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The structure of event representations: behavioral, imaging, and computational investigations

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Abstract: Event segmentation is often thought to rely on the identification of points in a sequence where there is relative uncertainty about what will happen next. We exposed participants to sequences of stimuli that had temporal structure but no variability in predictive uncertainty: each stimulus could be followed by four others with equal probability. We found reliable parsing between groups of stimuli that were preceded and followed by overlapping sets of items, suggesting that people are sensitive to temporal statistics beyond predictive uncertainty. We hypothesized that this reflects learning of temporal category structure, with items that occur in overlapping temporal contexts represented as belonging to the same category. Supporting this idea we found that, following exposure to the same structured sequence, participants sorted items based on their temporal contexts. To elucidate the mechanisms and representations supporting this behavior we consider alternative computational models of temporal structure learning and present preliminary fMRI results.