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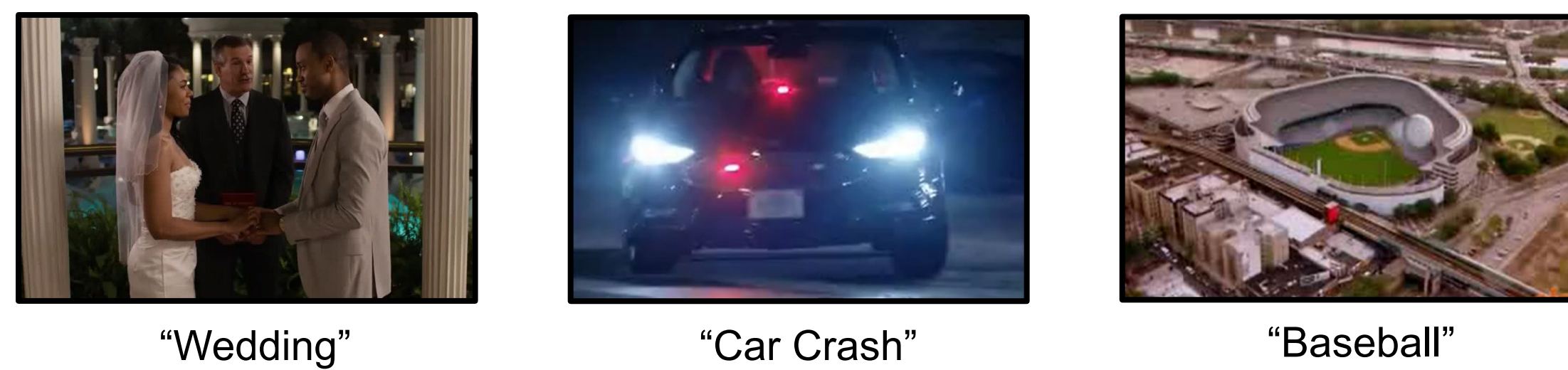
Introduction

- Naturalistic episodes** include complex narrative, emotional, and social information
- Medial-temporal** and **cortical** regions have been implicated in narrative comprehension, episodic memory, and emotional memory [1]
- Recent studies have analyzed **multivariate patterns** in the brain to identify emotional states [2]
- Past studies have focused on **classifying discrete emotions** [3,4] or manipulating **dimensions of emotional pictures** [5]

How does the emotional content of narrative episodes relate to neural representations?

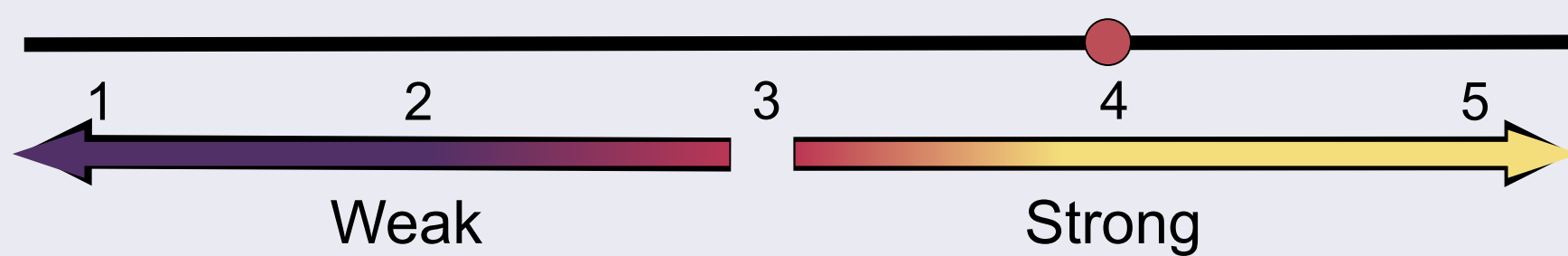
Method

fMRI Sample: 24 participants viewed 70 narrative videos (mean duration = 30s) in the scanner

