



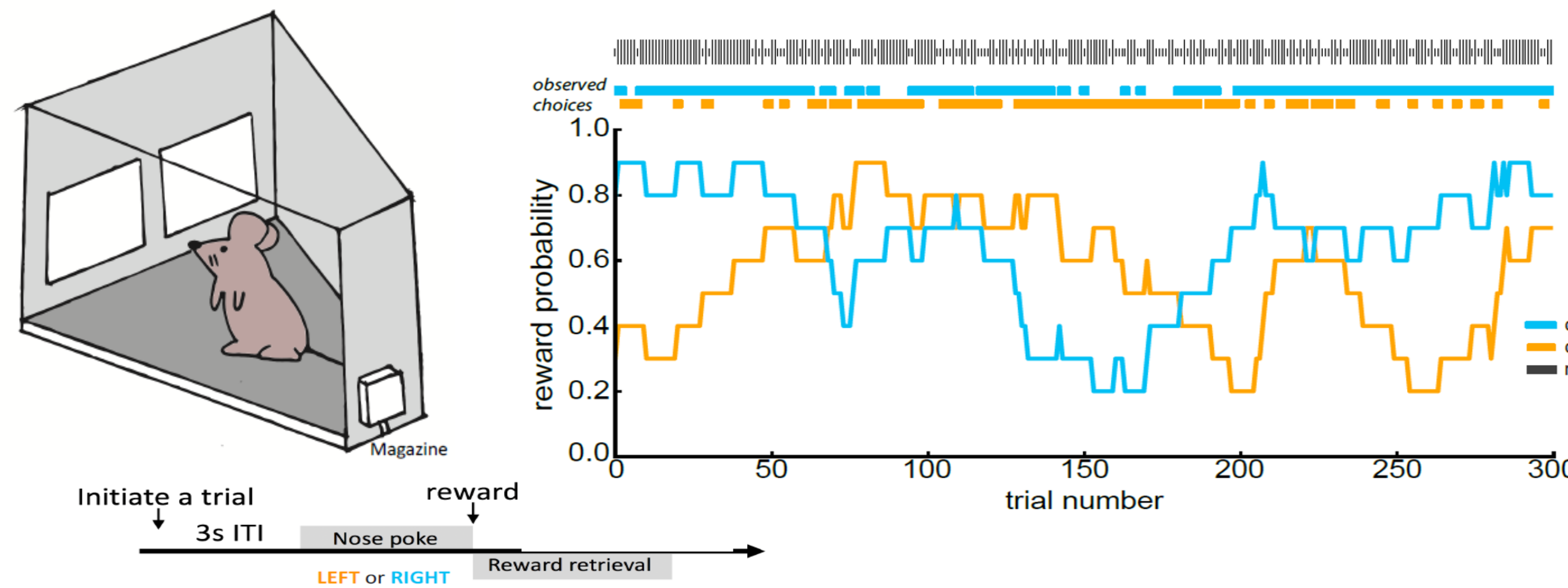
Stress Influences on the Explore-Exploit Tradeoff in Reward-Guided Decision Making

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Stress and Reward-Guided Decision Making

- In uncertain environments, we must decide between exploring new information and exploiting existing knowledge.
- Stress causes a widespread refocusing of cognitive resources, and alters catecholamine function, including dopamine, to affect reward valuation.
- Other types of stressors such as restraint stress have been shown to improve reversal learning (Thai, Zhang & Howland, 2013; Bryce & Howland, 2015).



