

Impacts of Stress During Early Puberty on Tracking Behavior

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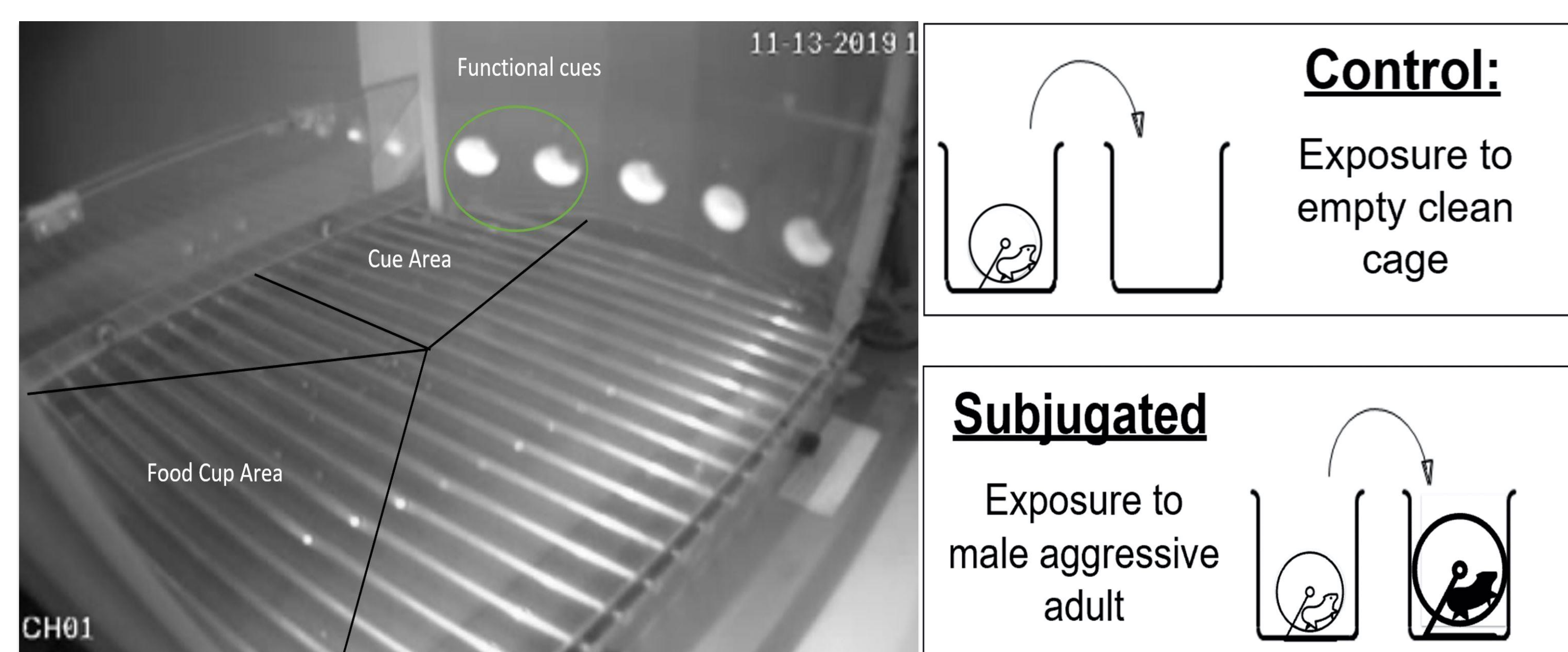
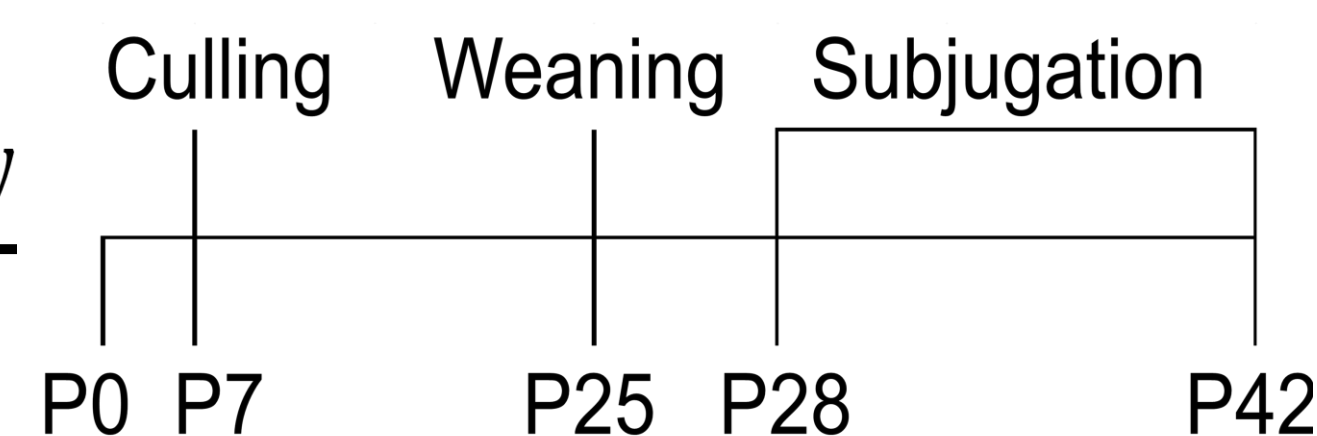
Background

