

More than sound:

The effects of music as a cue for autobiographical memory

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Analyses

Background

Our senses can cue vivid memories from our past. There has been significant research into the differences between the effectiveness of different sensory cues. For example, music has been shown to be especially suited for evoking vivid memories. The current work draws upon previous research into Musically-Evoked Autobiographical Memories (Janata et al., 2007; Belfi et al., 2016; Cuddy et al., 2017).

The present research aims to collect data from a group of individuals that has a specific shared memory that can be measured for accuracy. **I predict that participants receiving an audio cue will have a more vivid and more accurate memory of the event than those receiving a visual cue.**

Experimental Design

Participants answered a series of pretest questions. In trial one, they were presented with either a picture or an audio clip from Eastern Mennonite University's 2019 Opening Convocation or Matriculation Ceremony and asked to complete a series of 20 questions about the given event. In trial two, they were presented with the cue type and the event they had not seen yet.

Memory detail scores were based on the rate of correct test answers after each cue condition (visual and auditory). **Vividness scores** were determined before and after each trial by self-reported vividness on a scale from 1-5 (see Memory Vividness Scale). **Change in vividness** was determined by subtracting the reported vividness before the cue from the reported vividness after the trial.



The presentation of the memory tests was counterbalanced to control for order effects. Some participants had **Auditory-Convocation** and **Visual-Matriculation** while others had **Auditory-Matriculation** and **Visual-Convocation**. There were **four possible orders** for the experiment.

The mean scores of memory detail accuracy and vividness for both conditions were compared to look for **effects of cue type on both memory recall and vividness.**

A paired-samples t-test showed no difference in proportion of trials correct between picture cues ($M = 0.626$, $SD = 0.103$) and audio cues ($M = 0.593$, $SD = 0.144$), $t(22) = 0.866$, $p = 0.396$. Demonstrated in Figure 1, a 2×2 (accuracy: hit rate, false alarm rate) repeated-measures ANOVA failed to show a statistical effect of cue type on accuracy type, $F(1,22) = 1.138$, $p = 0.298$, $\eta_p^2 = .049$. **The cue type did not result in different hit rates or false alarm rates between conditions.**



Figure 1. Hit Rate, False Alarm Rate and Recall Rate for both Visual and Audio cue types. A "Hit" is a correctly recalled "Yes", and a "False Alarm" is an incorrectly recalled "Yes". Recall Rate is the rate of correct free recall answers. Comparison of memory scores within participants showed no significant difference between cue type condition.

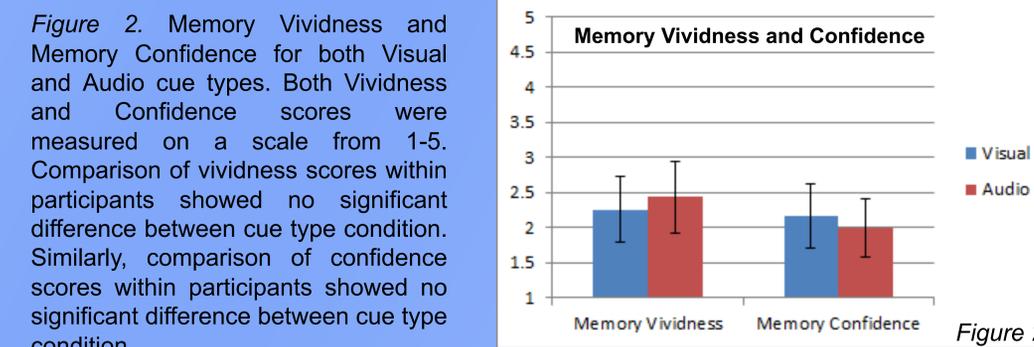
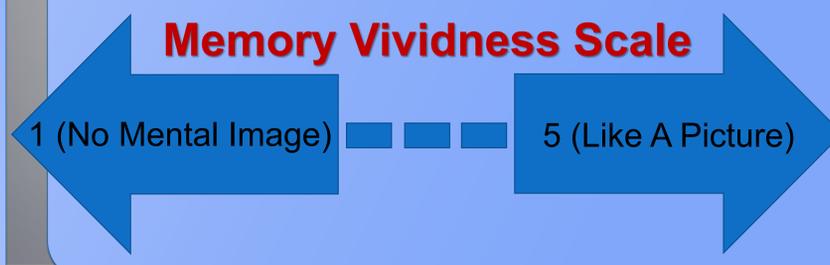


Figure 2. Memory Vividness and Memory Confidence for both Visual and Audio cue types. Both Vividness and Confidence scores were measured on a scale from 1-5. Comparison of vividness scores within participants showed no significant difference between cue type condition. Similarly, comparison of confidence scores within participants showed no significant difference between cue type condition.



A paired-samples t-test showed **no difference in reported memory vividness** between picture cues ($M = 2.261$, $SD = 0.810$) and audio cues ($M = 2.435$, $SD = 0.728$), $t(22) = 1.164$, $p = 0.257$. Similarly, a paired-samples t-test showed **no difference in memory confidence** between picture cues ($M = 2.174$, $SD = 0.778$) and audio cues ($M = 2.000$, $SD = 0.778$), $t(22) = -1.073$, $p = 0.295$.

Conclusions

- There was no statistically significant indication that cue type (audio or visual) had effect on memory accuracy or vividness
- Results failed to replicate important research on music as an autobiographical memory cue
- Measuring autobiographical memory accurately still poses a significant challenge

Future Directions

- Potential for significant contributions to therapeutic interventions for illnesses like PTSD and Alzheimer's. Music may be able to provide unique and useful ways of looking at and working with lost or broken memories in a therapeutic setting.
- Future research on autobiographical memory should include the variable of emotion in addition to vividness and accuracy