

## **Offre de stage de Master / Master Internship offer**

Date of the offer: June2024

### **Tuteur du stage et Laboratoire d'accueil / Internship supervisor and Host laboratory:**

Laboratoire / Lab : Lyon Neuroscience Research Centre (PsyR2)

Duration: 2-6 months

Encadrant du stage / Supervisor for the internship: Jacqueline Scholl, CRCN Inserm, jacqueline.scholl@inserm.fr

Adresse du stage / Address of the internship: CRNL (CH Le Vinatier, 95 Bd Pinel, 69500 Bron)

Site internet de l'équipe / Team Website : <https://sites.google.com/view/jacqueline-scholl/home> and <https://www.psy2team.com>

Langues parlées dans l'équipe / Languages spoken in the lab: English and French

### **Project descriptions**

#### **Project 2: Computational models of attributional styles**

Background:

In recent years, psychology and neuroscience have benefitted greatly from the introduction of computational models of behaviour that capture latent variables driving choices, such as risk aversion or learning rate. Here we will focus on a particular aspect of cognition: how do we correctly attribute outcomes to multiple possible causes? This is a common problem in real life – imagine a student receiving a bad grade, is it due to them not studying hard enough, or was maybe the test unfair? Previously, we (Scholl et al., 2014+2015) have found that people misattribute outcomes to unrelated causes when learning about abstract stimuli. In the real-life example, this would mean possible misattributing a good grade to a 'lucky charm'. However, it is unclear whether these misattributions also happen when people learn about themselves, e.g. how good they are at a task (like 'angry birds') and whether these attributions are affected by moment-to-moment differences in moods states or mood traits (e.g. individual differences in sad/low mood). Previous psychology research using questionnaires has suggested that indeed there are individual differences in 'attributional styles' and that these are important predictors for success in daily life (Mezulis et al. 2004). Here, we will go beyond questionnaires devising computerized tasks that can measure these attributional tendencies with mathematical models, building on our recent work (Spiering et al., in prep). In the context of decision making, emotions are often considered as either irrelevant or even inducing biases. While we need to understand such biases, emotions can also be adaptive and even rational. From this perspective, they can be seen as global cognitive states that ready an organism for situation-appropriate behaviours given human's limited cognitive resources (Kolling & Scholl 2024).

This project:

The student will refine an experimental paradigm to measure credit assignment to self or external factors, based on pilot data (n=50) already obtained. For this, the student will develop computational models (reinforcement learning models) capturing behavior and the role of momentary emotions. Then, the student will acquire a large sample (n=300) online, analyzing whether/how individual differences (questionnaires of psychological traits) affect attributions. This proposal is well suited for a student with either a computational background or prior experience with coding and a strong interest in learning computational modelling of behaviour.

References:

Kolling N, Scholl J (2024) On the role of behavioural modes during temporally extended decision making and their neural substrates. *Current Opinion in Behavioral Sciences* 58: 101404 doi: 10.1016/j.cobeha.2024.101404

Mezulis AH, Abramson LY, Hyde JS, Hankin BL. Is There a Universal Positivity Bias in Attributions? A Meta-Analytic Review of Individual, Developmental, and Cultural Differences in the Self-Serving Attributional Bias. *Psychol Bull.* 2004;130: 711–747. doi:10.1037/0033-2909.130.5.711

Spiering L, O'Reilly JX, Wittmann MK, Kolling N, Rushworth MFS\*, Scholl J\* (in preparation) The neural mechanisms of credit assignment to self and other.

Scholl J\*, Kolling N\*, Nelissen N, Wittmann MK, Harmer CJ, Rushworth MFS (2015) The good, the bad, and the irrelevant: Neural mechanisms of learning real and hypothetical rewards and effort. *Journal of Neuroscience* 35(32): 11233-11251; doi: 10.1523/JNEUROSCI.0396-15.2015

Scholl J, Günthner, Kolling N, Favaron E, Rushworth MFS, Harmer CJ, Reinecke A (2014) A role beyond learning for NMDA receptors in reward-based decision-making – a pharmacological study using d-cycloserine. *Neuropsychopharmacology* doi: 10.1038/npp.2014.144