

# Ready, set, explore! Event-related potentials reveal the time-course of exploratory decisions

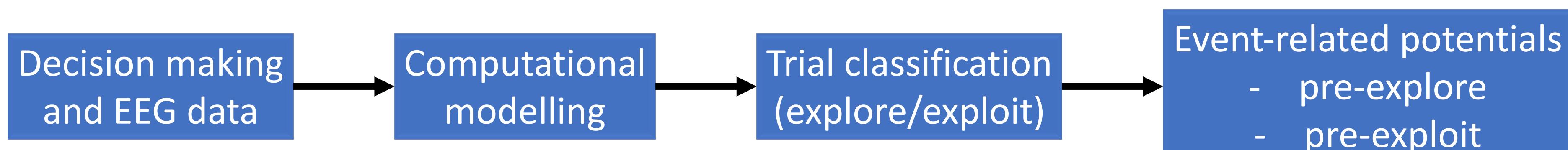
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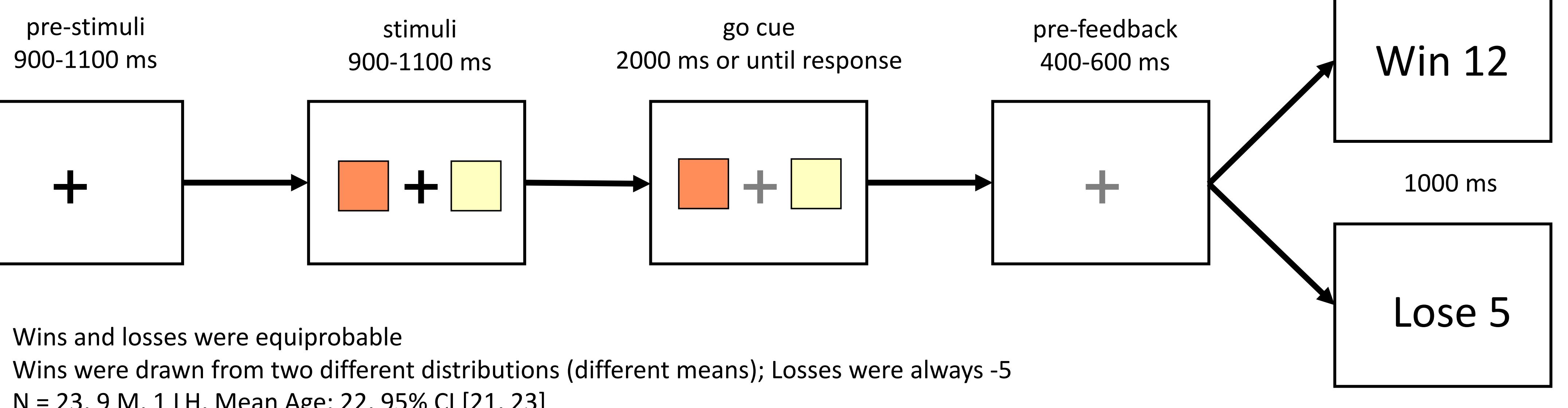
## INTRODUCTION

When do we *exploit* previous learning, and when do we *explore*?  
Which neural systems are involved?

