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Neural Delay & Desynchronization problems for the Simple Brain Time Theory

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Abstract

The brain time theory cannot account for an adaptive trade-off between, the speed of perceptual availability and the accuracy of temporal binding. It argues that the ordinality of neural processing of sensory features is isomorphic to the ordinality of our conscious representations of them. The theory thus proposes a simple solution to the temporal aspects of the binding problem i.e., how sensory features are integrated into coherent percepts when these features change over time and are processed at different times and speeds in the brain. However, this solution is unable to account for the trade-off set out here: either it errs on one side of the trade-off, or it gets the trade-off right at the cost of violating its two central theses. This is a problem as a theory of time perception must get this trade-off right to be a satisfactory solution to the temporal aspects of the binding problem.