Post-interval evoked N1-P2 amplitude reflects continuation of timing following CNV resolution

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Abstract

Event-related potentials such as the contingent negative variation (CNV) and N1-P2 complex can be used to study the temporal flow of information and distinguish among different timing models (e.g., pacemaker/accumulator vs. coincidence detection). For example, in pacemaker/accumulator models the hypothesized link between the CNV and the clock reading suggests that the accumulator quickly returns to its base level upon resolution of the CNV. Such resolution, however, should impair the system in its timing of any subsequent events. We present data from a 'standard–comparison' timing procedure focusing on the N1-P2 complex evoked by the comparison stimuli. Based on the regularities in N1-P2 amplitude as a function of the duration of 'shorter' and 'longer' comparison stimuli, we argue that accurate temporal comparisons can be made even after the resolution of the CNV. These findings suggest that temporal information is used in at least two partly independent processes. One that drives the CNV and prepares the system for a change of response (i.e., from a default 'shorter' response to a 'longer' response). This CNV-related process resolves after the decision is made. However, there is still an ongoing timing process (perhaps sub-served by a coincidence-detection mechanism) that reflects the interval between stimulus onset and current time, which is used to give rise to the full range of the N1-P2 complex.

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