

# Neuroelectric Correlates of Autobiographically Salient Music Listening in Healthy Older Adults: An ERP Study

Veronica Vuong<sup>1,2,3</sup>, Michael Thaut<sup>1,2,\*</sup>, Claude Alain<sup>1,2,3,4,\*</sup>

<sup>1</sup> Institute of Medical Science, Faculty of Medicine, University of Toronto

<sup>2</sup> Music and Health Research Collaboratory, Faculty of Music, University of Toronto

<sup>3</sup> Rotman Research Institute, Baycrest Health Science

<sup>4</sup> Department of Psychology, University of Toronto

\* Co-Supervisors



## Introduction

- Autobiographically salient (ABS) music, associated to one's personal past (i.e., people, locations, and events) is posited to be more efficient at engaging memory processes compared to familiar (FAM) music<sup>1</sup>
- However, behavioural and neuroelectric studies that distinguish between these two memory types are lacking

## Objectives

- Using a music listening task of ABS, FAM, and unfamiliar (UFAM) music in healthy older adults, we sought to:
- Study 1: Evaluate reaction time (RT) and accuracy
- Study 2: Use electroencephalography (EEG) to examine differences in neuroelectric activity

## Methods

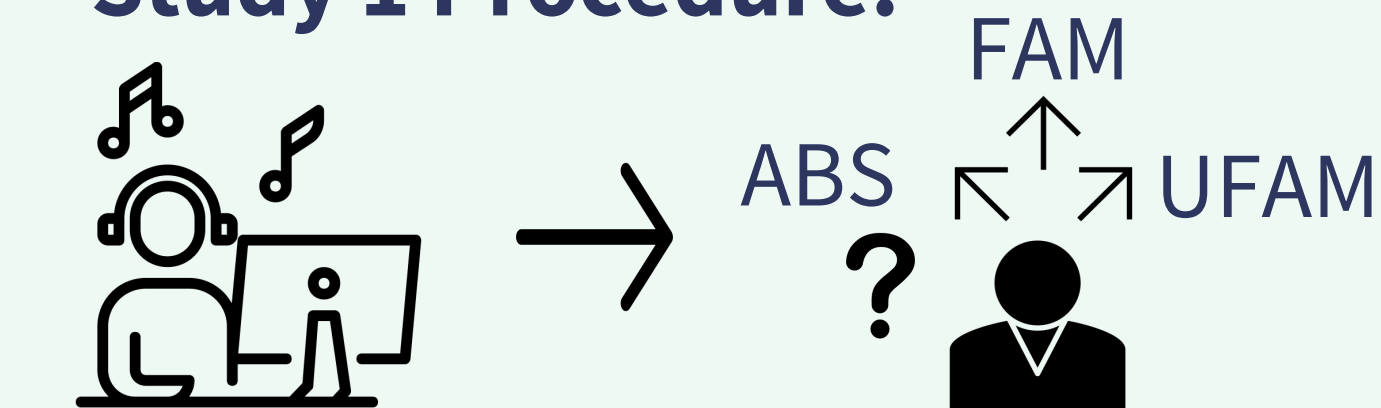
### Stimuli:

- Individualized ABS vocal songs (n=15/participant), in English
- For each ABS song, a FAM and UFAM song were selected/matched in genre and release year ( $\pm 5$  yrs)

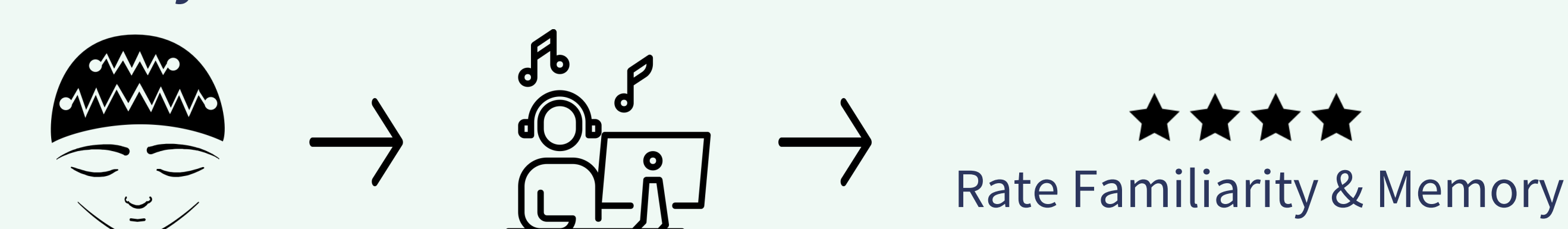
### Participants:

- Healthy, non-musician, older adults (60+) with normal hearing

### Study 1 Procedure:



### Study 2 Procedure:



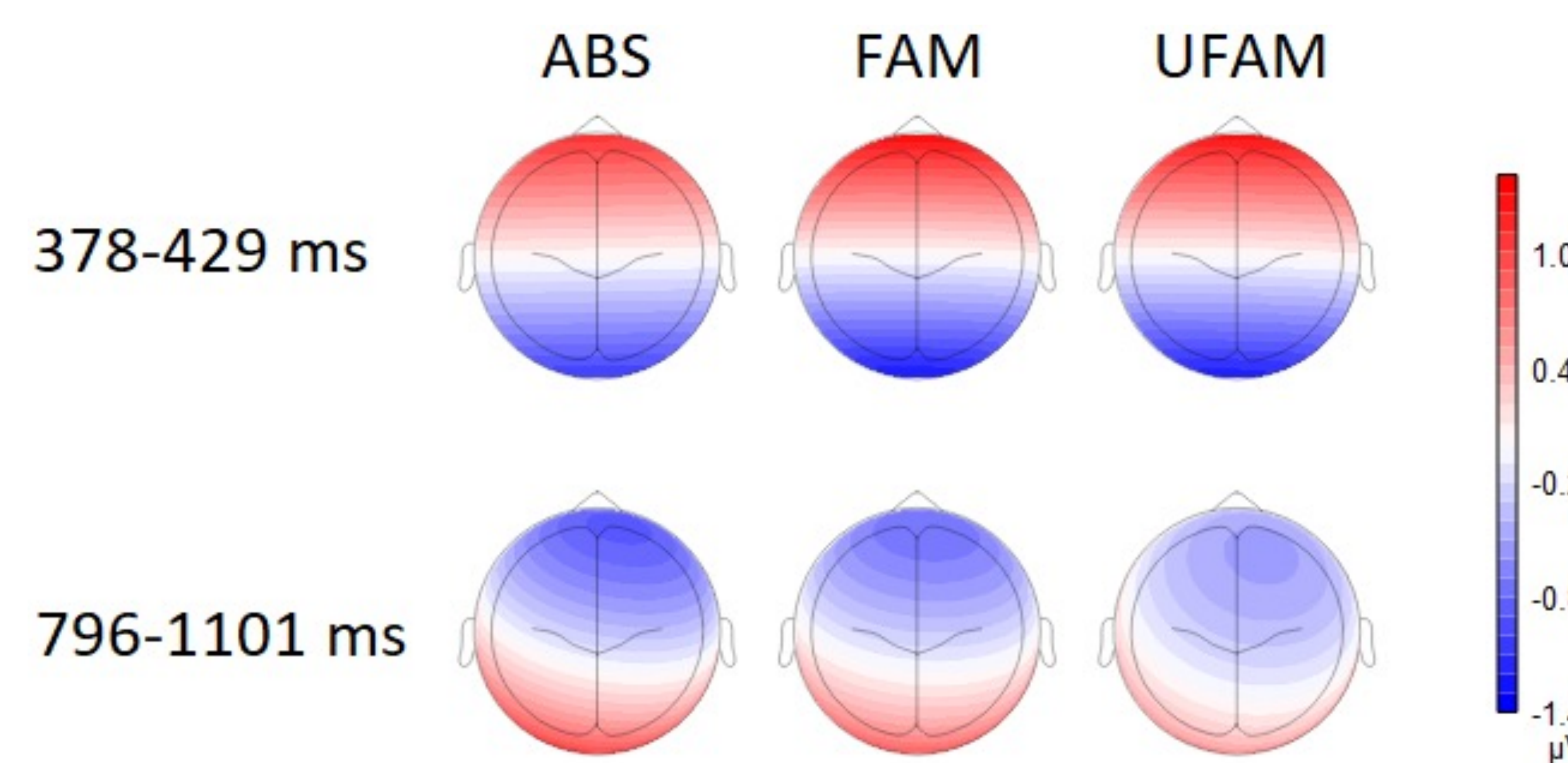
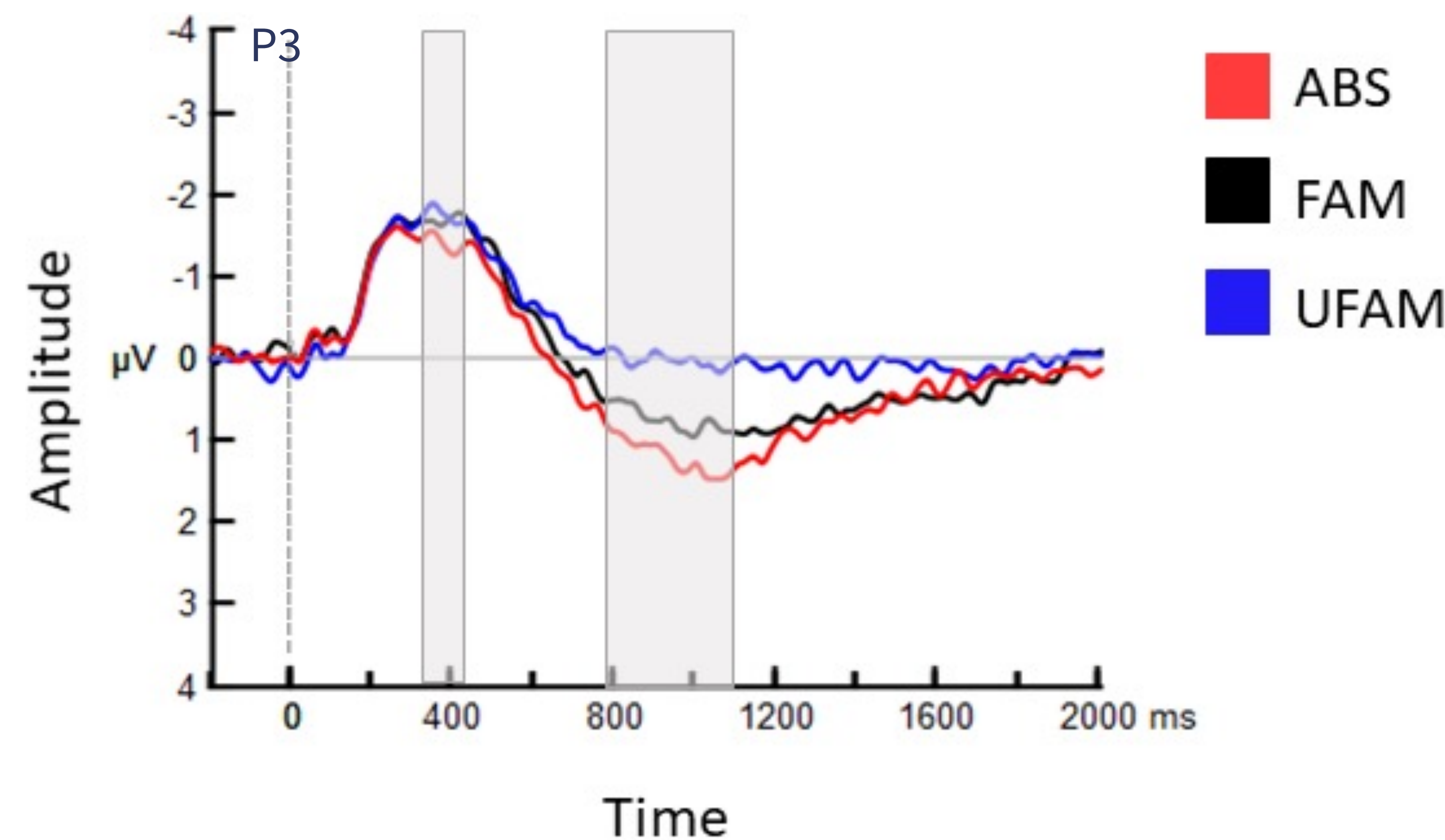
**Music that holds personal meaning (autobiographically salient) triggers neural responses that are:**