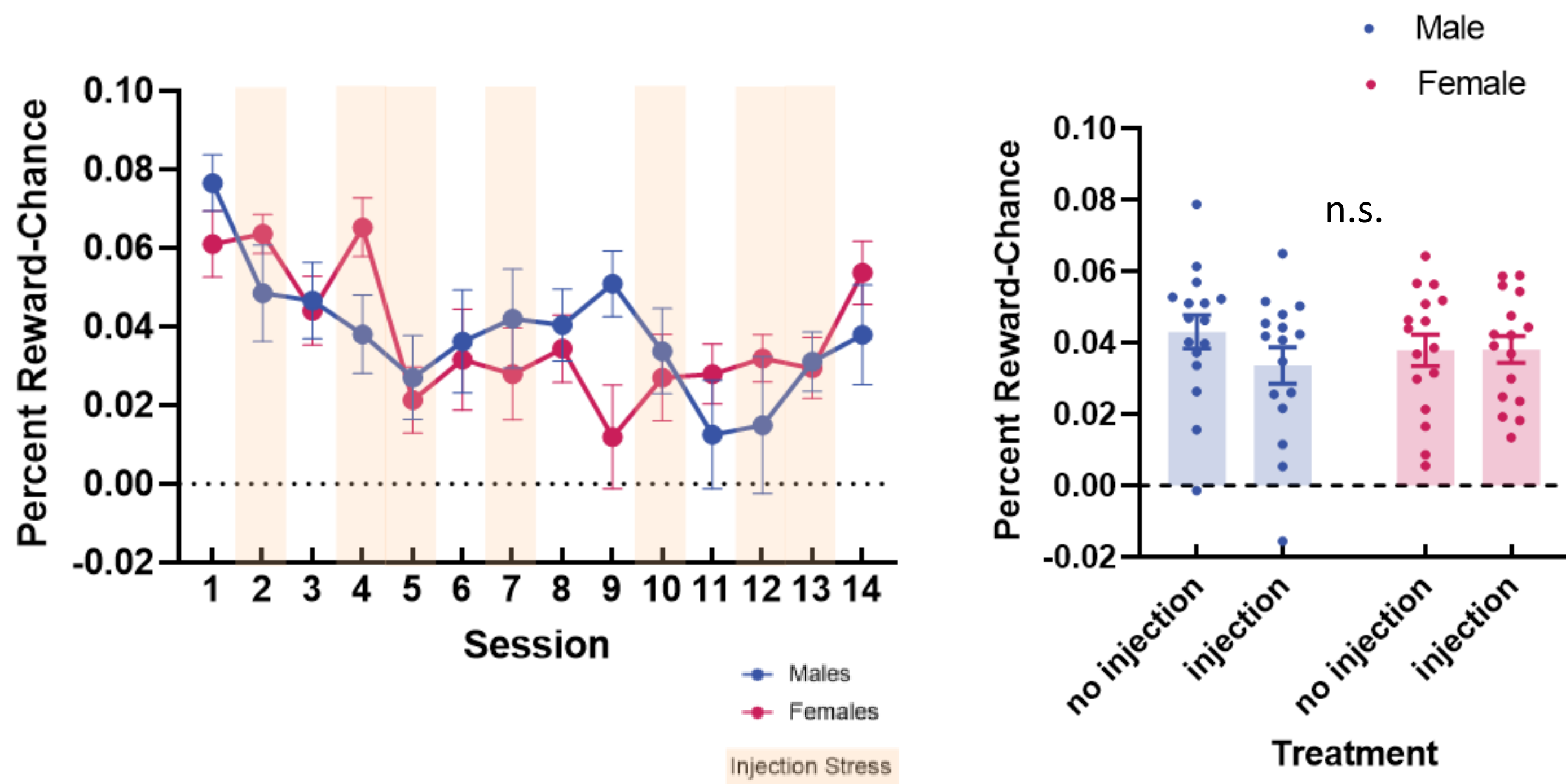
Restless Two-arm Bandit Task

- Reward probability of each choice changes independently and randomly across trials.
- Task design encourages exploration and exploitation.

