Neural Correlates of Autobiographically Salient Music Listening in Healthy Older Adults

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Introduction

Music listening has been shown to induce mood changes[1] and facilitate memory retrieval in people with dementia[2].

Current research posits that autobiographically salient (ABS) music, music that is linked to one's personal past (i.e., people, locations, and events), can trigger a memory retrieval process[3]. However, the time course of this retrieval has yet to be documented.

Through behavioural and electrophysiological methods, we examined the time course of retrieval processes for identifying ABS music and tested whether it differs from identifying familiar (FAM) and unfamiliar (UFAM) music.

Objective 1: Evaluate reaction time (RT) when older adults listen to ABS, FAM, and UFAM music

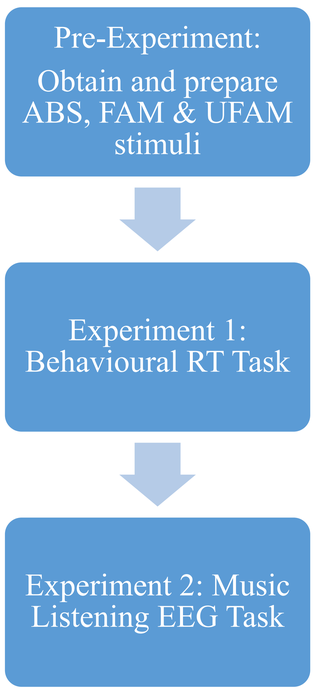
Objective 2: Investigate event related potentials (ERPs) during a music listening task of ABS, FAM and UFAM music in older adults

Methods

Table 1. Participant Demographics (n=18)

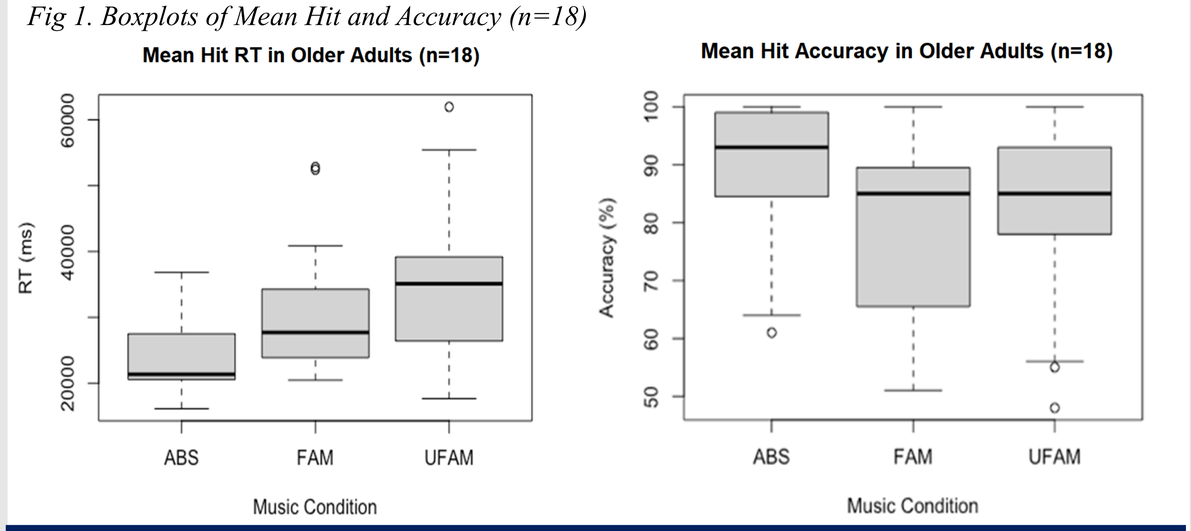
Age (years)	69 ± 6.1 (61-79)
Sex	10 females 8 males
MoCA total score	28.2 ± 0.94 (27-30)

All participants were generally healthy non-musicians with normal hearing thresholds on audiograms (<25 db HL, 250-4,000 Hz)



Reaction Time Results

Fig 1. Boxplots of Mean Hit and Accuracy (n=18)



ERP Results

Fig 2a. Grand Average ERPs Across All Music Conditions in Older Adults (n=18): Channel P3

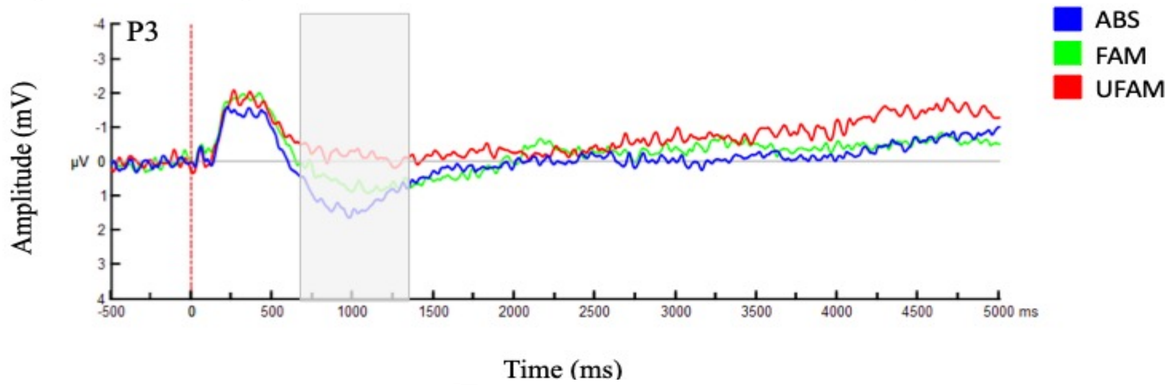


Fig 2b. Topographical Maps at Peak Latency (753 ms)