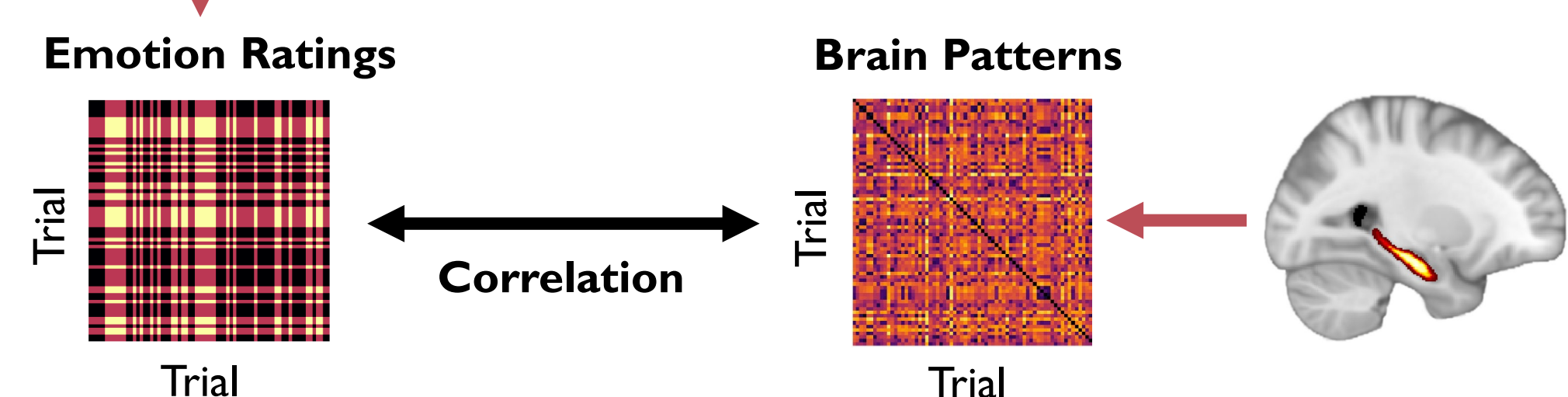


MTurk Sample: 1,907 participants each viewed one video and rated emotional **valence** (+/-) and **intensity** (strength)

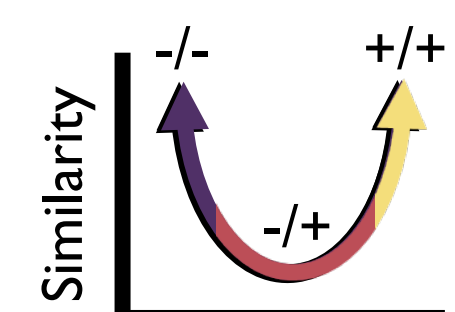
How **strong** were the emotions you felt while watching the video?



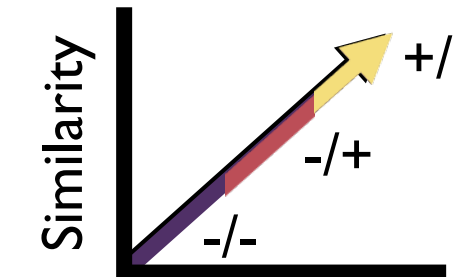
Extract trial-by-trial neural activity patterns & correlate with models based on emotion ratings



Q1: Does the brain discriminate between positive/negative or strong/weak emotions?

