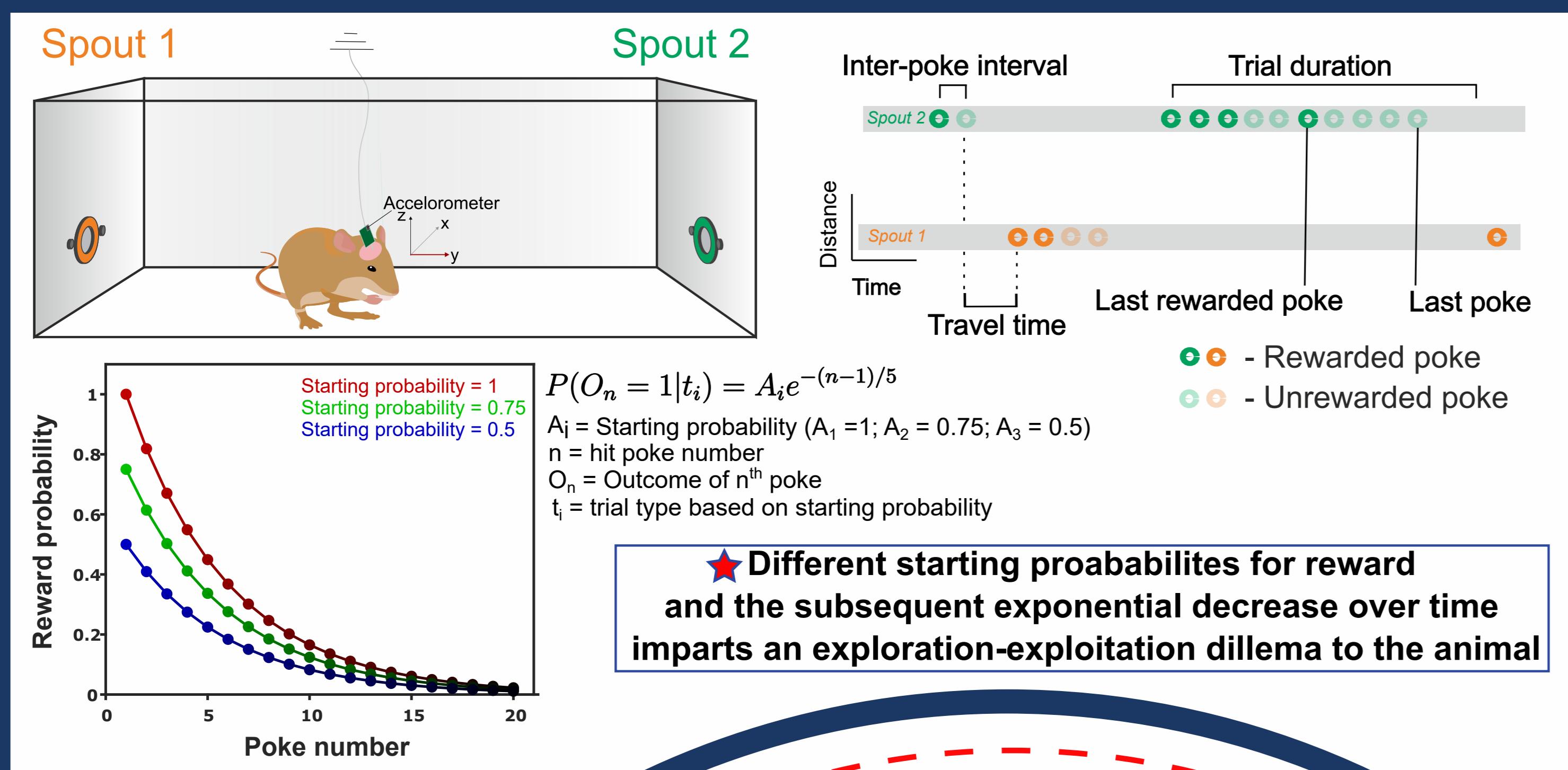


Unraveling the Neural Mechanisms of Decision-Making in Uncertain Environments: Insights from a Probabilistic Foraging Task in Mongolian Gerbils

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The situation - probabilistic foraging task