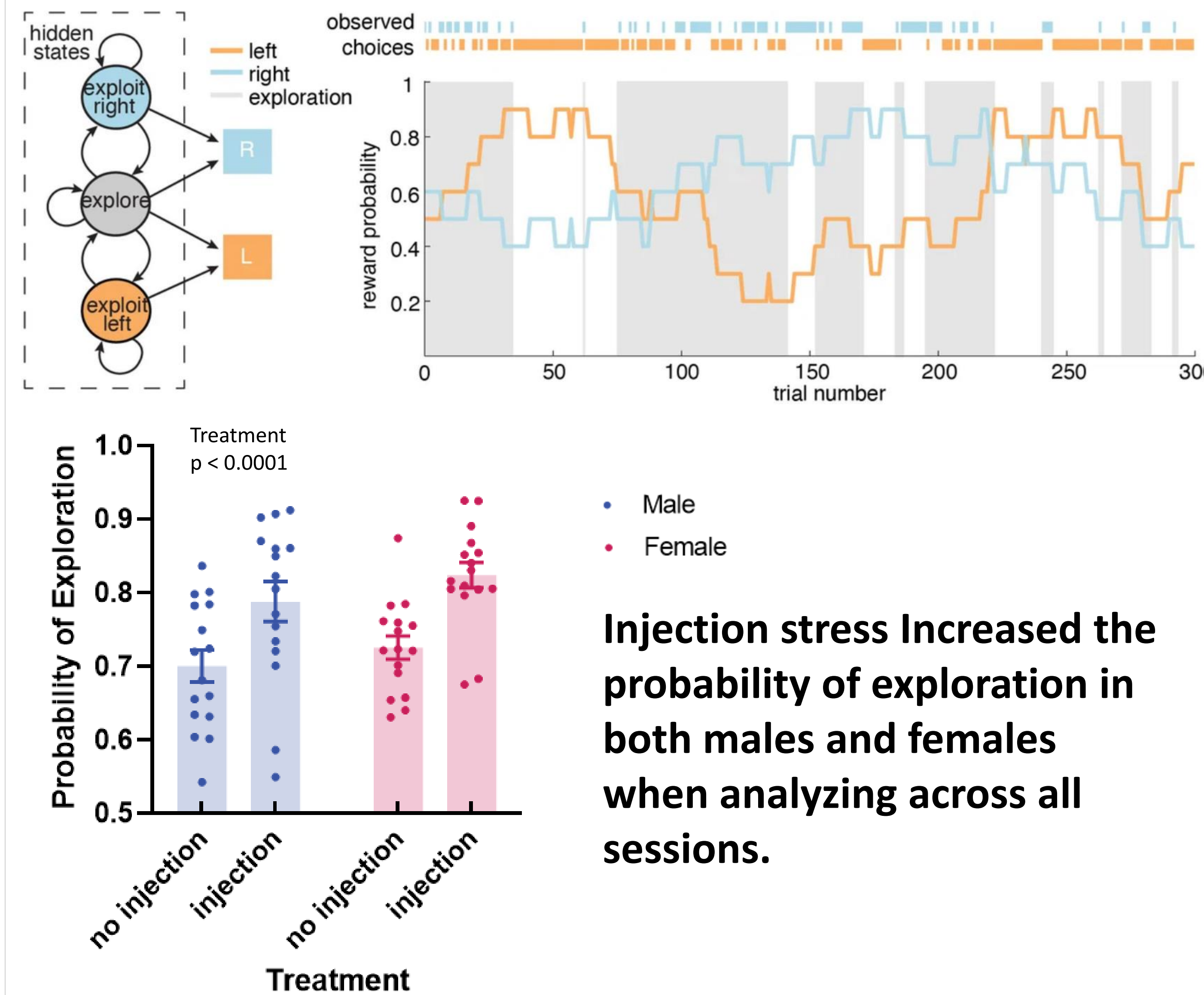


Stress did not Significantly Impact Correct Performance

- The session graph illustrates possible habituation within the last 5 days.



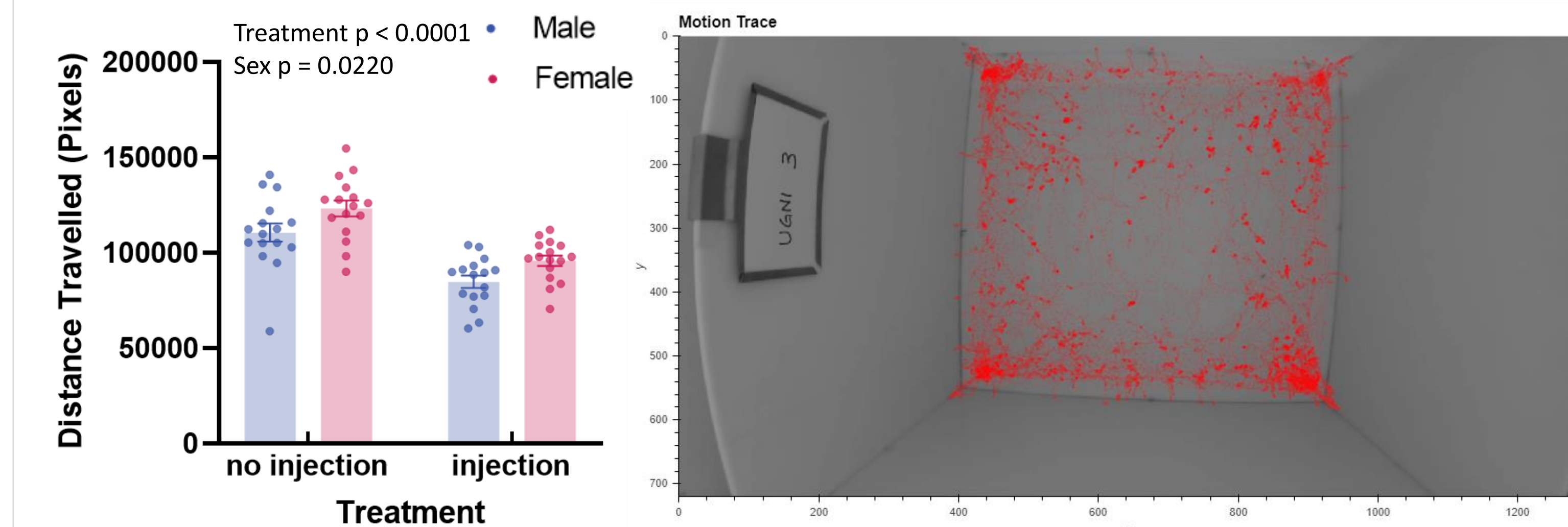
Injection Stress Increased Probability of Exploration During Decision Making



