The Effect of Study Music Tempo on Memory

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Background

- This study aims to examine the impact of study music tempo (BPM) on memory.
- Participants who listen to calm music outperform participants listening to aggressive music.[1]
- Overall, music appears to slightly improve behavioral or emotional activity and to slightly diminish cognitive behavior.[2]
- Tasks are more challenging when they compete in the same brain hemisphere than when they engage both hemispheres. Visual and Auditory processed in different hemispheres.[3]
- This study investigates if BPM affects retained memory from different learning formats (reading or verbal).

Hypotheses

- H1: Participants in the "fast music" (> 80 BPM) condition will retain less information than those in the "slow music" condition (< 80 BPM).
- H2: Scores on the reading task will be higher than scores on the verbal comprehension task.
- H3: Tempo and format will interact, such that better performance with slow BPM compared to fast BPM will be stronger in the reading format than the verbal format.

Design and Participants

- 80 undergraduate participants (54 Women, 25 Men, 1 NB; *M*age = 20.01, *SD*age = 2.68)
- 2 (Tempo: Fast vs Slow) x 2 (Learning Format: Reading vs Verbal) independent groups factorial design
- DV: Memory Retention

Materials

- "Slow" Mozart Piano Sonata Playlist (IV-1: Slow Tempo, < 80 BPM)
- "Fast" Mozart Piano Sonata Playlist (IV-1: Fast Tempo, > 80 BPM)
- Sample SAT reading comprehension excerpt (IV-2: Reading Condition)
- Audio recording of Sample SAT reading comprehension excerpt (IV-2: Verbal Condition)
- Sample SAT 10-item reading comprehension questionnaire (DV)

Procedure

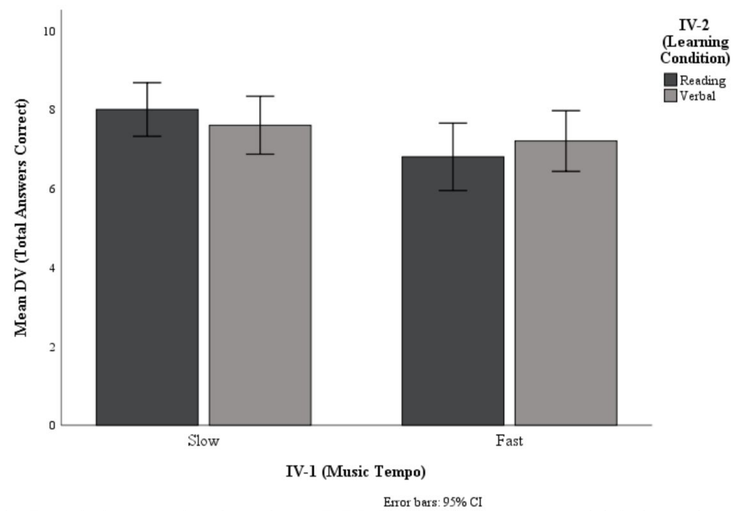
- Participants were randomly assigned to groups of either slow or fast music and verbal (participants listened to recording) or reading conditions (participants read silently).
- Then they completed the memory test.

Results

Mean and SD by Condition

IV-1 (Music Tempo)	IV-2 (Learning Condition)	Mean	Std. Deviation	N
Slow	Reading	8.00	1.451	20
	Verbal	7.60	1.569	20
	Total	7.80	1.506	40
Fast	Reading	6.80	1.824	20
	Verbal	7.20	1.642	20
	Total	7.00	1.725	40
Total	Reading	7.40	1.736	40
	Verbal	7.40	1.598	40
	Total	7.40	1.658	80

Effect of Music Tempo and Learning Condition on Mean Number of Correct Answers



- H1: Participants in the slow BPM condition scored higher than those in the fast BPM condition, $F(1.76) = 4.84$, $p = 0.03$, $n_p^2 = 0.06$.
- H2: No difference between reading and verbal formats, $F(1.76) = 0.00$, $p = 1.00$, $n_p^2 = 0.00$.
- H3: Interaction was not significant, $F(1.76) = 1.21$, $p = 0.28$, $n_p^2 = 0.02$.

Discussion

- Slow tempo music leads to better memory retention, which could positively impact memory retention for college students.
- Results for the difference between information format were not statistically significant, but greater differences in reading condition retention could prompt further research in the interaction between brain hemispheres when simultaneously processing visual and auditory information.
- Results are not representative enough to be generalizable. (reduced size)
- Further research could examine different genres of music or eras of classical music.
- Statistically significant results demonstrating tempo as having an effect on memory are important for future research in memory across several disciplines, primarily education.

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