Do people's musical preferences impact the effect of music on their reading comprehension?

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Abstract

Prior studies have found that arousal after listening to music can affect results on a cognitive task, so the present paper proposes a study to investigate how listening to one's favorite music and music that one does not like affects arousal, and how this may impact performance on reading tasks. Additionally, most studies on music and cognition are conducted in English-speaking samples, so our study will also contribute to the literature by using a Vietnamese-speaking sample. Specifically, this study asks: Does people's musical preference impact the effect of music on their reading comprehension? We will conduct an experiment with a sample of 50 Vietnamese high school students comparing the performance in reading tasks of two groups: one that listens to their favorite music and one that listens to disliked music. We hypothesize that listening to preferred music will lead to increased arousal compared to non-preferred music, which will in turn lead to increased scores on the reading comprehension task. This study will improve our understanding of how the effect of music on people's reading comprehension varies based on musical preference.

Keywords: reading comprehension, music preference, arousal, Vietnamese-speaking sample

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In libraries around the world, some students have headphones on and listen to music while they study and read. Many students believe that music can help them concentrate better on their task (Robert Half Talent Solution, 2018). Studies have found that listening to specific types of music may boost people's performance on cognitive tasks by increasing their arousal level (Dong, 2020; John et al., 2006; Schellenberg et al., 2007). Building on these prior studies, we will further investigate how listening to preferred versus non-preferred music affects people's arousal, which may, in consequence, affect their reading comprehension performance. Therefore, in this paper, the proposed study will investigate whether people's musical preference impacts the effect of music on their reading comprehension.

Music and cognitive task performance

Reading comprehension is the ability to process and understand a written text and integrate it with information that the reader already knows, allowing individuals to understand and obtain information from readings. Reading comprehension is needed in many tasks in daily life. For students, examples include reading and understanding the content of the textbook to prepare for their next lessons, reading different research papers and other documents, or taking exams such as the SAT or any language proficiency tests. For workers and employees, they also need to read different documents; strong reading comprehension skills allow workers to understand instructions thoroughly and grasp key information more quickly.

Given that reading comprehension is critical for many daily activities, many researchers have studied ways to boost this skill. According to a study by Pourhosein Gilakjani and Sabouri (2016), reading comprehension can be improved by using effective strategies such as recognition of text organization, as well as linguistic, schematic, and metacognitive strategies. Though future studies are required to support this idea, we believe that to be able to use a strategy, individuals may have to join classes and training sessions which are, most of the time, time consuming and dull. Music, on the other hand, may present a quicker and more enjoyable way that people can use to help them focus better. In fact, many students and workers listen to music while working with the belief that it can help them concentrate better (Robert Half Talent Solution, 2018).

As a result, many studies have been conducted around the effect of music on human's cognition and reading comprehension. Researchers used many different types of music such as Jazz and classical music (Pramono et al., 2019), Mozart's music with either Albinoni's music, popular children's music (Schellenberg et al., 2007), or the one-person computer game: Tony Hawk Pro Skater 3's background music (preferred music) (Cassity et al., 2007). Amongst all the music types that have been researched, Mozart's music was shown to have the most significant effect (Dong, 2020; Schellenberg et al. 2007). One experiment in a study by Schellenberg et al. (2007) had 48 undergraduates listen to either Mozart's or Albinoni's music and then do either a pattern matching or number-letter sequencing task. Then, after a week, they came back to listen to the other music and do the other task. Results showed that the participants who listened to high tempo Mozart performed better in the pattern matching tasks than the ones who listened to Albinoni music, which is typically slower and considered sadder. In addition, a study by Dong (2020) showed an increase in reading comprehension performance with Mozart background music. Both studies concluded that these task performance increases were related to the music boosting the participants' arousal levels.

Performance also improves with music beyond that of Mozart. For example, people who play driving games have a better performance when listening to their music of preference (Cassidy & MacDonald, 2009). However, research is mixed as in a study by Perham and Currie (2014), 30 undergraduates from South Wales University did a reading cognition task (i.e., SAT reading test) while listening to either their liked music, their disliked music, non-lyric music, or in quiet condition. The results showed that participants who listened to their liked music had the same performance as the ones who listened to their disliked music. Additionally, the performance of the participants who did the task in a quiet condition had the highest performance out of all the other groups.