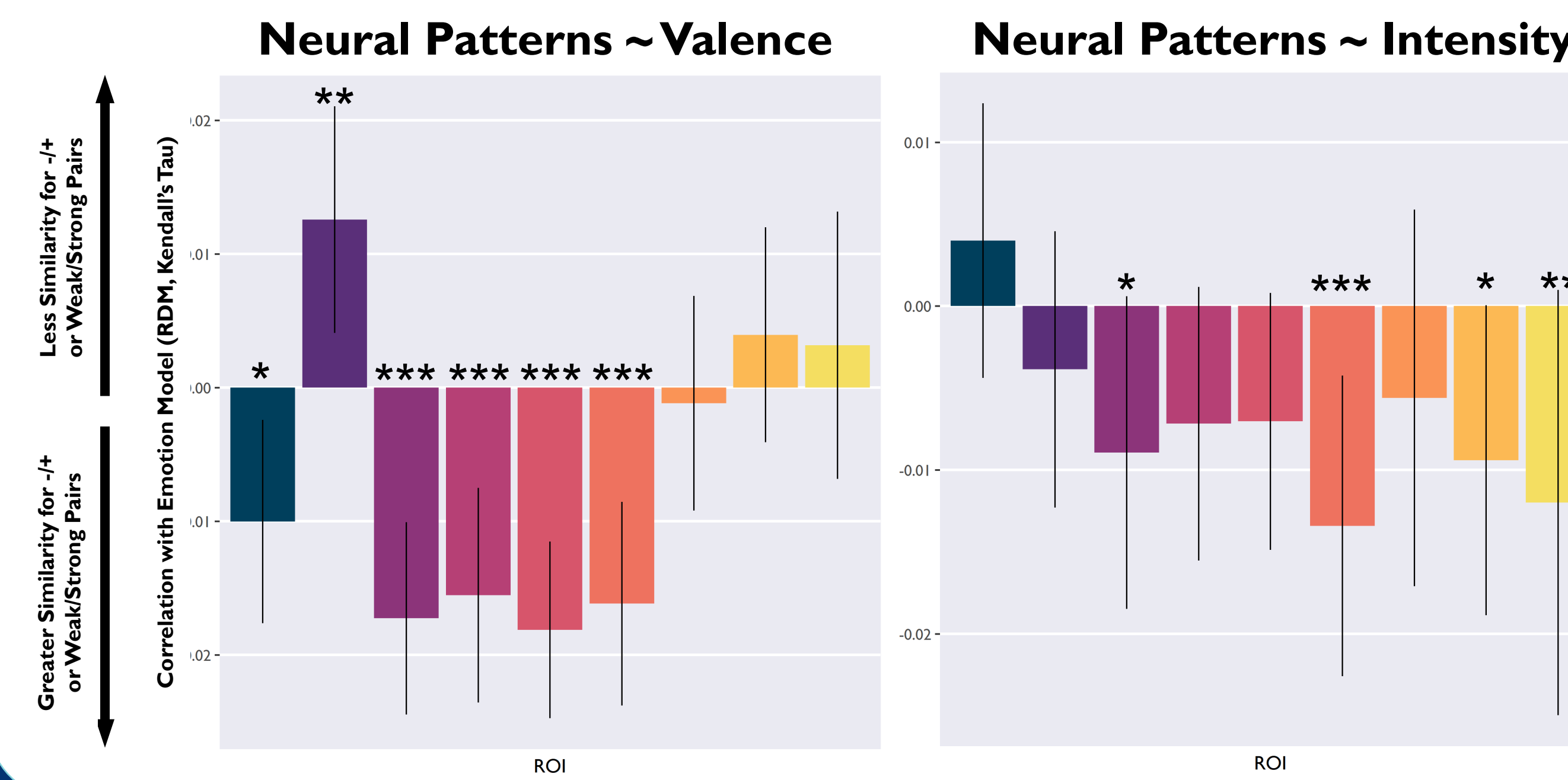


Q2: How are representations of events modulated by emotional content?