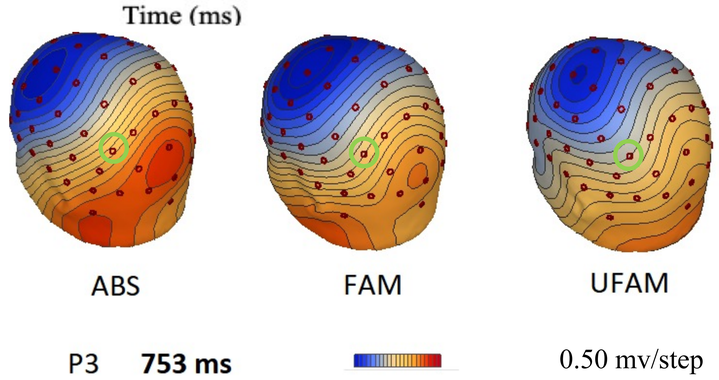


Fig 3a. Channel FC4

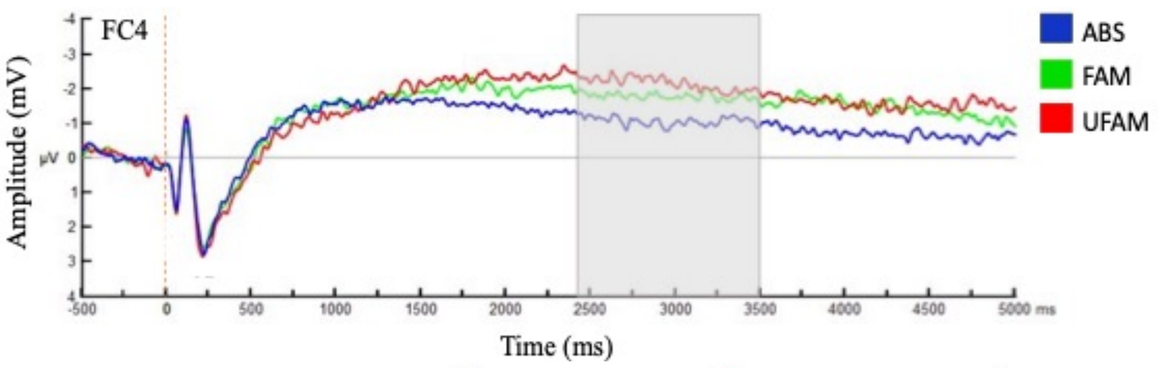
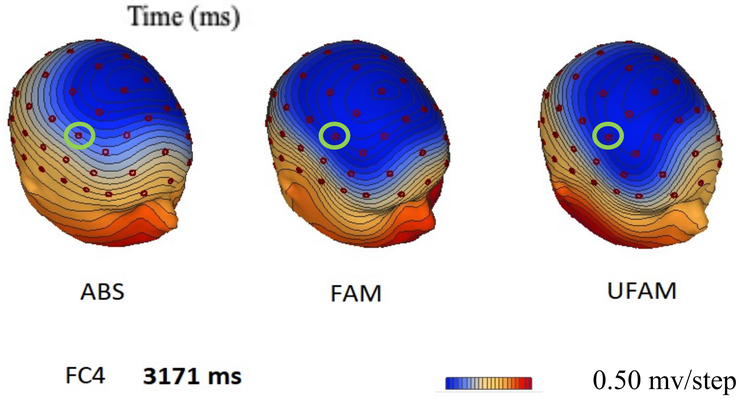


Fig 3b. Topographical Maps at Peak Latency (3171 ms)



Discussion

Experiment 1:
The results suggest that ABS music holds an advantage in eliciting rapid and accurate behavioural responses in older adults.

Experiment 2:
The ERP results indicate that the time course of recollection for ABS music is distinguished from FAM music from 527 ms post-stimulus onset.

The early time window over the left parietal area may indicate memory retrieval, such as the Late Positivity Complex (LPC)[4].

The later time window over right fronto-central area may reflect reward, speech, and/or memory associated with reminiscence.

Together, the behavioural and ERP findings are consistent with an early retrieval process followed by integration of memories and associations, reflection, or emotional processing, resulting in extended cognitive engagement.

The study results can inform methodology regarding length of music stimuli, particularly for temporal-based techniques.

Next steps: Complete analysis of n=40 participants

References

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