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## **NEUROPHYSIOLOGICAL EXAMINATION OF THE AFFECT–INTEGRATION– MOTIVATION FRAMEWORK OF DECISION-MAKING IN THE AGING BRAIN**

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**Background:** The Affect–Integration–Motivation (AIM) framework was proposed to clarify how brain circuits that support decision-making are altered by aging (Samanez-Larkin & Knutson, 2015). According to this framework, choices are preceded by affective, integrative, and motivational processes, which may all be affected by aging.

**Aims:** The Monetary Incentive Delay (MID) task allows tapping into several mechanisms proposed by the AIM framework, and the present study aimed to explore the temporal resolution of the EEG to find the neural correlates of age differences in such mechanisms, including gain/loss anticipation, value integration, motivational processes underlying motor choice, as well as processing of positive/negative rewards.

**Method:** The electrophysiological data were recorded from 77 participants (20-80 years old), and we analyzed the Cue-P3, Contingent Negative Variation, target-P3, Feedback-related Negativity, and the Feedback-P3.

**Preliminary results:** Our results were largely in line with the mechanisms proposed in the AIM framework. Specifically, we found that aging compromises the voluntary allocation of attention to cues anticipating loss while preserving the processing of cues anticipating gains. The integration processes, assessed through the CNV, appear to be the most affected by aging since older adults similarly processed cues anticipating gain, loss, and neutral trials during a time window in which alerting properties of the cues should elicit the engagement of effortful resources to future motor responses. Finally, groups did not differ in the neural processing of target that elicited the motor responses to gain, loss, and neutral trials, suggesting motivational processes related to approach gains and avoid losses are preserved with aging. Finally, the results of the feedback processing are in line with the results of the anticipation processing, showing that aging preserves the processing of gains while affecting the processing of losses.

**Keywords:** Aging, Economic Decision-making, Reward Anticipation; Reward Processing, ERPs

### **Publications:**

Macedo, I., Fernandes, C., Garcez, H., Gonçalves, A. R., Barbosa, F., & Marques-Teixeira, J. (2020, november). *The time course of decision-making: contribution of the electrophysiological version of the monetary incentive delay (e-MID) task*. Oral communication presented at 1st Online Congress of Neuromatch Academy (online).

Fernandes, C., Macedo, I., Barbosa, F. & Marques-Teixeira, J. (2021, september). *Temporal dynamics of decision-making across lifespan: an ERP study of rewards*

*anticipation and processing*. Oral communication presented at XII Congreso de la Sociedad Española de Psicofisiología y Neurociencia Cognitiva y Afectiva (SEPNECA; Online).

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Fernandes, C., Macedo, I., Barbosa, F. & Marques-Teixeira, J. (2021). *Temporal dynamics of decision-making: an erp study of rewards anticipation and processing*. In M. Reimann & O. Schilke (Eds.) 2021 NeuroPsychoEconomics Conference Proceedings (pp. 47). Luedenscheid, Germany.

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