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# Electroencephalographic indicators of response inhibition: Where to look?

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## Abstract

Response inhibition paradigms, whose most famous representatives are stop signal and go/nogo tasks, are often used to study cognitive control processes. Because of the apparent demand to suppress motor reactions, the electrophysiological responses evoked by stop and nogo trials have sometimes likewise been interpreted as indicators of inhibitory processes. Recent research as well as current theories on the families of N200- and P300-like potentials, however, suggest a richer conceptual background. We shortly review studies stressing a functional differentiation of the N200 and P300, a finding further supported by differences in generator constellations giving rise to these event-related potentials. Results from experiments manipulating stimulus probabilities and response priming will be presented showing that neither the N200 nor the P300 serve as unambiguous indicators of a proper inhibitory process. The N200 rather seems to reflect the monitoring of conflicts in information processing. Although the exact functional correspondence of the P300 is still elusive, recent findings at least support an association with evaluative processing of response alternatives. However, recently it was suggested that when subjected to time-frequency compositions, EEG responses reveal differences between go and stop trials in the beta frequency range which might more directly reflect inhibitory processing. Data from single-trial EEG of a stop signal task indeed support differential associations of delta, theta and beta frequency components with inhibition success.

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