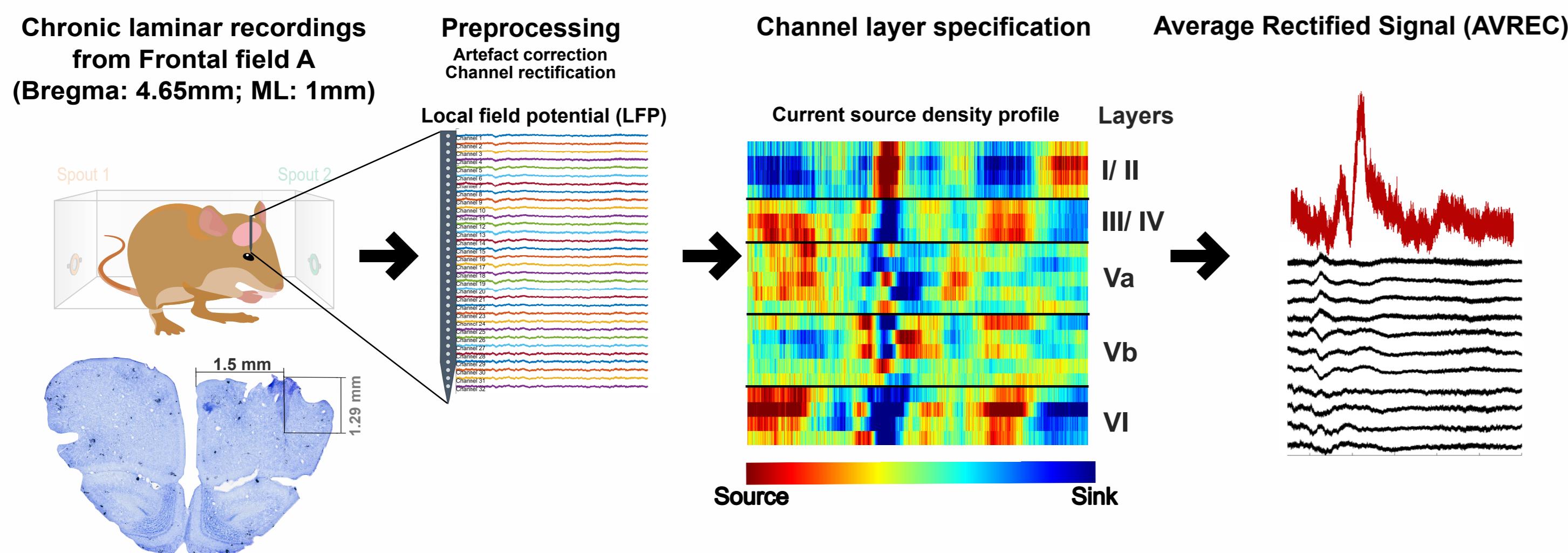


Should I stay or shift?