While listening to preferred background music during a task has been shown to have negative effects on reading comprehension (Perham & Currie, 2014), a study by Schellenberg et al. (2007) showed that listening to preferred music before doing the task has a positive effect on cognitive task performance. However, there is a need to still investigate whether listening to preferred music before doing a reading comprehension task aids people's performance on that task.

In summary, the existing literature demonstrates that listening to non-lyric, high tempo music, such as Mozart's, would aid one's performance on cognitive tasks, while listening to background music caused a negative effect on one's performance on reading comprehension tests, no matter if the music was preferred, non-preferred, or non-lyrical. Whether listening to preferred music before doing the task would help one perform better on a reading comprehension task is yet to be explored. The present study addresses this gap by proposing a study to examine whether people listening to their preferred music before doing a reading comprehension test have a higher score on the test than those who listen to non-preferred music before doing the test.

Research Proposal

To address the gap in the literature, the proposed study will examine whether people's musical preference impacts the performance effect of listening to music prior to a reading comprehension task.

Participants

We will recruit a total sample of 50 middle school and high school students aged 13 to 18 years old who studied at middle schools and high schools around Hanoi, Vietnam. They will be recruited via advertisement on social media and given 25k VND each for participating. The male to female ratio will be approximately 1:1. All participants should have good vision and hearing, and all of them will be native Vietnamese speakers and able to read fluently in Vietnamese (around a 10th grade - a high school level). They will be divided into two conditions - Liked and Disliked - with 25 participants each. In the Liked condition, the participants will listen to their preferred music, while in the Disliked condition, the participants will listen to the music that they probably do not like. In both conditions, the participant's level of liked and disliked and familiarity of the music will be measure using a questionnaire.

Measures

Level of Arousal. To assess participants' level of arousal before and after listening to music, we use the Profile of Mood States (POMS; McNair et al., 1992). This questionnaire includes 6 subscales and a total of 40 questions that can be used to measure the mood and level of arousal of the participants. However, in this study, our interest is only limited to one aspect which is the Vigor activity - a measure of arousal. This subscale includes only 5 questions, in which participants will rate how they feel right now on a 5-point Likert scale from 0

(not at all) to 4 (extremely). The sum of the participants' rating for each question represents their level of arousal, where 0 points represents not aroused and 20 points represents extremely aroused.

Music Preference and Familiarity. To verify participants' like and dislike of the music, we will ask each participant to rate on a scale of 1-7 how much they enjoyed the music in which 1 is extremely not enjoyable and 7 is extremely enjoyable. They will also rate their familiarity to the music on a 7-point scale from 1 (not familiar) to 7 (very familiar).

Reading Comprehension. We will use the multiple choice part of the Vietnamese Literature section of the High-school Student Assessment (Hanoi National University of Education, 2022). This test includes three reading passages with 5 questions for each passage. They have 30 minutes to complete the test. The total possible score for the test is 15.

Music. In the Liked condition, the participants will be asked to bring their playlist that they frequently listen to, so that we can play it for them on the loudspeaker. In the Disliked condition, the music will be old Vietnamese music in the decades between the 1970s - 1980s, specifically a playlist of Vietnamese Bolero music. We expect that most young Vietnamese students do not like Bolero typically considered quite old fashioned. We will rearrange the condition once we have had the music preference rating of the participants.

Procedure

First, the participants are administered and complete the POMS to measure the participants' arousal level before listening to the music. Then, the music will be played to the participants via a loud speaker for 10 minutes. After, the participants complete the POMS for the second time to measure their arousal level after listening to the music. Subsequently, the participants will do the reading comprehension test for 30 minutes, which is followed by the Music Preference and Familiarity questionnaire to make sure the participants dislike the music in the Disliked condition or vice versa. If the participant actually enjoys and is familiar with the selected disliked music for the Disliked condition, they will be moved to the Liked condition. This also applies to the Liked condition: if they do not like the music in their playlist, they will be moved to the Disliked condition. After answering all the questions, the participant has completed their portion of the study. Their reading comprehension test will be scored by a computer, and we will analyze and compare their test score with their data from the questionnaire to examine the relationship between music preference and reading comprehension.

