

**Title: Modelling human facial emotion recognition across normative and experimental pharmacology studies**

Prevalence of affective disorders such as major depression is on the rise and constitute a substantial personal and societal cost<sup>1</sup>. It is well-established that patients with depression exhibit abnormalities in affective processing, for example in facial emotion recognition. Intriguingly, those individuals who would eventually respond to antidepressant medication also show early signs of improvements in facial emotion recognition, making this a behavioural predictor of subsequent treatment response<sup>2-4</sup>. However, detailed underlying computational mechanisms of human facial emotion recognition, for example which components are selectively impaired by symptoms of depression and anxiety and how it responds to modulation by pharmacological agents such as selective serotonin reuptake inhibitors (SSRIs) remain unknown.

This project will seek to decompose human facial emotion recognition into its detailed subcomponents to be able to construct a formal mathematical model of affective information processing, and will seek to identify which components of this formal process are impaired by symptoms of depression and anxiety and which components may actually be preserved. We will rely on large-scale online and laboratory-based psychopharmacology studies with pupillometry (a physiological measurement with high temporal resolution relevant for perceptual neuroscience), novel methods in affective stimuli classifiers<sup>5</sup> as well as well-established computational analysis methods<sup>6</sup>.

This eclectic and interdisciplinary approach will help us to better understand mechanisms underlying human facial emotion recognition and identify potential targets for the treatment of major depressive disorder, to be tested in subsequent clinical studies.

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## References

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