Injection stress increased the probability of exploration in both males and females when analyzing across all sessions.

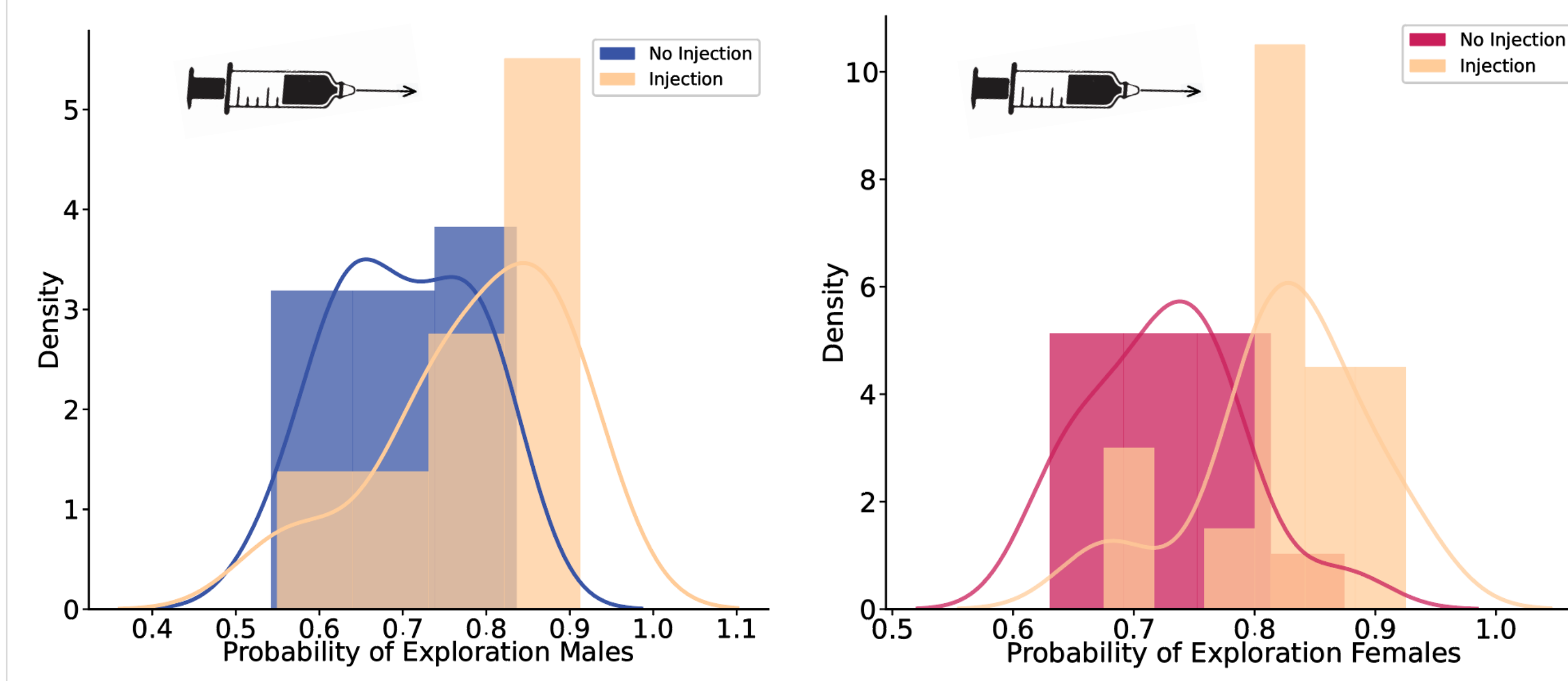
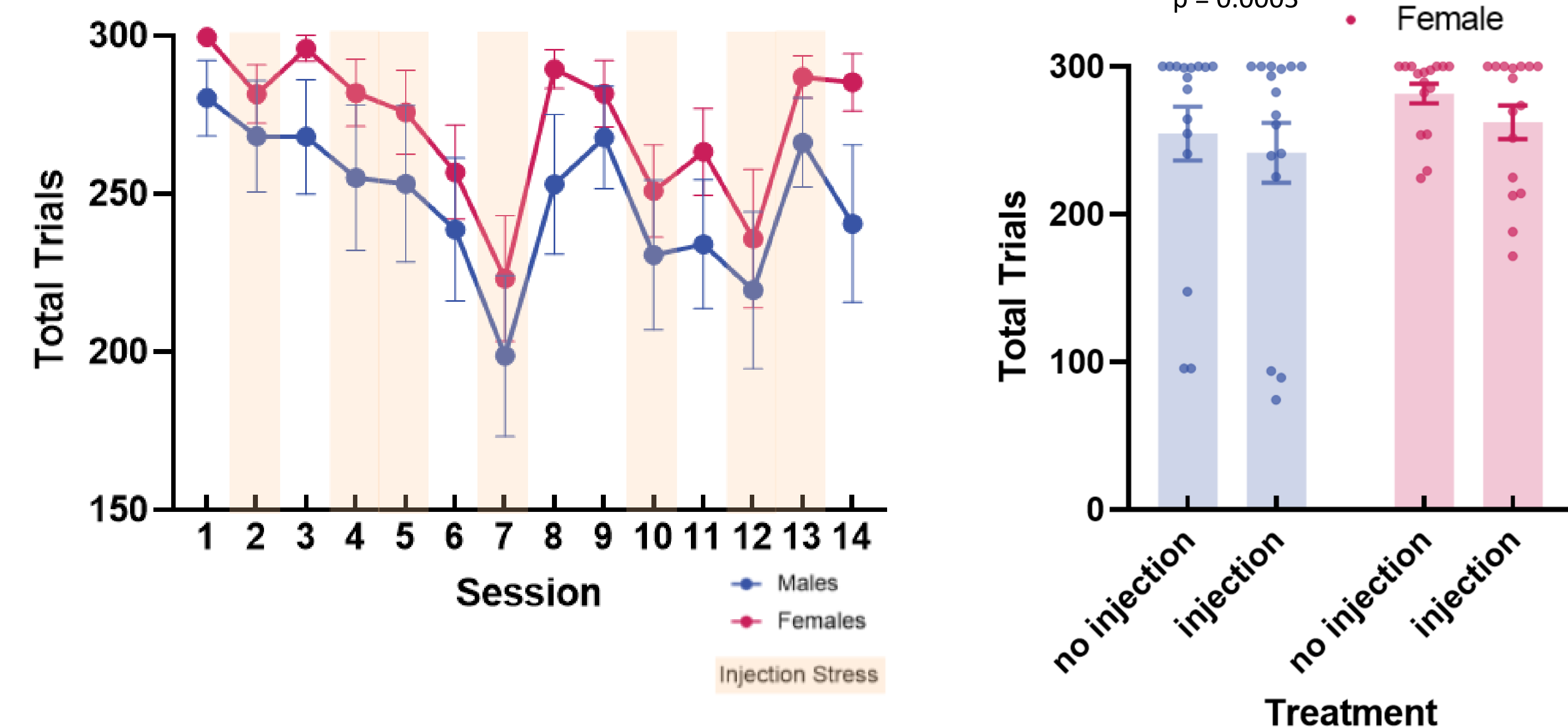
Injection Stress Significantly Impacts locomotor Behavior in Male and Female Mice

- Locomotor distance was measured in pixels after mice completed a 10-minute locomotor task in an open field arena.



