

Different Motor Inhibition Processes in Action Selection Stage: A Study with Spatial Stroop Paradigm

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Abstract : The aim of this research was to investigate whether the selection of the actions needs different inhibition processes during the response selection stage. In Experiment 1, we compared the magnitude of the Spatial Stroop effect, which occurs in response selection stage, in two motor actions (lifting vs reaching) when the participants performed both actions in the same block or in different blocks (mixed block vs. pure blocks). Within pure blocks, we obtained faster latencies when lifting actions were performed, but no differences in the magnitude of the Spatial Stroop effect were observed. Within mixed block, we obtained faster latencies as well as bigger-magnitude for Spatial Stroop effect when reaching actions were performed. We concluded that when no action selection is required (the pure blocks condition), inhibition works as a unitary system, whereas in the mixed block condition, where action selection is required, different inhibitory processes take place within a common processing stage. In Experiment 2, we investigated this common processing stage in depth by limiting participants' available resources, requiring them to engage in a concurrent auditory task within a mixed block condition. The Spatial Stroop effect interacted with Movement as it did in Experiment 1, but it did not significantly interact with available resources (Auditory task x Spatial Stroop effect x Movement interaction). Thus, we concluded that available resources are distributed equally to both inhibition processes; this reinforces the likelihood of there being a common processing stage in which the different inhibitory processes take place.

Keywords : inhibition process, motor processes, selective inhibition, dual task

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