served by a broader vision of education, wherein teachers use different methodologies, exercises and activities to reach all students, not just those who excel in linguistic and logical intelligence. It challenges educators to find “ways that will work for this student learning this topic” (Gardner, 1999, p.154).

Moreover, the idea of using music in language teaching is not a new one. Music plays an important role in the world, and it plays an extremely
important role in the lives of teenagers and young people. Therefore, music and use of musical intelligence could have a legitimate part in teaching a language. The effect of music on different aspects of foreign language learning has been studied for many years. A growing number of researchers were interested in investigating the effects of background music on language learning and reading comprehension (Hall, 1952; Etaugh & Michals, 1975; Etaugh & Ptashnik, 1982; Tucker & Bushman, 1991; Bowman, 2007; Southgate & Roscino, 2009; Rashidi & Faham, 2011). Due to the generally positive research findings discovered by these scholars, the application of background music to different levels of education began to receive more attention. But on the other hand, some other studies were focused on distracting effect of music on language learning (Smith & Morris, 1977; Furnham & Strbac, 2002; Hallam, Price & Katsarou, 2002; Dobbs, Furnham & McClelland, 2011).

This area of research regarding music and its effects on different aspects of language learning has been going on for some time, but mixed results were obtained. By understanding the complexities of music, cognitive output, and the interaction between the factors like the relaxing effect of music and cognitive processes such as reading, research can be led in a more beneficial direction. In this direction, it would be possible to differentiate between the varying facets of cognitive ability and musical processing. The present study tried to add to the collection of well-directed research and provide further evidence for the facilitative role of music in learning and more specifically in improving reading proficiency. The findings may have practical pedagogical uses for language theorists, educators, researchers, teachers, and learners. Syllabus designers may also have a chance to ponder about the inclusion of music in Iranian EFL textbooks that taps the learners’ musical intelligence and uses it as a tool for improving learning.

Based on the purpose of the study elaborated above, the following research question was addressed in the present study: Does background music while silent reading have any significant effect on improving Iranian EFL learners’ reading comprehension?
Method

Participants

The participants in this study were a total number of 57 female Iranian EFL learners selected by convenience sampling in a public high school of Khoy, West Azerbaijan, Iran. They were students of third grade of senior high school with the age range of 14 to 16 years. According to the results of Preliminary English Test (PET), the proficiency level of the students was pre-intermediate. The learners were, then, randomly assigned into two groups: the experimental group including 28 students, and the control group which included 29 students.

Instrumentation

Cambridge University’s Preliminary English Test (PET) was used to ensure the participants’ homogeneity. PET is an English language examination provided by Cambridge English Language Assessment (previously known as University of Cambridge ESOL examinations). PET or Cambridge English Preliminary test is an intermediate level qualification which demonstrates the ability to communicate using English for everyday purposes.

Parts 3, 4 and 5 of the reading section of Cambridge University’s Preliminary English Test (PET) were used as pre-test in order to measure the reading comprehension of the participants before treatment. According to the standards of Cambridge English Language Assessment, the third part is a factual text, and includes 10 true/false questions. Part four is a text which conveys an attitude or opinion as well as factual information in the form of 5 multiple-choice questions. Part five of reading section is a factual or narrative text with 10 multiple-choice cloze questions.

During the 10 sessions of treatment period of this research, the first 10 units of Read and Understand, book One (2005, Hirkapatrick&Mok) were taught. The titles of the units were: Green Packaging, Too Much Traffic, Bullying, Growing Old, Parental Aspirations, Discrimination against Disability, Football Hooligans, Travel Troubles, New Research on Computer Games, and Terrorism.
The music that was played in the background during the experimental procedures consisted of Mozart piano sonatas, which are non-lyric pieces of soft classic music. The decision to use Mozart piano sonatas was based on the assumption that although the present study did not focus on Mozart effect, this type of music has been proven to stimulate the brain in previous research (Rauscher, Shaw & Ky, 1993). Also, the current study was an attempt to check the Mozart effect in Iranian EFL context in one way or another. A portable stereo component CD system was used to play music for the participants in music (experimental) group.

In order to measure the plausible effects of treatment, a post-test was administered after the treatment period. The post-test was another independent but parallel form of reading section of the PET for school.

