

the model are robust (i.e., do not need adjustment) to both input levels and variations in noise, allowing for near-optimal integration with fixed circuit properties. The success of this simple model motivated the development of extensions in the form of linear and circular bump attractors. Using similar updating principles, these networks represent and update beliefs about the position and speed of a moving object by integrating intermittent spatiotemporal cues. Together, these results provide a plausible neural substrate for performing complex probabilistic inferences about the dynamic states of objects and events in the environment.

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## **Poster**

### **427. Decision Making II**

**Location:** SDCC Halls B-H

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**Title:** Transfer of confidence in a novel observational learning task

**Authors:** \*T. LARSEN<sup>1</sup>, D. PISCHEDDA<sup>1</sup>, G. CORICELLI<sup>1,2</sup>  
<sup>1</sup>CIMeC, Univ. of Trento, Trento, Italy; <sup>2</sup>USC, Los Angeles, CA

**Abstract:** Methods for measuring the confidence with which people make decisions, have traditionally relied on post-decision self-reports. We wanted to: 1) develop a new experimental paradigm that aims at measuring the confidence in a decision without participants having to explicitly rate their confidence, 2) characterize their decision using fMRI, and 3) show transfer of confidence through observation using the said paradigm.

In our experiment, the participants have to move a cursor around a circle to catch particles moving from the centre to the edge of the circle. The direction of the particles is block-wise determined by a mean and its standard deviation from that mean. The participants can change the size of the cursor, and the amount of points rewarded for each catch is inversely proportional to the size of the cursor.

The paradigm was tested in several deceit-free behavioural psychophysics experiments and analysed using computational modelling.

To test that the task actually measures confidence, we added a condition in which blocks of trials were followed by a confidence rating scale. The model estimated trial-by-trial particle variance correlated strongly with the normalized ratings given by the participants. Similarly, the computational modelling found each participant's trial-by-trial estimation of the particle variance to be correlated with the width of the cursor on the given trial.

fMRI results show strong correlations between expected decision making and learning areas

adding validity to the task.

Finally, to investigate if it is possible to transfer confidence between participants, we ran an experiment where participants could observe the cursor width chosen by previous participants. Results show that participants that observed a player with higher base confidence chose a significantly smaller catcher than the group observing a player with lower base confidence, an effect that persisted after the other player's choices were no longer displayed.

In conclusion, we have developed a novel task that allows for measuring choice confidence implicitly, and used this task to show that participants adapt an observed level of confidence to their own choices, a level that persists even after observations are no longer available.

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## **Poster**

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**Title:** Ramping risk-taking: Progressing value function increases gambling in humans

**Authors:** \***G. J. PAGNIER**, A. WESTBROOK<sup>1,2,3</sup>, M. J. FRANK<sup>3</sup>

<sup>1</sup>Donders Inst. for Brain, Cognition and Behaviour, Radboud Univ., Nijmegen, Netherlands;

<sup>2</sup>Dept. of Psychiatry, Radboud Univ. Med. Ctr., Nijmegen, Netherlands; <sup>3</sup>Cognitive, Linguistics, & Psychological Sci. Dept., Brown Univ., Providence, RI

**Abstract:** Anticipating a reward is critical for guiding behavior. Recent work has hypothesized that mesolimbic dopamine (DA) levels, distinct from phasic DA reward prediction errors, encode this anticipation by signaling the value of work (Hamid et al., 2016). In an instrumental task, rats exhibit a gradual ramping up of extracellular mesolimbic DA tone in proportion to the distance to, and magnitude, of the reward. But while previous accounts suggest that such DA ramps only invigorate responding, our theoretical models of striatal DA (Collins & Frank, 2014) suggest that higher endogenous DA levels would also bias decisions toward options that have higher perceived reward even if they also have higher cost. Here, we test the prediction that humans are more likely to gamble for a potential, larger reward at the expense of losing a certain reward, the closer they are to receiving that certain reward (i.e., as the value function ramps). We developed a novel gambling task in which participants were promised a certain amount of money at the end of a fixed interval on every trial, with progress indicated by a continuous progress bar. As the progress bar was filling up, participants were sometimes presented with the choice to either stay