

## Removing overlap distortion from stop-ERPs

*Bekker EM, Hoeksma MR, Talsma D\*\*/\*\*\*, Kenemans JL\**

Dept of Psychopharmacology, \*Dept of Psychonomics, Utrecht University, Utrecht, \*\*Dept of Clinical Neuropsychology, Free University, Amsterdam, \*\*\*Dept of Cognitive Neuroscience, Duke University, Durham, USA

In the stop-signal task, subjects perform a visual choice reaction time task and are instructed to withhold their response when a stop-signal, usually a tone, is presented. Since the inhibition of an ongoing motor response occurs in the absence of any overt behavior, stop-ERPs are pre-eminently suitable to clarify which brain mechanisms underlie response inhibition. Previously, successful stops have been found to elicit a larger positivity than failed stops at frontocentral electrode sites. The functional interpretation of the stop-P3 has been disputed, because stop-ERPs are distorted by overlap from ERPs elicited by preceding go-stimuli. We used the Adjar-Level2 procedure (Woldorff, 1993) to remove overlap from temporally adjacent stimuli in an auditory stop-signal task. In support of its efficacy, application of Adjar flattened S2-baselines. Furthermore, corrected S1-ERPs highly resembled overlap-free go-ERPs that corresponded in processing speed (De Jong et al., 1990; 1995). The statistical differences found when comparing S1-ERPs to go-ERPs were hypothesized to stem from stochastic non-independence, i.e. the presentation of a stop-signal affected the processing of the go-stimulus. Analysis of corrected stop-ERPs indicated that, relative to failed stops, successful stops elicited a larger N1, which reflects a more efficient processing of the stop-signal, and a larger stop-P3, which supports the notion that this component reflects inhibition. The more anterior distribution of the stop-P3 after overlap removal confirmed the presumed isolation of inhibitory processes by Adjar. Finally, as predicted by the Horse Race Model, the parietal P3 was found to peak earlier for successful stops than for failed stops.

Evelijne M. Bekker, Department of Psychopharmacology, Utrecht University, Postbus 80082, 3508 TB Utrecht, t 030-2533845, e-mail [e.m.bekker@pharm.uu.nl](mailto:e.m.bekker@pharm.uu.nl)

Poster session: Cognition & Behavioral Neuroscience on Friday June 4, 2004.