**Procedure**

In the first step, in order to ascertain that both classes were homogeneous, all the participants took a proficiency test (i.e. Preliminary English Test PET). Parts 3, 4 and 5 of the reading section of the Preliminary English Test (PET) which is related to reading comprehension of the learners was regarded as pre-test.

At the beginning of the educational year, the researcher described the concept of silent reading to the participants and its effects as a classroom task and asked the students to read the texts of their textbook silently in the class. In each session, the teacher started the class with three or four pre-reading questions related to the topic. Then she introduced the vocabulary items which she predicted to be unknown for the learners. Following the vocabulary study, the background music was played in the experimental group and the students were asked to read the reading passage silently and then answer the reading comprehension questions. In the control group, the procedure was the same, but no music was played while silent reading of the students. The treatment period took 10 sessions for both experimental and control groups, and during the class sessions, students studied 10 texts from Read and Understand, book One (2005, Hirkapatrick & Mok) and wrote their answers to the follow-up comprehension activities. The experimental group accomplished silent reading and answered the reading comprehension tests while listening to background music during the class session, and the
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control group did silent reading and took the same comprehension tests in a quiet atmosphere. For both groups, the teacher answered the questions, and after doing the tasks by students, she checked the answers of reading comprehension test to make sure they were correct.

After ten sessions, the students of both experimental and control groups were asked to answer another independent, but parallel form of reading section of PET as their post-test. The scores of comprehension questions for both pre-test and post-test was on the basis of interval data, and there was one score for each correct answer without any negative scores. The scores were analyzed later to compare the performance of the control and experimental groups in reading comprehension tests.

Design

This educational research study approximated the conditions of a true experimental study; however, without the control or manipulation of all variables, it must be considered a quasi-experimental research design. The participants’ performance was assessed by counting the total number of correct answers to comprehension questions. The current research involved two variables: one independent and one dependent variable. The independent variable of the study was background music while silent reading, and the dependent variable was the learners’ performance score on reading comprehension test.

Results

The purpose of the current study was to investigate the effect of background music while silent reading on the reading comprehension of senior high school students. Accordingly, this study examined the differences in raw scores obtained on two standardized reading comprehension tests given in two different conditions: (a) a typical (non-music) classroom, and (b) while listening to non-lyrical music playing in the background at a preset volume.

Initially, in order to ensure the homogeneity of the two groups of learners regarding their English language proficiency before the treatment, an independent samples t-test was conducted on the scores of learners from
Preliminary English Test (PET). Then, scores from both groups’ pretest and post-test were analyzed using paired and independent-samples t-test to answer the research question which is related to the difference between participants’ reading comprehension ability before and after treatment. It should be mentioned that in order to estimate the reliability for pre-test and post-test, Cronbach's alpha was calculated. Also, the normality assumption was calculated to see if the data were normal before being put into analysis.

1- Reliability Analysis of the Instruments

As stated before, the pre-test and post-test used in this study were parts 3, 4 and 5 of the reading section of PET. The Preliminary English Test (PET), which is a standard practice in Cambridge ESOL, is periodically reviewed as part of the examination production process, to ensure that they remain fair, up-to-date and in line with learners’ expectations. So, as a standardized test, the Preliminary English Test (PET) is considered as a validated test.

In order to ensure the internal consistency of the pre-test and post-test, Cronbach’s alpha was chosen as the reliability index.

The reliability indices for the pre-test and post-test were .724 and .712, respectively; according to a commonly accepted rule of thumb (George & Mallery, 2003) for describing internal consistency the Cronbach’s alpha value between 0.7 - 0.9 is fine and acceptable for low-stakes testing. Therefore, the pretest and posttests proved to be valid measures for testing the effect of treatment. In order to test that the data gathered from students' pre-tests and post-tests is normally distributed, the normality assumption was calculated.