Injection Stress Negatively Impacts the Total Number of Trials Completed

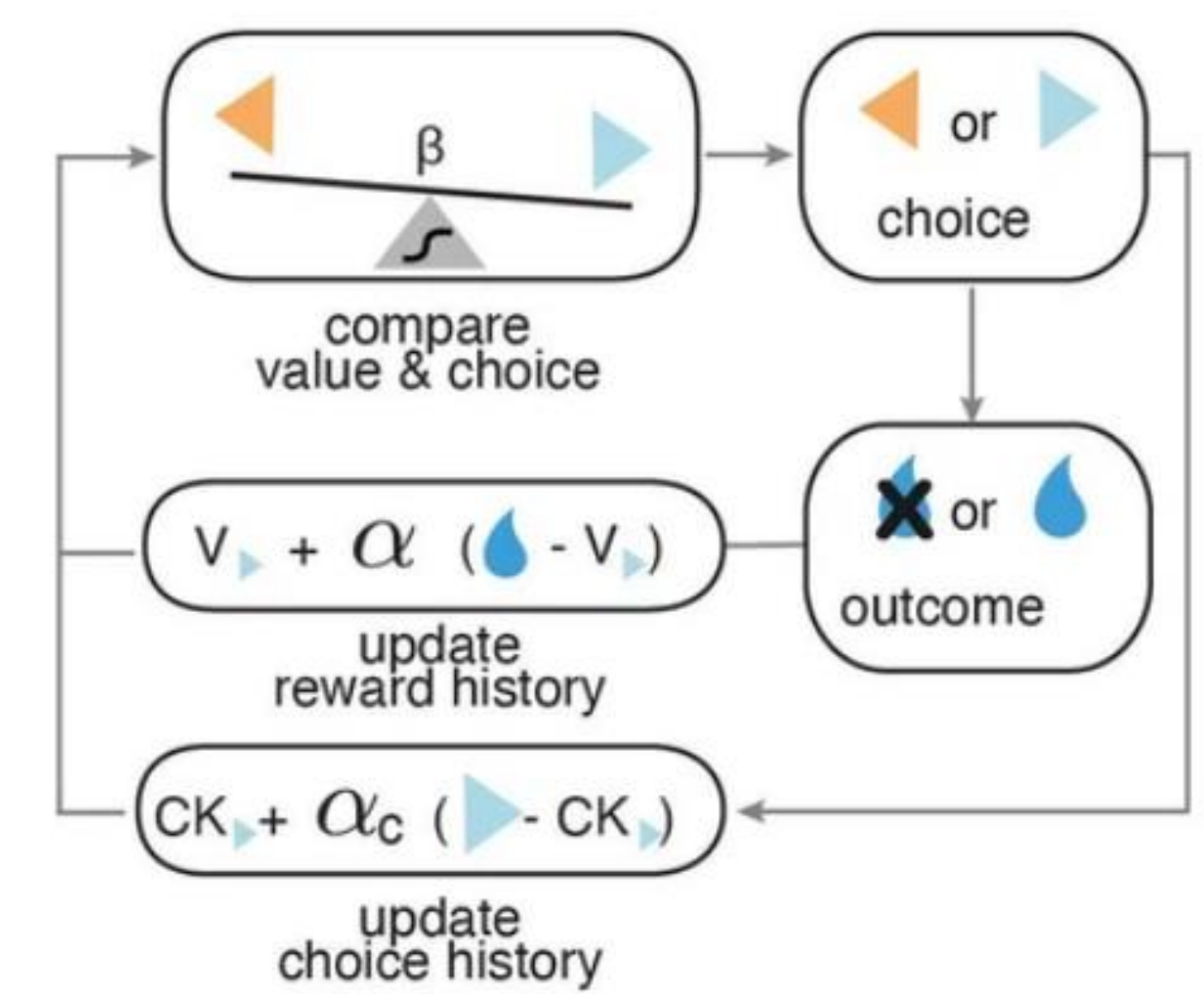
- Injection stress decreased the total number of trials completed out of 300 in both male and female mice.



Future Directions & Summary

Increased Probability of Exploration

- Are mice in the stress condition exploiting less during the bandit task because they are less motivated to work for the higher rewarded choice?
- Future analyses will include reinforcement learning modeling including learning rate and decision noise to characterize animals' choice behavior.



Reduced Distance Traveled

- Stress decreased total distance traveled (pixels) during open field locomotor behavior for both males and females.
- Future direction: Interested in determining if this result is seen in other forms of stress.