Setting

The participants will complete the task individually in a classroom which is around 9 to 12 m^2. The room will have neutral colored walls (either gray or white) with a comfortable temperature (i.e., around 25 $^\circ$C), and good lighting. There will be a loudspeaker placed in the top left corner of the room. The volume will be set by the participants: we will play a sample of a default sound before actually playing the music so that the participant can either increase or reduce the volume so that it is comfortable to them. There will also be a laptop, in which the questionnaires and the test are already loaded for them on the table in the middle of the room.

Hypothesized Results

In this study, I hypothesize that the Liked condition will have a higher arousal level after listening to the music, and therefore, have a better performance on the reading comprehension test than the Disliked condition. Due to the preferred effect shown in the second experiment by Schellenberg et al. (2007) in which kindergarten children have the best performance on cognitive tasks when listening to their familiar and preferred children's songs, and the study by Cassidy and MacDonald (2009) in which participants scored higher when playing driving games

with their self-selected soundtrack (which is preferred), we expect that preferred music can better enhance participant's arousal and accordingly boost their reading comprehension (which is also a cognitive task) than non-preferred music.

If this hypothesis is supported, the results will support that listening to preferred music can boost arousal and enhance performance on reading comprehension tasks. As a result, people can use not only high tempo music, just like previous studies (Dong, 2020; Jones et al., 2006; Schellenberg et al., 2007) have shown, but also their preferred music to trigger arousal. Moreover, this finding will also show that music can only have a positive effect on reading comprehension performance when listened to before doing the task, not during the task like in the study by Perham and Currie (2014). Therefore, if the hypothesis is supported, students can listen to their preferred music before taking a reading test for improved performance. Additionally, having a high arousal level can enhance people's performance on reading comprehension tasks. Based on this finding and the results from prior research (Schellenberg et al., 2007), we would predict that enhancing arousal before not only reading comprehension tasks but also other cognitive tasks would improve performance, but more studies should be done in the future to support this.

However, limitations to the present study exist and there is still a question of whether people who listen to their preferred/non-preferred music before taking the reading comprehension test will get a higher score than the ones who sit in silence and do not listen to anything prior to the test. Therefore, there is a need for a further study which includes both liked and disliked conditions, where the participant listens to their preferred/non-preferred music before doing the task, and a control condition, in which the participant just relaxes in silence, without listening to any music.

If the hypothesis is not supported, there are various possibilities for this result which could be further explored. The first possibility is that there was no difference in the arousal and the reading comprehension of the two groups, which means that the preferred music actually has no effect on the arousal level and thus cannot boost reading comprehension performance. This would indicate that preference of music does not affect people's cognition, but the tempo of the music as shown in Schellenberg et al. (2007), Dong (2020), and Jones et al. (2006) can. Otherwise, it can also show that listening to music and then doing the task makes the effect of music fade away before the participant starts the task, indicating that music should be played while participants are doing the task, although this would need to be examined further as there was still a negative effect when preferred music and dispreferred music was played as background music in the reading comprehension task (Perham and Currie, 2014). This opens up to another question: How much time delayed after listening to music can cause a positive effect on reading comprehension?

The second possibility is that participants in the Disliked condition have higher arousal and perform better in reading comprehension than the Liked condition. This means that the music that people do not like can actually boost their arousal and thus enhance their reading comprehension, so music still has an effect on human's cognition, just in the opposite way: dispreferred music has a positive impact, while preferred music has a negative impact. Therefore, in this case, instead of listening to the music they like before doing a reading test, students should go for the type of music that they do not like. However, this finding goes against the preference effect which was shown in the study by Schellenberg et al. (2007), thus more studies should be conducted in the future to verify it.

Conclusion

This study addresses a gap in the literature on music and cognition. We investigated whether listening to preferred music prior to doing a reading comprehension task causes higher arousal and better reading comprehension than non-preferred music. In the proposed study, the participant will relax and listen to either their preferred or non-preferred music for 10 minutes and then complete a reading comprehension test. In addition to the test, they also fill in a questionnaire to check their level of arousal before and after listening to the music. Their results will be compared so that we can examine a potential trend between preference of music, arousal, and reading comprehension performance.

If we find that participants have higher arousal and better reading comprehension after listening to liked music compared to disliked music, then our study would provide evidence that music preference has an effect on boosting people's arousal. In addition, if the hypotheses are supported, listening to preferred music can also influence their reading comprehension so people are encouraged to listen to their favorite types of music before doing any task that involves reading.

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