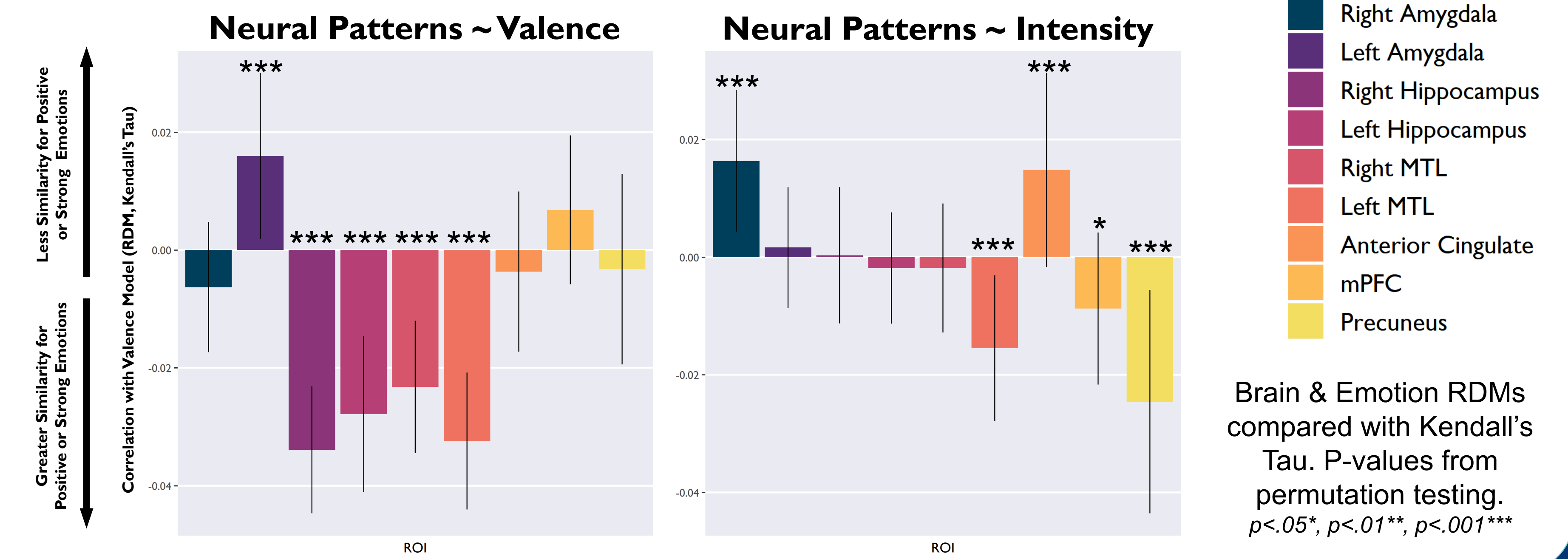


Relating Neural Patterns and Emotional Models

Q1: Which ROIs discriminate between +/- or weak/strong emotions?

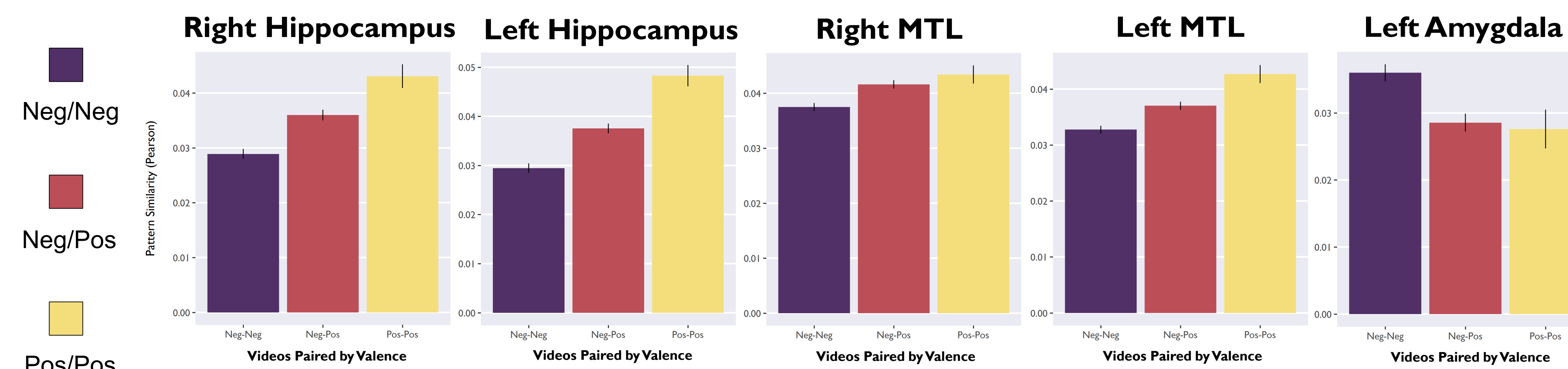


Q2: Where are representations of events modulated by emotional content?