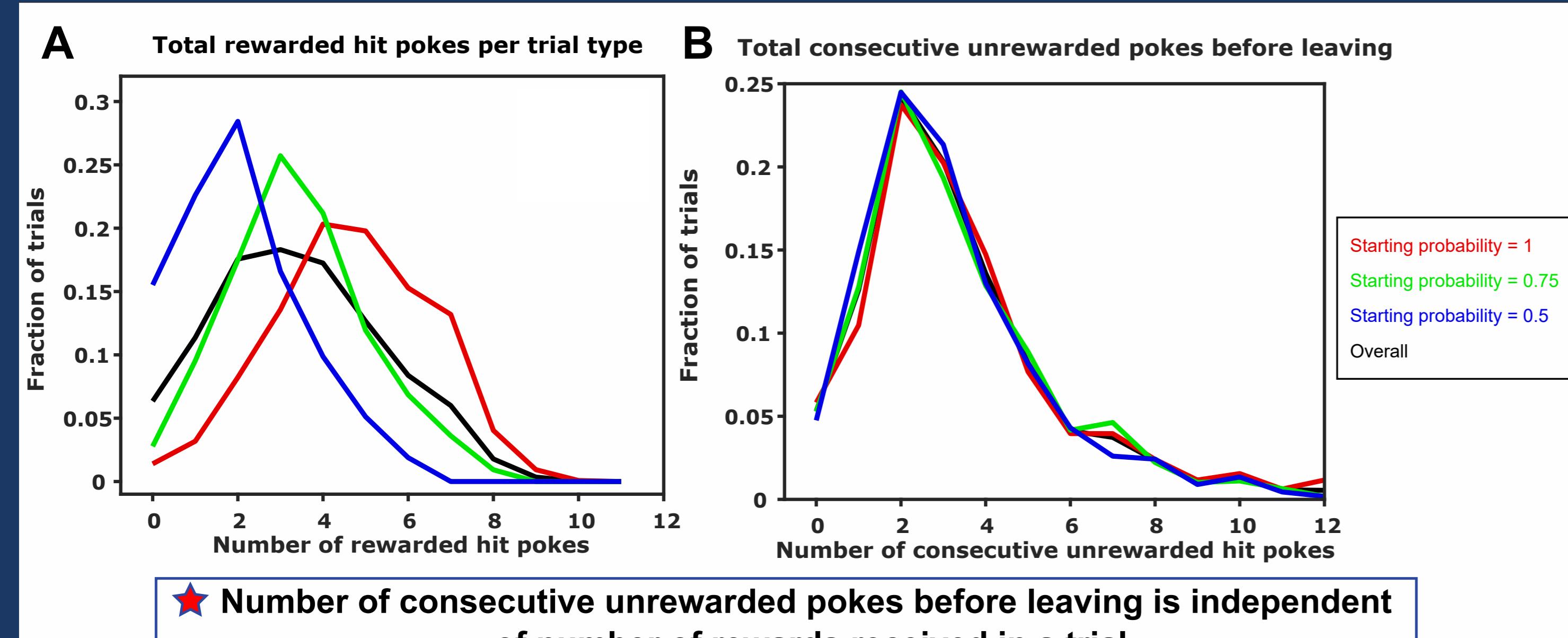
Exploitation Exploration

Frontal cortex orchestrates the adaptive decision making

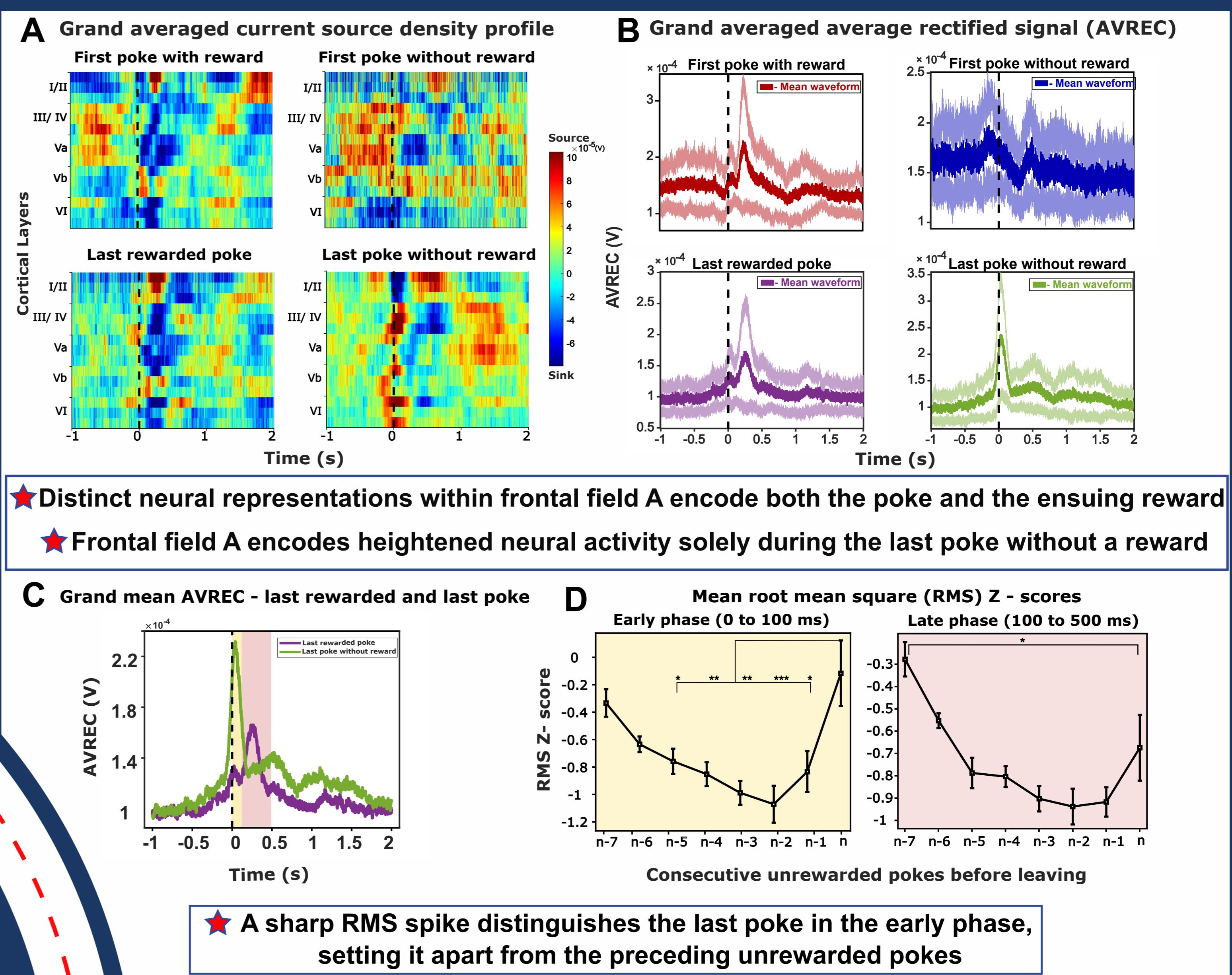
How did we study this?