- Sign-tracking (ST) behavior: Incentive salience attributed to a reward associated cue instead of the reward in conditioning.
- Goal-tracking (GT) behavior: Incentive salience attributed to the reward instead of the reward associated cue in conditioning.
- Stress during early puberty has been found to have an impact on the mesolimbic system and impulsivity.
- Tracking behavior has been associated with impulsivity, substance abuse & the dopaminergic mesolimbic system.
- However, the impacts of stress during early puberty on tracking behavior has not been investigated. My study investigated the effects of chronic social stress during early puberty on tracking behavior during adulthood.

Methods and Measures

- Independent variable: Chronic social stress during early puberty.
- Dependent variable: Tracking behavior measured by area orientation and Pavlovian Conditioned Approach Index (PCAI).

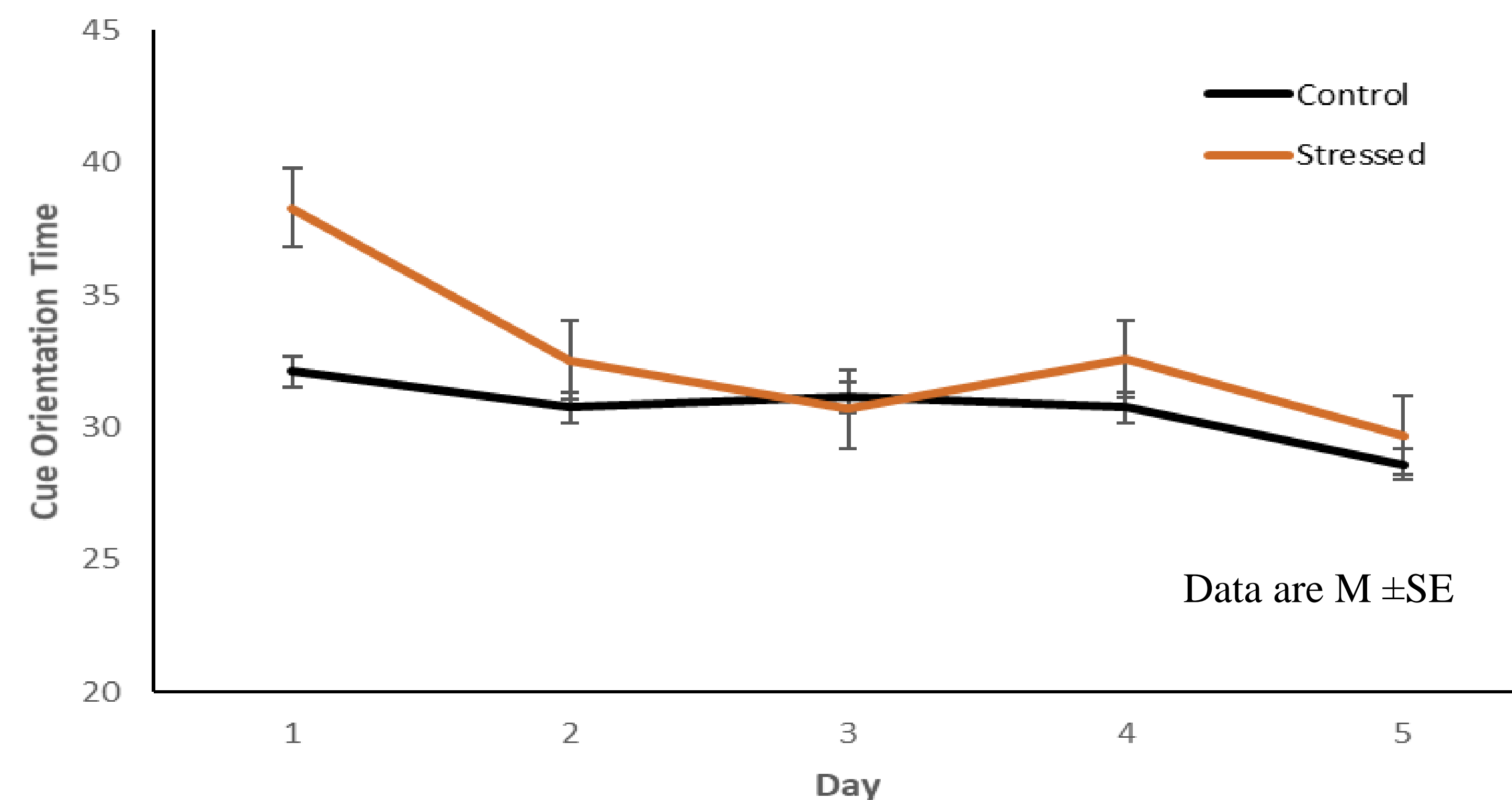
$$PCAI = \frac{\text{Mean Foodcup Latency} - \text{Mean Cue Latency}}{\text{Response Time}}$$