Table 1
Test of Normality

<table>
<thead>
<tr>
<th></th>
<th>Kolmogorov-Smirnov</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistic df Sig.</td>
<td>Statistic df Sig.</td>
</tr>
<tr>
<td>ExGrPreTest</td>
<td>.129 28 .200</td>
<td>.957 28 .302</td>
</tr>
<tr>
<td>CoGrPreTest</td>
<td>.100 28 .200</td>
<td>.980 28 .859</td>
</tr>
<tr>
<td>ExGrPosTest</td>
<td>.137 28 .192</td>
<td>.930 28 .060</td>
</tr>
<tr>
<td>CoGrPosTest</td>
<td>.182 28 .218</td>
<td>.918 28 .086</td>
</tr>
</tbody>
</table>
For this reason, the researcher used the Shapiro-Wilk test as the numerical means of assessing normality. As displayed in Table 1, the probabilities associated with the Shapiro-Wilk tests were non-significant (t = .302 and .859, p ≥ .05) for pre-test scores of the experimental and control groups, and (t = .060 and .086, p ≥ .05) for post-test scores of the experimental and control groups respectively. Hence normality of the present data was met. This is supported by the conviction that if the p-value is greater than the chosen alpha level, then the null hypothesis that the data came from a normally distributed population cannot be rejected (Field, 2013).

1- The Results of Homogeneity Test
The purpose of administrating Cambridge University’s Preliminary English Test (PET) at the beginning step of the study was to assess whether learners are homogeneous in terms of language proficiency or not. In order to test the homogeneity of the participants in the experimental group and control group, an independent samples t-test was utilized by the researcher.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Descriptive Statistics of PET Scores of the Two Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group</td>
</tr>
<tr>
<td>PET score</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

As table 2 shows the mean PET scores of the experimental (N=28, Mean= 64.39) and control groups (N=29, Mean= 65.07) are very close to each other. Moreover, the results of T-test for checking the homogeneity of the participants in the experimental and control groups are shown in Table 3.
Table 3
Independent Samples Test Results for the PET Scores of the Experimental and Control Groups

<table>
<thead>
<tr>
<th>PET score</th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>.001</td>
<td>.975</td>
<td>-.205</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-.205</td>
<td>54.92</td>
<td>.838</td>
</tr>
</tbody>
</table>

As presented in Table 3, the significance value is .838, which is more than the critical p value of 0.05 (P = .838 > .05), which means that the difference between the two groups is not significant. So it is concluded that the two groups are homogeneous with respect to their reading skill at the outset. Therefore, any possible differences in their post-test scores could safely be attributed to the effect of the treatment.

2- Testing the Research Hypothesis

In order to examine the probable improvement of Iranian EFL learners’ reading comprehension while silent reading with background music, the researcher ran an independent samples t-test to test the research hypothesis and compare the mean scores of the experimental group and control group after treatment. The present t-test was conducted in order to examine the effect of background music while silent reading on the improvement of the reading comprehension ability of the students after the administration of the treatments. The improvement or gain score from pretest to posttest was computed for each participant by subtracting each person's pretest score from her posttest score.

The descriptive statistics for the performance of the participants in the experimental and control groups after treatment are displayed in Table 4.
Table 4
Descriptive Statistics of Experimental and Control Groups’ Gain Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>GainScore</td>
<td>1</td>
<td>28</td>
<td>2.64</td>
<td>2.215</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>29</td>
<td>1.34</td>
<td>1.914</td>
</tr>
</tbody>
</table>

According to the results displayed in Table 4, it is clear that on average, group 1 or experimental group (M = 2.64) outperformed group 2 or the control group (M = 1.34). It was concluded that listening to background music while silent reading had affected the students overall reading comprehension ability. However, to be on the safe side, an independent samples t-test was run to determine whether the gain was statistically significant or not. The results are shown in Table 5.

Table 5
Independent T-test comparing Gain Scores of Experimental and Control Groups

<table>
<thead>
<tr>
<th>GainScore</th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>GainScore</td>
<td>.828</td>
<td>.367</td>
<td>2.370</td>
</tr>
<tr>
<td></td>
<td>Equal variances assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.364</td>
<td>53.26</td>
<td>.022</td>
</tr>
</tbody>
</table>

As Table 5 illustrates, there is a significant difference in the reading comprehension performance of the participants in each group (t (55) = 2.37, p < .05); the p-value was 0.021 (Sig (2-tailed) = .02>0.05). As shown in table 5, the critical value (.02) was less than.05, which means the value was statistically significant at p< 05 level. Thus, the null-hypothesis (H0) claiming that there is not any significant difference between gain scores while silent reading with and without background music was rejected.
Discussion

The researcher hypothesized that background music while silent reading does not have any significant effect on improving Iranian EFL learners’ reading comprehension, but the results rejected this null hypotheses and proved the effectiveness of listening to background music while silent reading on Iranian EFL learners’ reading comprehension progress. The improvement resulted from treatment, i.e. listening to non-lyrical music while silent reading was statistically significant.

