

Session éthologie comparée

PUPIL RESPONSES IN REST AND REACTIVITY PARADIGMS

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Pupil size provides an index of the locus coeruleus norepinephrine (LC-NE) system functioning. LC-NE, through its tonic and phasic activity, mediates arousal and optimises behavioural performance. Adaptive gain theory, which follows a Yerkes-Dodson curve, suggests that the LC-NE system plays an important role in controlling performance. Pupil diameter during a resting paradigm would reflect LC-NE tonic component, while LC-NE phasic component could be indexed by pupil reactivity to a target stimulus. The aim of our study is to characterize the link between tonic and phasic LC-NE activity indexed by pupil diameter by comparing rest and reactivity paradigms in the same subjects.

Pupil diameter was recorded with the Tobii pro-fusion eye tracker (250Hz) in thirty adults during a 3-min resting block and a face observation paradigm. Moreover, in order to test the integrity of the autonomic nervous system loop controlling pupil diameter, we also recorded pupil light reflex. We found no relationship between parameters recorded at rest (pupil median diameter and hippus parameters) and amplitude of the pupil light reflex.

Our preliminary results do not show any differences between the parameters recorded at rest (median, amplitude, frequency) and those recorded during the reactivity paradigm (median and median amplitude of the plateau). However, an expected correlation was found between the resting median and the pre-reactivity one.

Overall, the pupil did not allow us to characterise the link between tonic and phasic LC-NE activity. However, it would be interesting to test a reactivity paradigm that would allow greater activation of the LC-NE system.