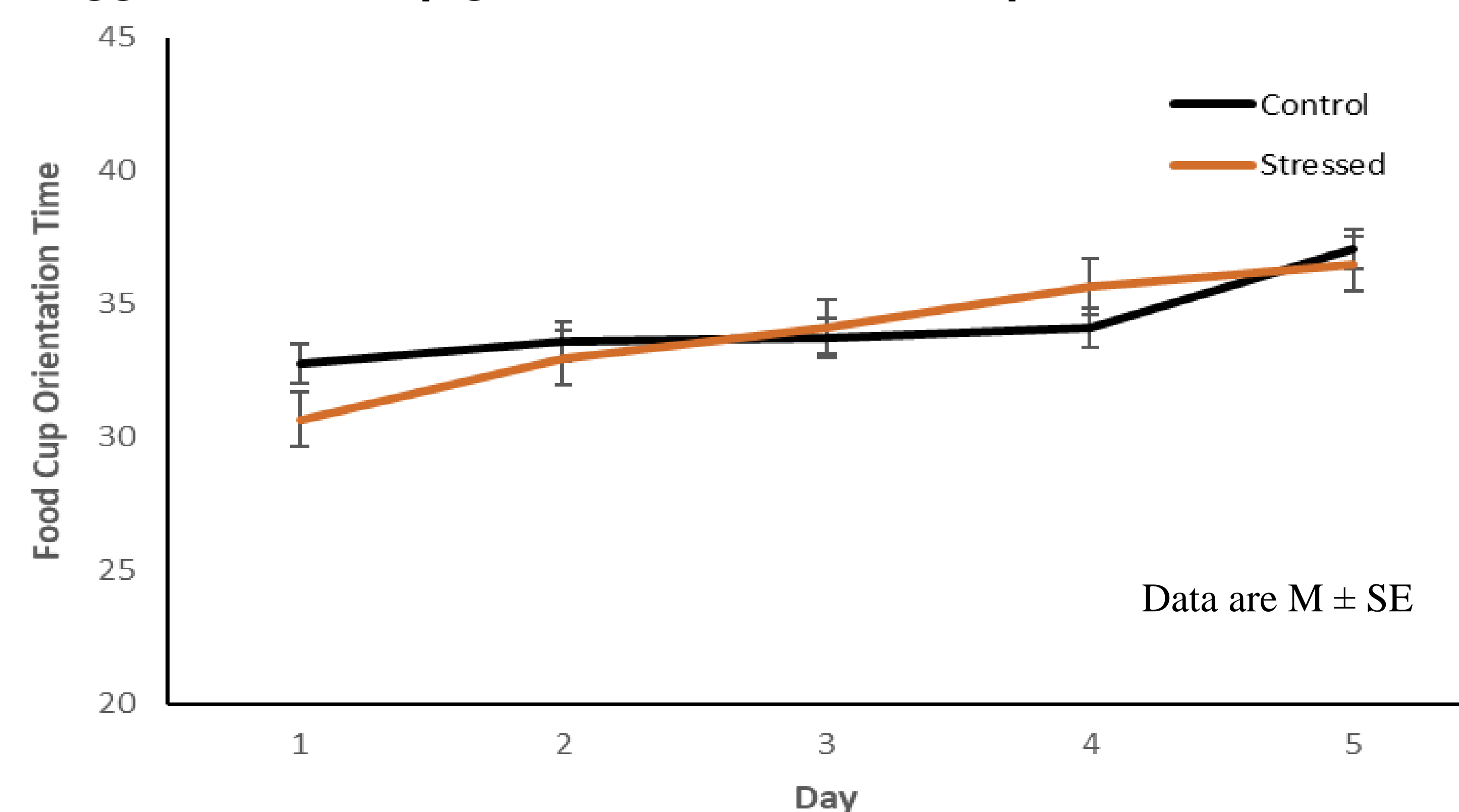
- Cue latency: Time lapse from onset of cues to arrival at cue area.
- Foodcup latency: Time lapse from onset of cues to arrival at foodcup.
- Response time for a hamster averages at 20 seconds.
- Cue orientation: Percentage of time spent around the cue area.
- Foodcup orientation: Percentage of time spent around the foodcup.

