# The role of transauricular vagus nerve stimulation in balancing autonomic systems during cognitive tasks

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**Abstract**

Transauricular vagus nerve stimulation (taVNS) is increasingly spreading both in research and clinical practice; however, literature often presents non-uniform results in various cognitive domains. We propose a procedure based on the use of taVNS to investigate its effect on executive functions, also considering the modulation of the homeostatic balance between the sympathetic and parasympathetic systems. 40 (22F) volunteers participated in two separate sessions (stimulation/sham). After baseline measurements (heart rate variability) and a preliminary stimulation phase, they performed Stroop and go/no go tasks. Throughout the procedure, cardiac activity was recorded to obtain HRV parameters in different experimental conditions. Although performance differences were not identified in the tasks, the modulation of HRV parameters during the tasks indicates how taVNS can influence the balance between the sympathetic and parasympathetic systems during the execution of cognitive tasks. This effect is likely attributed to the taVNS acting on vagal tone, supporting the parasympathetic component.



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