Contribution ID: **822** Type: **Talk in simposio**

Shared spectral fingerprints of temporal memory precision and representation of the temporal structure of complex narratives

Thursday, September 11, 2025 11:39 AM (17 minutes)

The ability to organize events in time is a hallmark of episodic memory. While fMRI studies have linked the entorhinal-hippocampal network to temporal judgments and event structure representation, less is known about the broader neural mechanisms supporting these abilities. This EEG study investigated whether temporal memory precision and temporal representation of event structure are related, overlap in time, and involve brain areas beyond the medial temporal lobe. Twenty participants encoded a movie and later placed short video clips on a horizontal timeline representing the movie's duration. This task provided behavioral measures of temporal precision and subjective temporal distance between clips. Using multivariate pattern analysis (MVPA) on time-frequency EEG data, we identified an electrophysiological signature of temporal precision in the high beta/low gamma band (28–40 Hz) during timeline placement. Representational similarity analysis (RSA) showed that neural similarity across scalp activity patterns mirrored the perceived temporal distance between movie segments. Notably, both effects occurred in the same time and frequency window. Moreover, temporal precision and event structure representation were positively correlated, suggesting that better accuracy is associated with a more structured temporal memory. These findings demonstrate that high beta/low gamma oscillations not only track temporal precision but also encode the mnemonic structure of complex events. By linking these two processes, our results clarify how the brain organizes episodic memories in time, extending our understanding beyond the hippocampal formation and shedding light on how experiences become "infused with time".

If you're submitting a symposium talk, what's the symposium title?

Neural signatures of complex and real-life memories

If you're submitting a symposium, or a talk that is part of a symposium, is this a junior symposium?

No

Primary author: Dr FRISONI, Matteo (Università di Bologna)

Presenter: Dr FRISONI, Matteo (Università di Bologna)

Session Classification: Neural signatures of complex and real-life memories

Track Classification: Memory