☆This article is part of a Special issue entitled: 'IOP 2025' published in International Journal of Psychophysiology.

doi:10.1016/j.ijpsycho.2025.113118

Talk 4
Effects of HD-tDCS over Frontal Hemisphere on Effort-Related Cardiovascular Responses☆

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This study examined the effect of frontal hemispheric asymmetry (FHA) on effort intensity. High-definition transcranial direct current stimulation (HD-tDCS) was applied to the dorsolateral prefrontal cortex (dlPFC) to manipulate FHA and assess its impact on effort-related cardiovascular responses. In total, 102 participants (65 women and 37 men) performed a reward-based mental concentration task (participants learned that they would earn CHF 9 Swiss Francs in case of task success) under right cathodal, left cathodal, or sham stimulation conditions. Cardiovascular measures, including pre-ejection period (PEP), heart rate (HR), systolic blood pressure (SBP), and diastolic blood pressure (DBP), were recorded. Right cathodal stimulation increased PEP, SBP reactivity, indicating higher effort compared to left cathodal and sham stimulation conditions in women but not in men. This effect can be attributed to the right cathodal stimulation inducing left hemispheric asymmetries, increasing the importance of success and effort during a mental concentration task of unclear difficulty. These findings highlight the sex-specific effects of FHA on effort-related cardiovascular responses, with the anticipated effects appearing in women.

☆This article is part of a Special issue entitled: 'IOP 2025' published in International Journal of Psychophysiology.

doi:10.1016/j.ijpsycho.2025.113119

Symposium 5.4:
Emotional Processes and New Issues for Pathology☆

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Emotional processes are the culmination of a large number of central and peripheral components in which the brain and body are inseparable partners. They integrate a multitude of information necessary for the appropriate development of perception, regulation and expression of emotional behaviour. The complex interaction between these components can be altered, generating inappropriate outputs that can affect emotional regulation, cognitive processes and the quality of social interactions. It therefore seems essential to rely on brain, physiological and behavioural indicators that can tell us what part emotional processes play in behavioural and neural dysfunctions. Innovative knowledge in this area would therefore be beneficial to create new based emotional procedures able to attenuate neuro-behavioural disorders. In this Symposium, we will bring multilevel approaches of emotional processes conjugating behavioural, autonomic and neurocognitive measures. In particular, selected talks will illustrate novel associations of such measures related to emotional facets observed in individuals with socio-emotional, traumatic or neural difficulties. L. De Zorzi will show how an original combination of autonomic responses supports the psychometric differentiation of alexithymia dimensions and suggests new avenues for addressing alexithymic disorders. S. Sistiaga will illustrate the way social anxiety and binge drinking interact with emotional regulation processes and draw potential preventive measures against alcohol dependence. A. Bodart, through the analysis of autonomic and interoceptive variables, will address the role of bodily information in the construction of emotional experience in a traumatic brain injury population. B. Lenne will be talking on the fine characterization of emotional reactivity to positive and negatives faces in patients with multiple sclerosis. These complementary talks will enable us to chart new orientations of interest for the emotional perception mechanisms and for the bio-marking of emotional experience and regulation.

☆This article is part of a Special issue entitled: 'IOP 2025' published in International Journal of Psychophysiology.

doi:10.1016/j.ijpsycho.2025.113120

Talk 1
Differentiating Alexithymia Dimensions: A Novel Approach Using Autonomic Measures☆

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Previous studies have examined socio-emotional difficulties in alexithymia using traditional autonomic indices. This research introduces a novel combination of autonomic responses to differentiate the dimensions of alexithymia. The study aimed to investigate emotional reactivity to social and non-social stimuli through a new combination of sympathetic and parasympathetic measures, specifically cardiac and facial thermal variations, to distinguish between cognitive and affective dimensions of alexithymia. Heart rate variability (HRV) and facial infrared thermal imaging (fITI) were recorded while participants viewed images from the International Affective Pictures System (IAPS), which included emotional (unpleasant, neutral, pleasant), social (with humans), and non-social (without humans) content. Participants were categorized as non-alexithymic (NA), cognitive alexithymic (CA), and affective alexithymic (AA) based on the Toronto Alexithymia Scale and the Bermond Vorst Alexithymia Questionnaire. They completed questionnaires on empathy, social phobia, depression, and anxiety prior to the experiment and rated the arousal and valence of the images afterward. Psychometric analysis revealed that the CA group exhibited higher scores in social phobia avoidance and depression compared to the AA group, and higher trait anxiety than both AA and NA groups. The AA group had lower personal distress empathy scores than NA and CA. Autonomically, NA participants displayed greater high-frequency HRV and lower low-frequency HRV in response to emotional social contexts, a pattern not seen in CA and AA groups. The CA group showed higher facial temperature in response to social content, while the AA group exhibited the opposite effect. This study demonstrates that cardiac and facial thermal variations can differentiate the effects of socio-emotional information between non-alexithymic and alexithymic individuals, as well as between cognitive and affective alexithymia. This research supports the psychometric differentiation of alexithymia dimensions and suggests new avenues for addressing alexithymic disorders.

☆This article is part of a Special issue entitled: 'IOP 2025' published in International Journal of Psychophysiology.

doi:10.1016/j.ijpsycho.2025.113121