Results

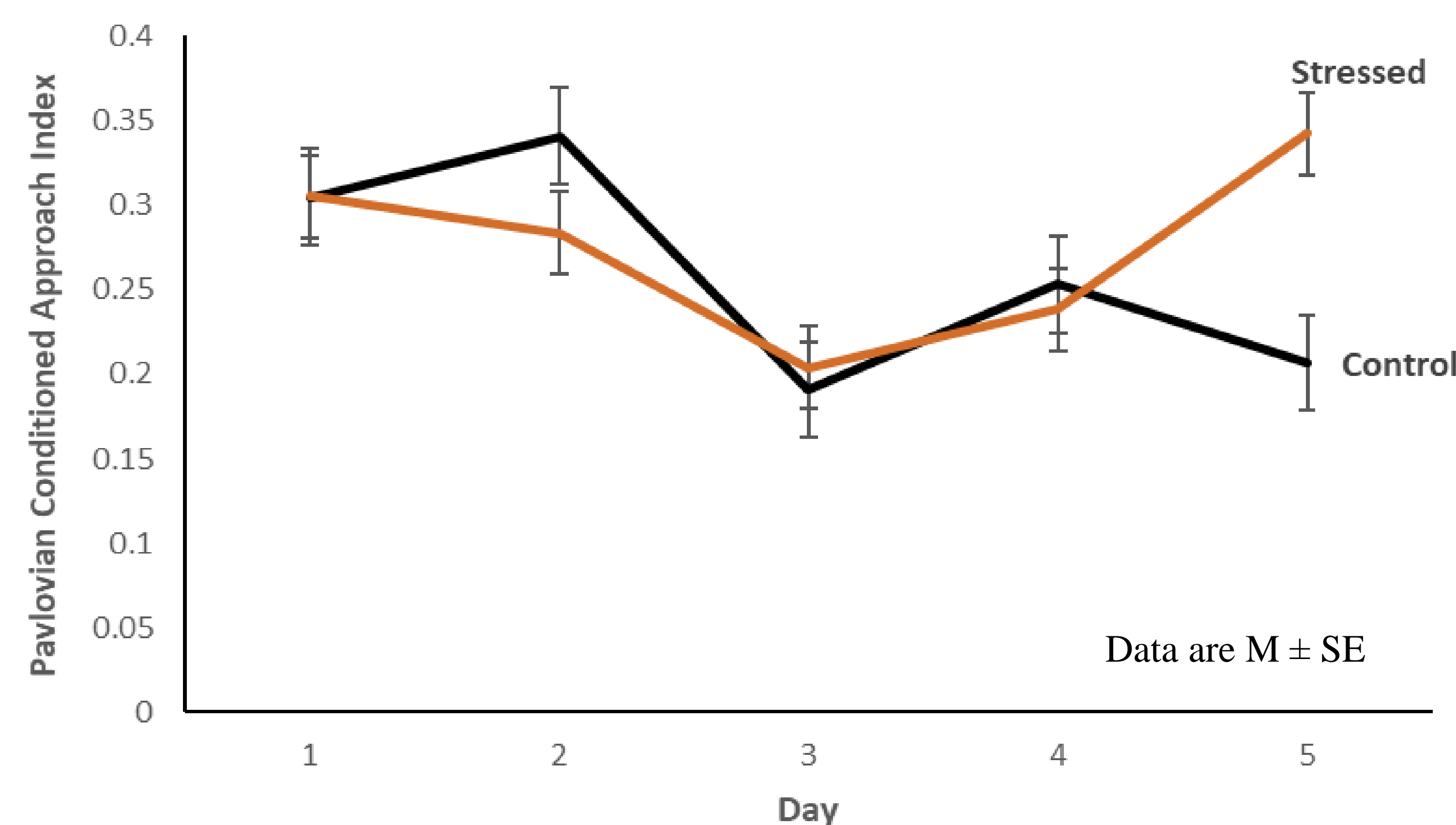
No significant differences in cue orientation between groups suggests that subjugation did not inhibit or promote ST behavior.



No significant differences in food cup orientation between groups suggests that subjugation did not inhibit or promote GT behavior.



No significant differences in PCAI between groups suggests that subjugation did not impact tracking behavior.



Hypotheses

Stress during puberty increases GT behavior in adulthood.

- Increase in foodcup orientation
- Decrease in cue orientation
- Decrease in Pavlovian Conditioned Approach Index (PCAI)

Summary & Conclusions

Linear Multilevel Modeling

- Linear multilevel models were applied to test the effects of stress during puberty on PCAI, cue orientation, and foodcup orientation between groups, overtime, and between groups overtime.
- No differences in PCAI between groups, suggest that stress didn't impact the attribution of incentive salience to the cues or reward.
- No differences in area orientation between groups suggest that stress didn't impact the amount of attention given to a specific area.
 - However, overall foodcup orientation significantly increased overtime, and cue orientation significantly decreased overtime, suggesting that hamsters learned to expect food at the foodcup.

T-tests

- Individual T-tests were used on each day to test for differences between groups on cue orientation, foodcup orientation and PCAI.
- After Bonferroni corrections were applied, no significant differences were found between the control and subjugated group on any day.

Conclusions

The lack of significant findings could mean that the previous model for testing tracking behavior could have been flawed by placing levers as cues right next to the foodcup allowing for mistakes during video analysis to be made.

Acknowledgments & References

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- González-Martínez, L. F., Daigle, J., Lee, S. M., Lee, H. J., & Delville, Y. (2017). Social stress in early puberty has long-term impacts on impulsive action. *Behavioral Neuroscience*