# The N-40: an electrophysiological marker of decision-making

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**Abstract**

After Laplacian transformation, a fronto-central phasic negative wave develops, before the build-up of the motor command, over the medial frontal cortex (including supplementary motor areas). It peaks about 40 ms before electromyographical onset and was then called "N-40". The N-40 is present when a response choice has to be performed and absent when no choice is required. Therefore, the N-40 has been assumed to be related to decisional processes. It is classically considered that stimulus-response (S-R) mapping affects decisional processes: the decision being more complex for incongruent than for congruent mapping. In the present study, we examined the sensitivity of the N-40 to the demands put on the decisional processes Therefore, subjects performed in a choice RT task where S-R mapping (congruent vs. incongruent) was manipulated Results revealed, a congruence effect on the N-40: it was larger on incongruent (more demanding) than on congruent (less demanding) S-R associations. This argument strengthens the idea that the N-40 reflects decision processes. As such it can be used to clarify the mechanisms underlying decision-making.

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