

## Neurophenomenology – bringing together experience and brain activity.

### Background and Aims

How the brain produces consciousness remains poorly understood. An underexplored route to progress involves examining the coupling between two types of understanding: objective, neuroscientific research and subjective experiences<sup>1</sup>. We will deploy a recently developed qualitative method for capturing the structures and dynamics of subjective experience (micro-phenomenology (MP)<sup>2</sup>), within neuroscientific tasks, to tackle the question of what happens when we are consciously aware of something (Figure 1). Adapting developments in open-science practice, we will apply MP to classic psychophysical tasks and brain imaging to capture coupling between experience and brain activity, with a particular focus on temporal dynamics<sup>3,4</sup>.

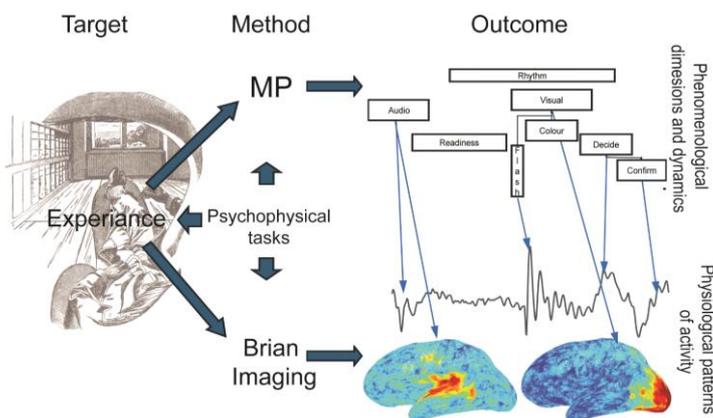


Fig. 1. Illustration of the combination of techniques we will deploy and how they are to be combined.

Several studies are planned with specific research questions, such as testing whether MP can account for statistical demonstrations of unconscious perception (e.g., TMS-induced blindsight<sup>4</sup>), thereby testing the existence of the unconscious. However, the candidate will be encouraged to develop experiments or analyses combining these techniques in application to their specific research interests, which will become options for investigation. Here we aim to develop

new methods for combining sources of information, which bridge qualitative data, about experience, and quantitative data, tracking the dynamics of brain activity

### Methods

MP (qualitative research), neuroimaging (likely EEG and MRI), or brain stimulation (TMS), psychophysics, computational modelling, and statistical analysis.

### Relevance

The project bridges interests across a range of disciplines from psychology to philosophy and neuroscience. The emphasis on the combination of sources of information is also relevant to computationally oriented disciplines.

### Training

The candidate's research activity will be based in Durham, Psychology. In addition to training in general research skills, the candidate will be trained in MP and develop a deeper understanding of neuroimaging and/or psychophysics.

### Suitable for

PhD and MSc by Research students.

### References and Further Read

- Varela, F. J. Neurophenomenology: a methodological remedy for the hard problem. *Journal of Consciousness Studies* 3, 20 (1996).
- Bitbol, M. & Petitengin, C. Neurophenomenology and the Micro-phenomenological Interview. *The Blackwell Companion to Consciousness* 726–739 Preprint at <https://doi.org/doi:10.1002/9781119132363.ch51> (2017).
- Allen, C. The relationship between the temporal structure of magnetoencephalography recorded brain activity and capacity to form discrete auditory representations. *European Journal of Neuroscience* 0, (2018).
- Allen, C. *et al.* Causal manipulation of feed-forward and recurrent processing differentially affects measures of consciousness. *Neurosci. Conscious.* 2020, niaa015 (2020).