EVENT SEGMENTATION DISTORTS SUBJECTIVE TIME PERCEPTION BETWEEN ITEMS FOR WITHIN AND ACROSS EVENTS

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Background: We continuously receive streams of sensory information, yet our minds organize them into discrete, meaningful events. When listening to speech in a familiar language, for example, we effortlessly perceive boundaries between words, even though the acoustic signal itself is continuous. One influential idea suggests that these event boundaries emerge from the temporal structure of experience: Items that frequently occur together become more closely represented in the brain than those across boundaries. However, it remains unclear how this process of event segmentation shapes subjective perception, such as how we experience time.

Aims: We hypothesized that segmenting a continuous stream into events distorts subjective time perception, that is, pauses between events might feel longer or shorter than they are. We tested, whether such distortions occur, whether they generalize across different pause durations, and whether their magnitude relates to behavioral measures of event segmentation.

Methods: The experiment consisted of two phases: In the exposure phase, participants listened to continuous streams of syllables that were either structured (containing statistical regularities that defined previously learned “words”) or random (lacking structure). In the pause adjustment (PA) phase, they then heard short excerpts from these structured or random streams and adjusted the duration of pauses between syllable pairs until the intervals felt equally long, allowing us to measure perceptual distortions while minimizing memory biases.

Results: Event structure had a clear and systematic effect on subjective time perception. In structured streams, participants consistently perceived between-word pauses as longer than within-word pauses, even though their physical durations were identical. In random streams, no such difference emerged. This distortion remained stable across all tested pause durations, indicating that it generalized across temporal scales. Interestingly, the size of this perceptual bias did not correlate with reaction-time measures of segmentation strength, suggesting that temporal distortion arise from mechanisms distinct from those driving explicit segmentation behavior.

Conclusions: These findings demonstrate that event segmentation systematically warps our sense of time: Pauses at event boundaries feel longer, while pauses within events feel shorter. This robust and scale-invariant bias reveals a tight link between how the brain organizes continuous experience into events and how time is subjectively perceived.

Keywords: Event segmentation, Time perception, Statistical learning

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