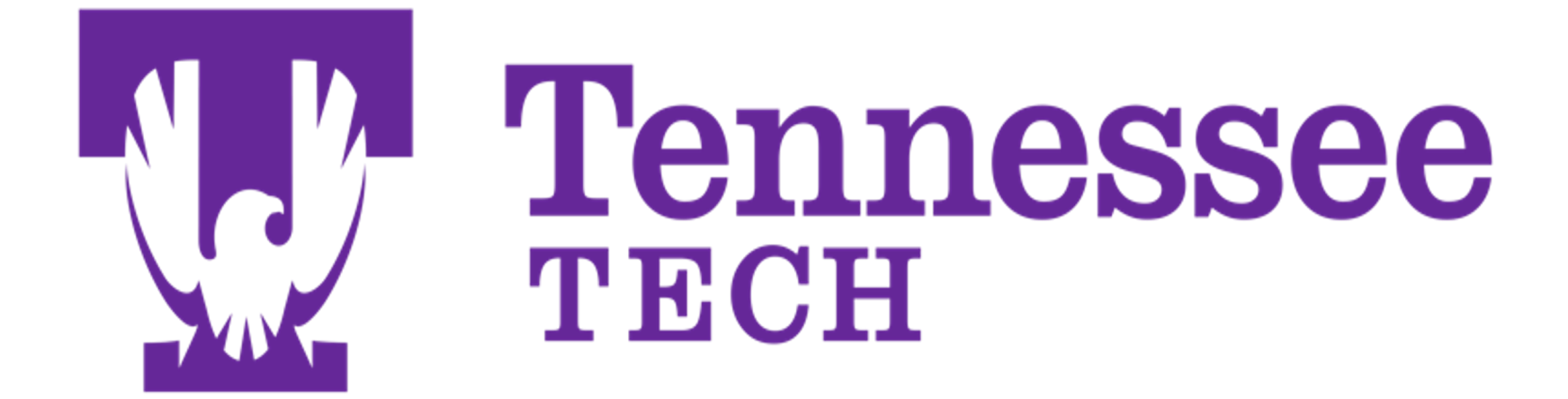


Emotional Music and its Effect on Reading Comprehension

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Introduction and Hypotheses

Research is split on the effect of background music on cognitive performance (6, 8, 11, 13). Much research has been done to study music and its possible distraction effects, but results have been inconclusive. Music is made up of many complex components, so further research into different characteristics of music is needed for future researchers to be able to make conclusions about the distraction of music as a whole.

Previous Literature

- Background music, regardless of genre, appears to have some negative effect on cognitive functioning (4, 6, 8)
- Regardless of its characteristics, music has been shown to interfere with reading and language comprehension (4, 7, 9)
- Music and language processing may overlap (3)
- Participants performed significantly better on a spatial task after listening to a happy piece and slightly lower after listening to a sad piece than when compared to the silent condition (15)
- Musicians performed worse on a language comprehension task when background music was played but completed more items correctly than non-musicians (9)

Research Need

- Continued research in this area may help future researchers make more generalized statements about background music's effect on cognitive functioning
- Results of the current study could help people make educated decisions about the music they listen to while working/studying

Hypotheses

1. The musical conditions will have different levels of negative effect on the reading comprehension scores of the participants. (Descending order: Happy, Sad, Scary)
2. Emotion recognition scores and reading comprehension scores will be negatively correlated.
3. Musical training and reading comprehension scores will be negatively correlated.

ANCOVA

Silence	Happy	Sad	Scary
N=12	N=13	N=13	N=12

Covariates: Musical Training and Emotion Recognition Scores

Method

- Participants met the researcher in an assigned computer lab with headphones provided by the researcher
- Participants were given five and a half minutes to read a passage (1) under one of four background conditions:
 1. Silence
 2. Happy Music: Beethoven's *Symphony no. 6* (3rd mvt.)
 3. Sad Music: Barber's *Adagio for Strings*
 4. Scary Music: Holst's *Mars-the Bringer of War*
- Participants were asked 10 questions about the passage to assess reading comprehension
- A music emotion recognition test was then given to the participants where they matched 12 music samples with the faces (2) that best represent the music's emotion



- Participants took the Perth Alexithymia Questionnaire (PAQ) (10)
- Participants filled out a demographics form that asked questions about musical training and other individual variables including sex, age, and if they finished reading the passage in the time given
- Participants had the option to fill out an extra credit form