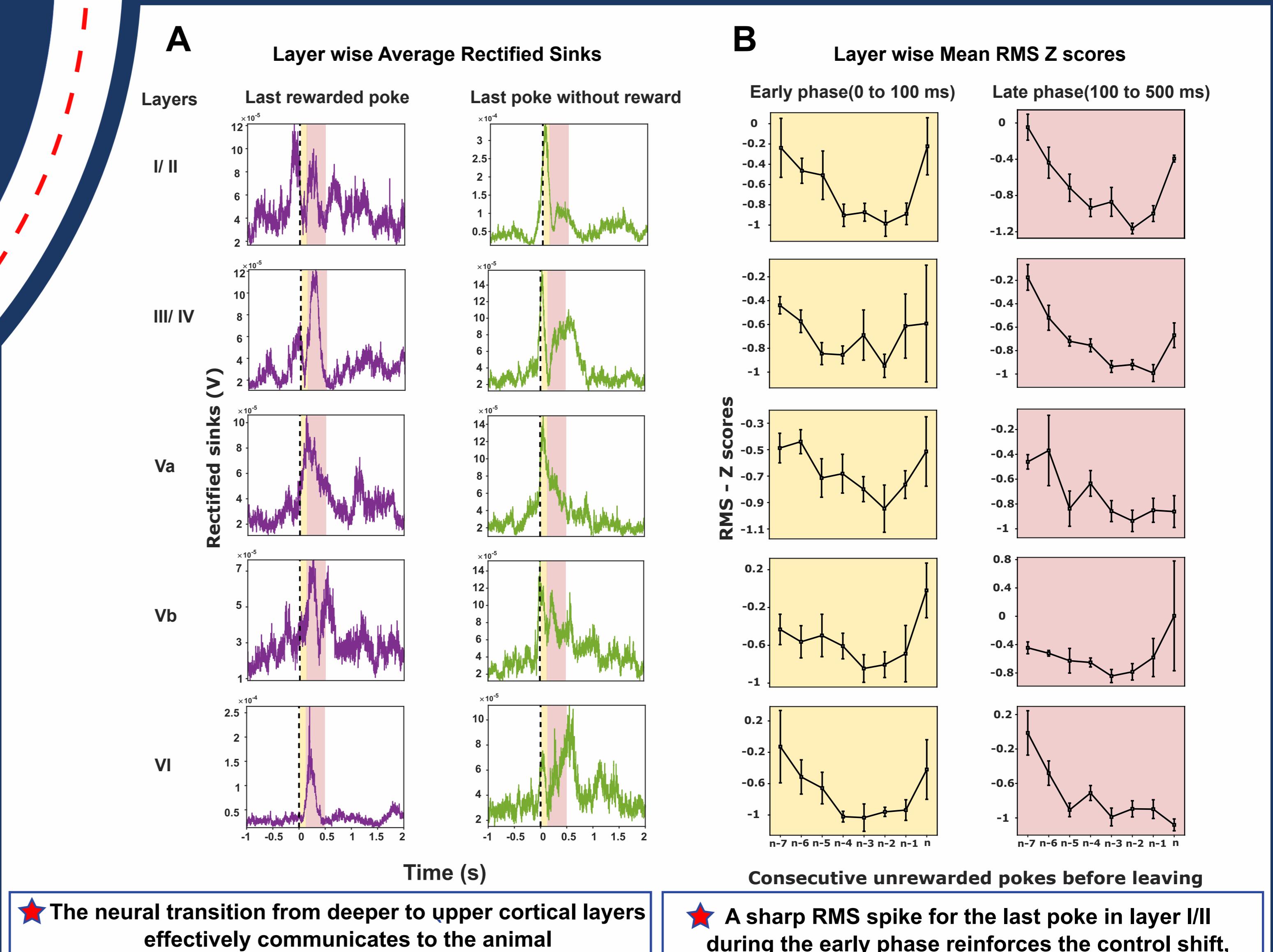
Animals make inference based decisions



What makes the last poke the last one?



Frontal layer dynamics during decision making



Concluding insights & next steps

Conclusion

◆ The transition of control from deeper to upper layers, complemented by the heightened activation of layer I/II during the finalpoke empowers the animal to shift from **exploitation to exploration** during uncertain environments, thereby, orchestrating adaptive decision making.

Steps ahead

- ◆ **GLM(M) Model Validation:** Validate Generalized Linear Models (GLM(M)) to assess the accuracy of overall cortical and layerwise RMS z-scores as pivotal decision features predicting the animal's shift from current spout.
- ◆ **Reinforcement Learning Modelling:** Develop a reinforcement learning model to replicate the animal's inference-bound decision-making behavior, providing insights into the neural circuitry's role in adaptive choices.

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