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The Effect of Music Familiarity on Students' Reading Comprehension Performance

Heidi Johnson, Benjamin Holdredge, William Todd McKinley, Di Wu Ph.D.

Literature Review

Prior research indicated that many factors are related to the effects of music on cognitive performance.

- ♪ Characteristics of music
 - Some music genres (such as, screamo) may interfere with working memory (e.g., Brush, Ripley, & Wu, 2013).
- ♪ Complexity of cognitive performance
 - Music increased productivity by almost 20% for simple, monotonous tasks. Music might act as a distraction during complex tasks (e.g., Konz, 1962)
- ♪ Preference of music
 - Music significantly affected participants' attention test scores when they particularly liked or disliked the music (e.g., Huang & Shih, 2011)
- ♪ Personality (introverted or extroverted)
 - To function optimally, introverts require lower level of arousal while extroverts require a higher level of arousal (e.g., Avila, Furnham, & McClelland, 2012)

Two different hypotheses were proposed to explain the possible effects of music (e.g., Thompson, Schellenberg, & Letnic, 2012)

- ♪ Cognitive-Capacity Hypothesis - humans have a cognitive capacity for information which can be overwhelmed when listening to music ultimately deteriorating performance
- ♪ Arousal-Mood Hypothesis – listening to music elicits more positive emotions resulting in a happier mood and better performance on cognitive tasks.

Research Question

The current research aimed to examine the two hypotheses by asking whether music familiarity have an impact on students' reading comprehension performance.

- ♪ Prediction: Music familiar to the participant will decrease the participant's reading comprehension performance, while unfamiliar music will have no significant effect on the participant's reading comprehension performance.

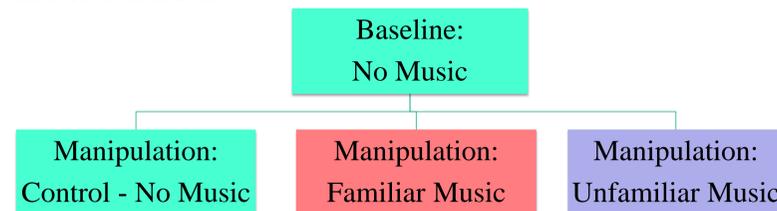
Method

Music familiarity survey:

- ♪ 46 undergraduate students evaluated their familiarity of 40 Christian rock songs (familiar, unfamiliar, and unknown).
- ♪ 5 familiar (84%) and 6 unfamiliar songs (95%)

Experiment:

- ♪ Participants:
 - 85 undergraduate students (24 males and 61 females)
- ♪ Materials:
 - SAT Comprehension Practice quizzes & Big Five Inventory personality test
- ♪ Procedure:
 - Students' demographic information (such as, gender, major, and music preference) was collected and their personality (introversion or extraversion) was measured.
 - Baseline–2 comprehension quizzes without music
 - Manipulation – 2 comprehension quizzes without music in the silent condition or with music in the familiar and unfamiliar music conditions.



Results

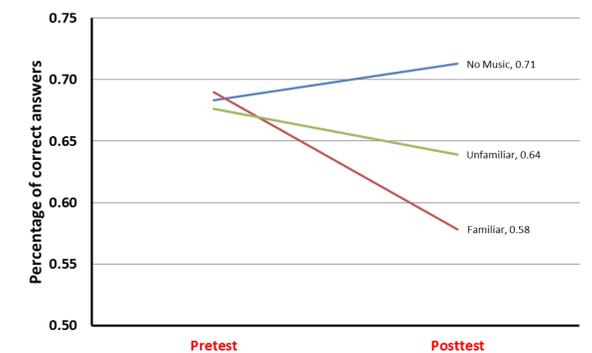
Comprehension performance is defined as the percentage of correct answers out of the total number of questions.

- ♪ No significant effects of gender, major, music preferences, and personality were found.
- ♪ A two-way ANOVA revealed a significant test effect $F(1,83) = 6.02, p = .016$ and interaction effect $F(2,82) = 6.60, p = .002$, but no significant effect of music conditions.

Results (cont.)

Planned multiple comparison revealed that

- ♪ Students in the familiar music condition had a significant lower posttest ($M = 0.58, SD = 0.18$) than pretest scores ($M = 0.69, SD = 0.15$).



Conclusions

As predicted,

- ♪ Familiar background music would have a more detrimental effect on students' reading comprehension than unfamiliar music or no music.
- ♪ It is noteworthy that though not significant, comparing to their pretest scores, students had lower posttest scores in the unfamiliar music condition but higher posttest scores in the silent condition.
- ♪ These results may reveal that music might interfere with students' performance in complex cognitive tasks, which is consistent with the cognitive-capacity hypothesis.

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