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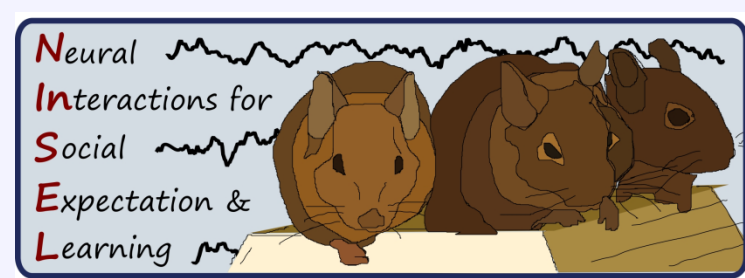
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# Is Play Behavior in Adolescent Rats Regulated at The Levels of Dyads or Individuals?



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## Introduction

- Social motivation may be general (motivated for social contact) or specific (motivated to connect with someone in particular)
- Play behavior is known to increase if rats are socially isolated, but we do not know if this represents *general* or *specific* social motivation.

## Research Question:

Is play behavior in adolescent rats related to interest in specific individuals, or is it an expression of more general motivation to interact?

## Hypothesis:

Rats' motivation to play involves learning about specific individuals, and motivation will therefore increase if two individuals have not seen one-another for an extended period of time.

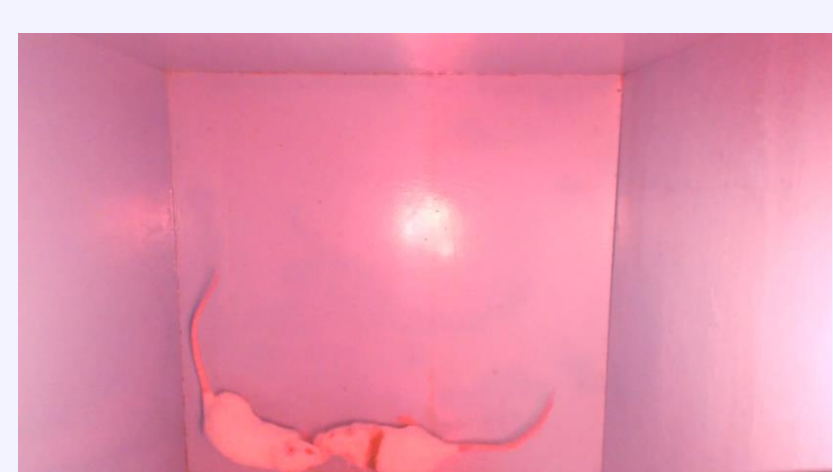
**Prediction:** Both separation and isolation will elicit more interactive behaviors compared with 1-minute control period.

## Methods

- We video recorded physical interactions of rat dyads following different isolation or separation manipulations.
- 8 dyads were recorded during 3 sessions: separation, isolation, and a 1-minute isolation control
- Behaviors were scored using BORIS. This software allows users to mark specific ethogram events, such as sniffing and huddling, during video playback.



Rats not interacting. Rat 1 is painted to distinguish it from Rat 2.



Face to Face interaction.