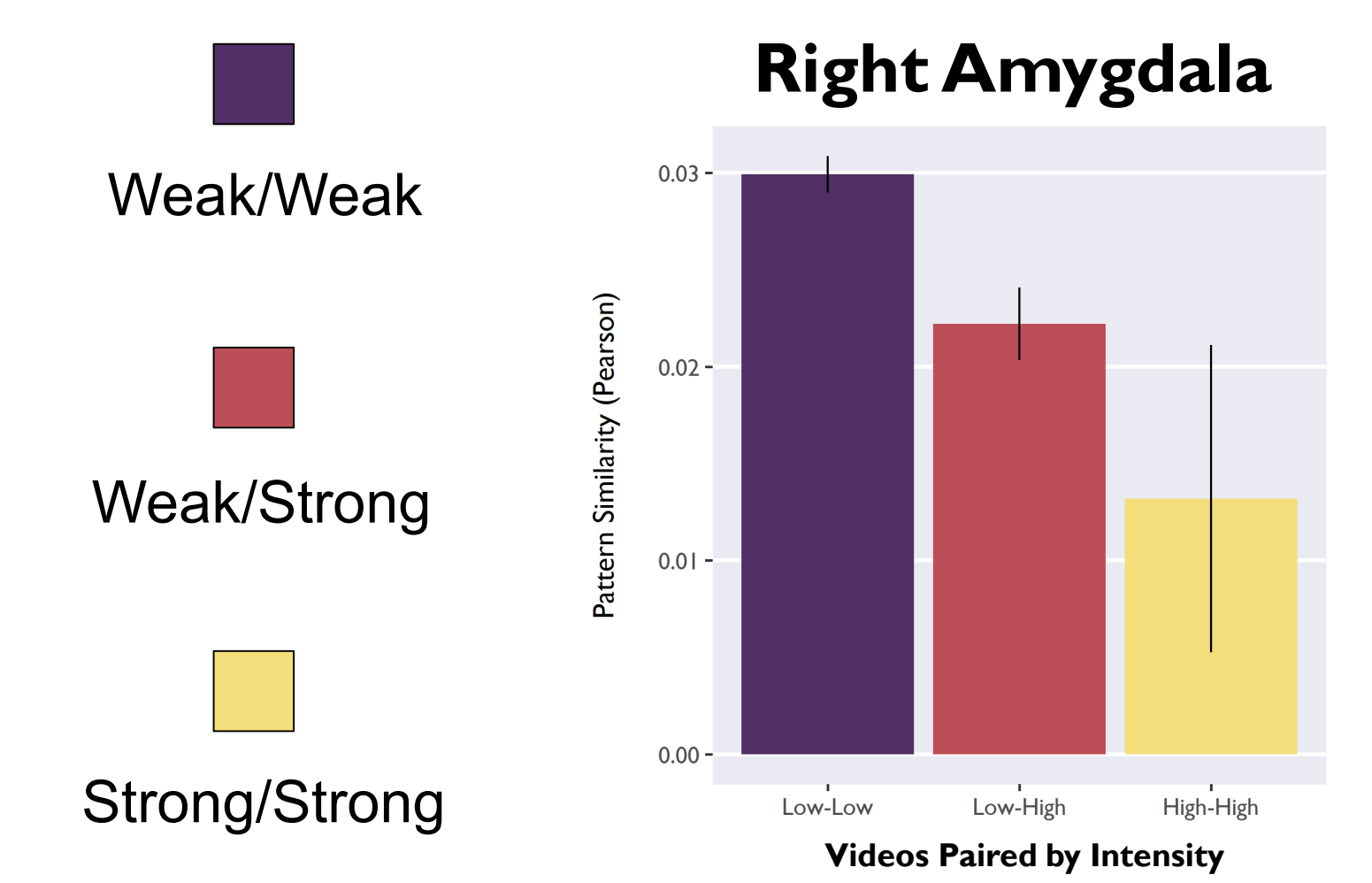
Brain & Emotion RDMs compared with Kendall's Tau. P-values from permutation testing. $p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

Valence Modulates Event Representations



Events with **negative emotional content** have more **distinct representations** in Hippocampus/MTL, but more **similar representations** in Left Amygdala

Emotional Intensity



Events with **intense emotions** have more **distinct representations** in Right Amygdala

Discussion

- Q1:** Several brain regions are sensitive to differences in emotional valence and intensity.
 - However, in hippocampus, MTL, and cortical ROIs, strong/weak or positive/negative video pairs have more similar representations
- Q2:** Neural representations of naturalistic events are modulated by emotional content.
 - Videos with **negative emotional content** have more **distinct representations** in hippocampus/MTL, which may support pattern separation
 - Videos with **negative emotional content** have more **similar representations** in left amygdala, which may reflect a valence bias
 - Videos that elicit more **intense emotions** have more **distinct representations** in right amygdala → strong emotions may increase differentiation
- Future Directions:** Test alternative emotion models (e.g., categorical), explore **temporal dynamics**, or relate to **subsequent memory**

Activity patterns in the amygdala, hippocampus, and surrounding MTL regions are sensitive to the emotional content of episodes

1. Baldassano, C., Chen, J., Zadbood, A., Pillow, J. W., Hasson, U., & Norman, K. A. (2017). Discovering Event Structure in Continuous Narrative Perception and Memory. *Neuron*, 95(3), 709-721.e5.
 2. Kragel, P. A., & LaBar, K. S. (2016). Decoding the Nature of Emotion in the Brain. *Trends in Cognitive Sciences*, 20(6), 444-455.
 3. Kragel, P. A., Knodt, A. R., Hariri, A. R., & LaBar, K. S. (2016). Decoding Spontaneous Emotional States in the Human Brain. *PLoS Biology*, 14(9).
 4. Saarimäki, H., Gotsopoulos, A., Jääskeläinen, I. P., Lampinen, J., Vuilleumier, P., Hari, R., ... Nummenmaa, L. (2016). Discrete Neural Signatures of Basic Emotions. *Cerebral Cortex*, 26(6), 2563-2573.
 5. Bush, K. A., Privratsky, A., Gardner, J., Zielinski, M. J., & Kilts, C. D. (2018). Common Functional Brain States Encode both Perceived Emotion and the Psychophysiological Response to Affective Stimuli. *Scientific Reports*, 8(1), 1-10.