- 1) More positive in ERP amplitude**
- 2) Reminiscent of the Late Positive Complex (LPC), an index of episodic recollection**
- 3) Distinct from familiar music**

### Study 1 Results (n = 33, 71 $\pm$ 6.8 yrs, 61-86, 18 F):

Music Condition	Mean Hit RT (Seconds) $\pm$ SD	Mean Hit Accuracy (%) $\pm$ SD
ABS	2.09 $\pm$ 0.09	0.95 $\pm$ 0.17
FAM	2.88 $\pm$ 1.33	0.78 $\pm$ 0.15
UFAM	3.85 $\pm$ 1.72	0.80 $\pm$ 0.14

### Study 2 Results (n = 37, 70.4 $\pm$ 5.8 yrs, 61-86, 18 F):



## Conclusion

- In Study 1, older adults were fastest and most accurate in identifying ABS music compared to FAM and UFAM music
- In Study 2, cluster-based statistics identified two significant clusters over left centro-parietal electrodes with a more positive ERP for ABS than FAM music
- Cluster 1 (peak latency = 406 ms) may reflect familiarity. Lifetime exposure has been found to modulate this response in a graded fashion, such that stimuli that were more frequently encountered resulted in more positive ERP amplitude than those less frequently encountered<sup>2,3</sup>
- Cluster 2 (peak latency = 828 ms) may reflect recollection and retrieval of episodic details (i.e., the Late Positive Complex (LPC)<sup>4</sup>), that may occur after participants recognize personally meaningful music associated with their past
- Taken together, the RT and ERP results indicate that ABS music is associated with faster and stronger-memory related activity that is distinct from FAM music
- The findings offer methodological insight into the segment length for effective memory retrieval, particularly in temporal-based techniques and provide important implications for music-based therapeutic interventions targeting memory

## Future Directions

- Source analyses
- Time-frequency analyses
- Temporal response function analyses
- The effect of an ABS music listening intervention

## References

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CANADA



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