The result of this study is in line with theoretical ideas of the scholars regarding the importance of listening to music in learning including Behar (2000), Bryant-Jones, Shimmins and Vega (2003), Dinsmore (2003), Schellenberg (2004), White (2007) and Ornerova (2009) to name a few. Also the results support the notions of Mursell (1937), Farnsworth (1969), Whittaker (1981), Wallace (1994), Blodget (2000), Abbott (2002), Mishan (2005) and Kang and Williamson (2012) who believed that listening to music acts as a facilitator for students’ language learning in a way or other.

Although the main concern of the present study was not Mozart effect, as the music used in the period of treatment in the experimental group was some pieces of Mozart sonatas, the results lend support to the findings of Rauscher et al. (1993) and the studies done by Campbell (1997), Steele (2000), Thompson et al. (2001) as well as Bangerter and Heath (2004) who worked on Mozart effect either as an artifact of improved test performance or improved intelligence.

However, the results of the present study were inconsistent with some previous studies, which claimed that background music can have a negative effect on the second or foreign language students’ learning process. The results of this study rejected the findings of Furnham and Strbac (2002) who concluded that background music can have a negative effect on the performance of complex cognitive tasks. Also, the results of the research accomplished by Hallam et al. (2002) who found that playing music had a negative effect on the performance of various cognitive tasks and that it also led to a lower level of reported social behavior is rejected.

The results of this research is supported by the results of a study done by Etaugh and Michals (1975) who found that the college students who normally listened to music while studying did better on the reading
comprehension test. This study is also congruent with the work done by Rashidi and Faham (2011) who concluded that the students to whom reading comprehension was taught with a music background outperformed the learners who were taught with no music background.

The most likely explanation of the positive effect of background music while silent reading on reading comprehension comes from the previous studies which have indicated that background music can raise psychophysiological arousal levels, which then has beneficial impact on concurrent cognitive tasks (Sloboda & Juslin, 2001). The relationship between music and higher enjoyment which leads to higher degree of achievement and learning in Arousal-Mood hypothesis is important when considering how likely a person is to persevere with their language learning. The fact that music boosts enjoyment and sense of achievement could be a factor that leads people to understand the text they are reading.

Another explanation of the findings could be linked to the Mozart effect presented by Mozart et al. (1993) and followed by other scholars. Of course, the results of the present study could not be regarded as the simplistic ideas that listening to a number of Mozart’s music make learners smarter. But considering the studies and findings of this study, it would appear that background music listening in itself does not directly make us smarter, but that its effects are all about arousal. This arousal enhances levels of on task performance and the readiness to engage in short-term learning projects.

From another viewpoint, the outperformance of the experimental group may have something to do with Krashen’s (1982) Affective Filter Hypothesis in that when learners are in unfavorable situations they may develop an affective filter which in turn can reduce language internalization. Therefore, it can be concluded that the background music while silent reading in this study, by reducing stress and negative emotions, may have created a favorable condition in which better reading comprehension took place.

Following the core concept of suggestopedia, relaxed and focused state is the optimum state for learning. It seems that music can make the learners feel comfortable and confident, which leads to better performance. According to Gagne and Briggs (1979), the basic purpose of education is to
bring individuals closer to the goal of optimal use of talents and enjoyment of life. Therefore, one way to have a successful education is to have an easier and more comfortable and enjoyable learning atmosphere, and in order to create such a setting, as the findings of the present study showed, background music could be utilized. Background music can be helpful in making language learning easier, more successful and more enjoyable. Listening to music while learning a new language contributes to a quality education which addresses the unique abilities of each learner, and it contains a positive emotional experience. This might be developed to a love of language learning which could remain with the learners for a lifetime.

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**Biodata**

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