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Identifying auditory events at a cocktail party: Principles of temporal integration and stream segregation

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The question of how sequential sound elements are grouped into meaningful percepts has been within the focus of researchers for decades. This talk takes a new perspective by addressing how within-stream temporal integration occurs in the context of a cocktail party. In a noisy environment, the ability to identify specific events depends upon multiple processes: the overall segregation of sounds into streams as well as the within-stream integration of sequential sounds into meaningful units. This talk presents two studies that address the interaction of these two complex processes. Event-related potentials were used to determine effects of timing (Experiment 1) and of attention (Experiment 2) on the perception of within-stream sound events in multi-stream environments. Experiment 1 shows that within-stream temporal integration of sequential elements uses previously segregated streams as input. Experiment 2 shows that attention can override stimulus-driven processing biases to facilitate task demands. These results demonstrate different time courses for segregation of sounds into separate streams and for integration of sound elements into within-stream units. Thus, the findings suggest that different neural mechanisms interact in the perceptual organization of sequential sound elements.