Results

- Participants were 50 (25 Male, 25 Female) college students 18 years or older ($M = 20.78$, $SD = 4.80$). The study included 20 musically trained (2+ years) participants ($M = 7.45$, $SD = 4.33$).
- No significant effect was observed for background condition at $p < .05$ [$F(3, 46) = .65$, $p = .59$].
- Musically trained participants ($M = 5.30$, $SD = 2.45$) had significantly higher reading comprehension scores than nontrained participants ($M = 3.67$, $SD = 1.95$) [$F(1, 48) = 6.83$, $p = .01$].
- Years of musical training ($M = 2.98$, $SD = 4.33$) was significantly correlated with reading comprehension scores ($M = 4.32$, $SD = 2.29$), $r(48) = .36$, $p = .01$, with $R^2 = .13$.
- All other comparisons were nonsignificant.

Discussion

Significance of Findings

- Background music had no effect on reading comprehension scores
- Musicians seem to have an advantage over non-musicians on reading comprehension
- The more years of musical training a participant has, the higher their reading comprehension scores will be (on average)
- Reading comprehension advantages for musically trained individuals may be due to overlapping mechanisms in language and music processing (5, 9, 12)
- A musician advantage could be due to preexisting cognitive advantages that motivate people to begin musical training (5, 14)

Limitations

- Small sample sizes may have led to nonsignificant results
- The music emotion recognition test was not a good measure of emotion recognition ability

Future Directions

- The music emotion recognition measure needs improvement
- More research is needed involving different characteristics of music
- Investigation into the potential overlapping mechanisms in music and language processing should be examined further

References

1. ACT Reading Practice Test 2. (n.d.). Retrieved from <https://www.highschooltestprep.com/act/reading/practice-test-2/>.
2. Are There Universal Facial Expressions? (n.d.). Retrieved from <https://www.paulekman.com/resources/universal-facial-expressions/>.
3. Baddeley, A. D., & Hitch, G. (1974). Working memory. *Psychology of learning and motivation* (pp. 47-89) Elsevier.
4. Chou, P. T. (2010). Attention drainage effect: How background music effects concentration in taiwanese college students. *Journal of the Scholarship of Teaching and Learning*, 10(1), 36-46.
5. Corrigan, K. A., & Trainor, L. J. (2011). Associations between length of music training and reading skills in children. *Music Perception: An Interdisciplinary Journal*, 29(2), 147-155.
6. Dolegui, A. S. (2013). The impact of listening to music on cognitive performance. *Inquiries Journal*, 5(09). Retrieved from <http://www.inquiriesjournal.com/a?id=1657>
7. Kämpfe, J., Sedlmeier, P., & Renkewitz, F. (2011). The impact of background music on adult listeners: A meta-analysis. *Psychology of Music*, 39(4), 424-448.
8. Miller, C. (2014). The differentiated effects of lyrical and non-lyrical music on reading comprehension. *Theses and Dissertations*. 352. <https://irrw.rowan.edu/etd/352>
9. Patston, L. L., & Tippett, L. J. (2011). The effect of background music on cognitive performance in musicians and nonmusicians. *Music 14. Perception: An Interdisciplinary Journal*, 29(2), 173-183.
10. Preece, D., Becerra, R., Robinson, K., Dandy, J., & Allan, A. (2018). Perth Alexithymia Questionnaire (PAQ): Copy of questionnaire and scoring instructions.
11. Salamé, P., & Baddeley, A. (1989). Effects of background music on phonological short-term memory. *The Quarterly Journal of Experimental Psychology Section A*, 41(1), 107-122.
12. Schellenberg, E. G. (2006). Long-term positive associations between music lessons and IQ. *Journal of Educational Psychology*, 98(2), 457.
13. Shih, Y., Huang, R., & Chiang, H. (2012). Background music: Effects on attention performance. *Work*, 42(4), 573-578.
14. Swaminathan, S., Schellenberg, E. G., & Venkatesan, K. (2018). Explaining the association between music training and reading in adults. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 44(6), 992.
15. Thompson, W. F., Schellenberg, E. G., & Husain, G. (2001). Arousal, mood, and the Mozart effect. *Psychological Science*, 12(3), 248-251.