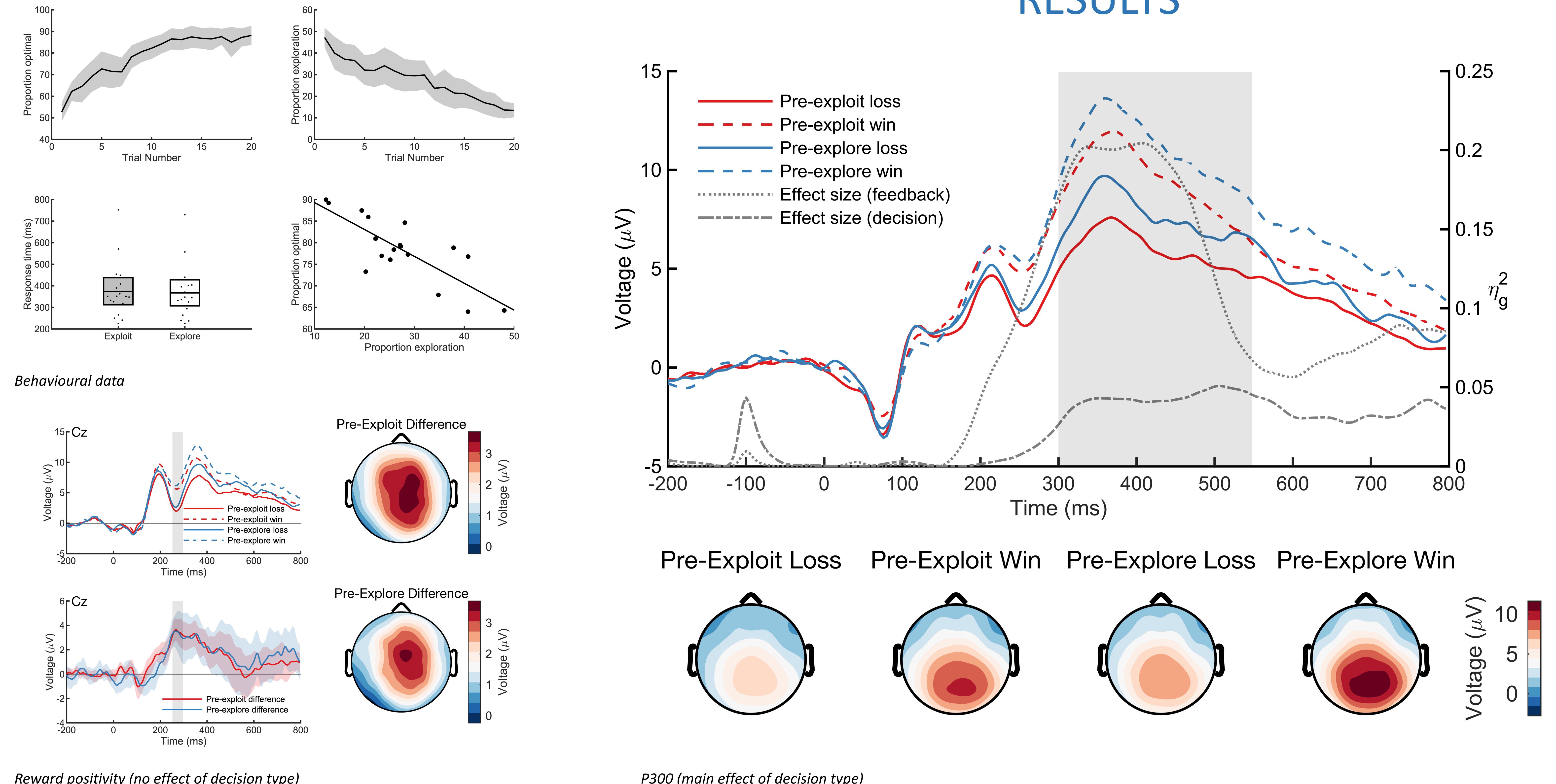
Neurotransmitter	Source	Target	Event-Related Potential	Function
Dopamine	Basal Ganglia	ACC	reward positivity <sup>1</sup>	reinforcement learning <sup>1</sup>
Norepinephrine	Locus Coeruleus	Various	P300 <sup>2</sup> , N200 <sup>3</sup>	neural interrupt <sup>4</sup> , response conflict <sup>5</sup>



## METHODS



## RESULTS



## Conclusions

- Phasic activity of the LC-NE system, as indexed by a feedback-locked P300, plays a critical role in triggering a switch from exploitative to explorative decision making
- Phasic midbrain dopamine does not appear to play this same role
- The period just prior to a decision to explore involves response conflict

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