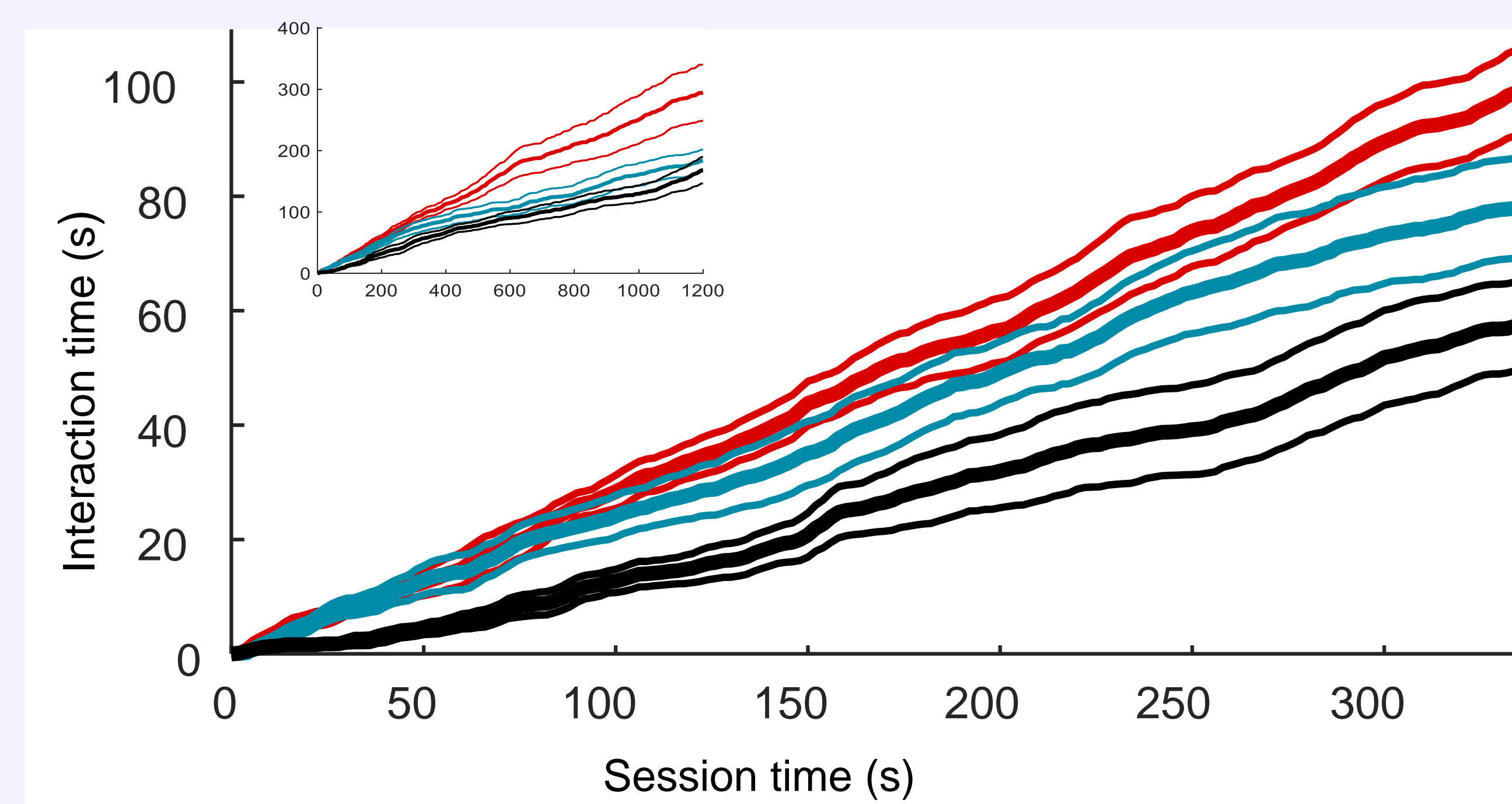
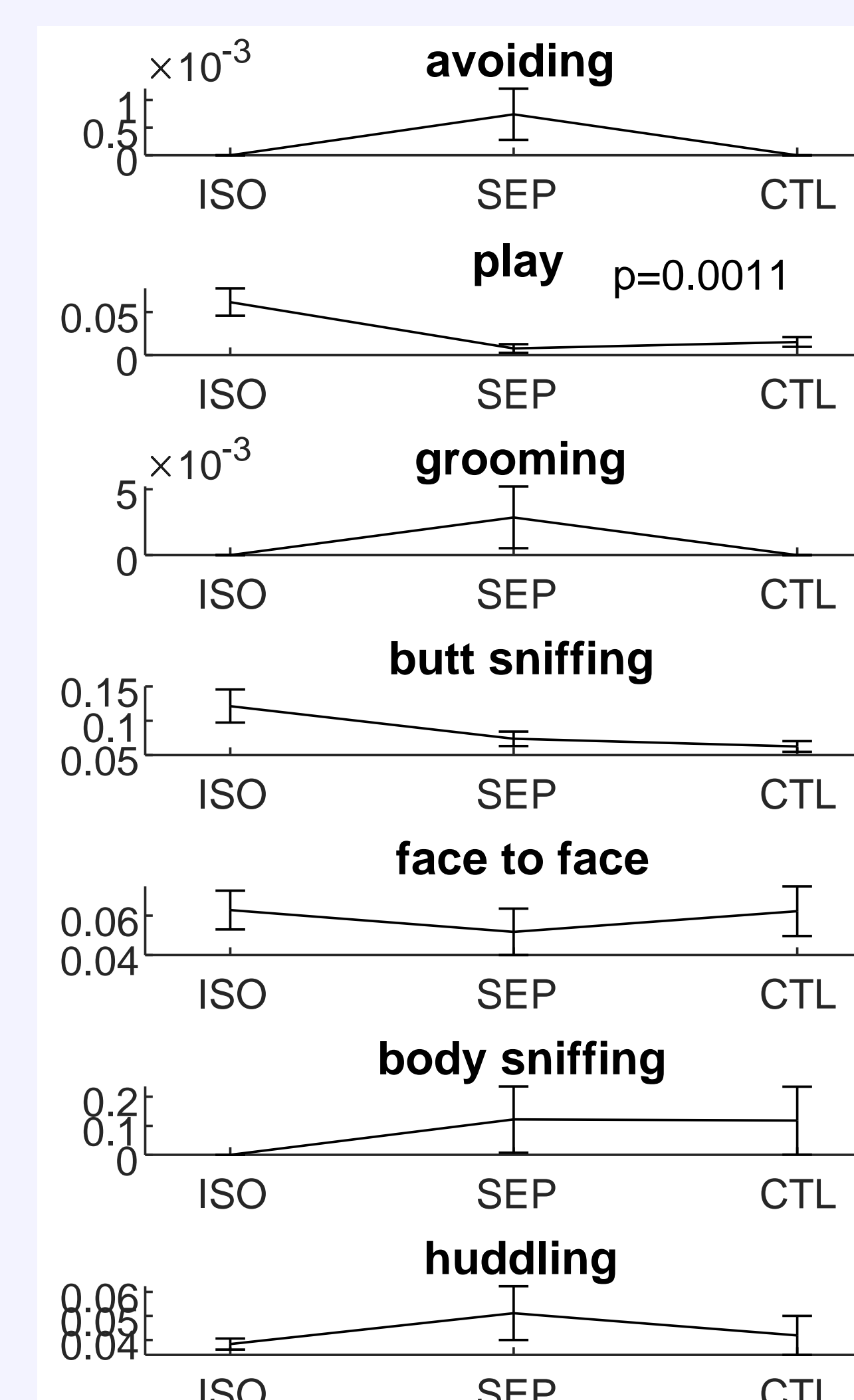
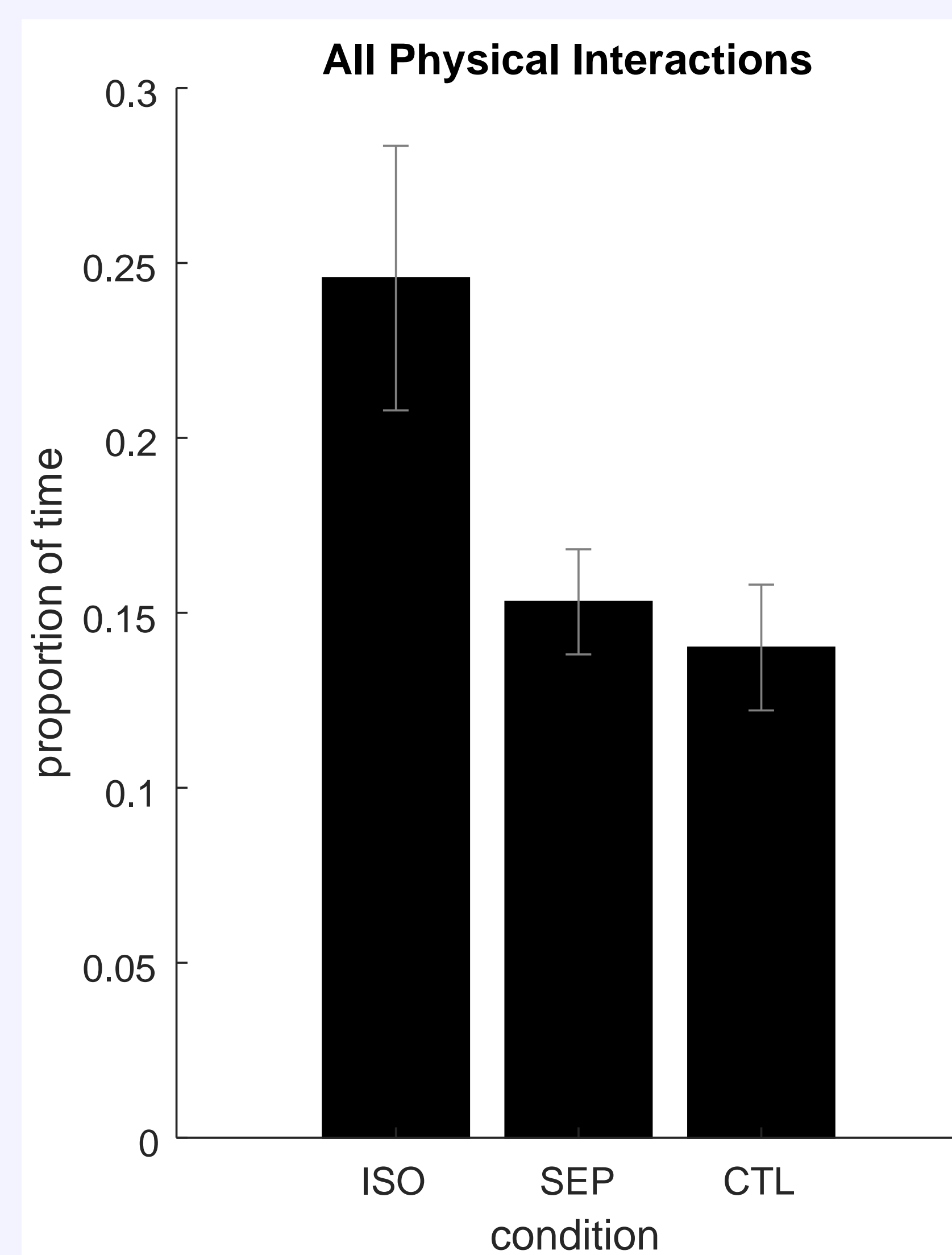


Rear-sniffing interaction.

## Results

Proportion of time interacting was higher in isolation (ISO) compared with separation (SEP) and 1-minute control (CTL) conditions. Error bars are SEMs.

Isolation (ISO), Separation (SEP), and 1-minute control (CTL) conditions relative to different behavior types. The only significant individual behavior is play.



Cumulative time interacting over first 5 minutes, averaged across dyads: Red line is Isolation, Blue line is Separation, Black line is 1-minute control. There are significant differences between separation and 1-minute control, specifically between 25-45 seconds and just before the 5-minute mark (300s). Smaller figure is given for comparison on a full-length time interval relative to the experiments.

**Play behavior increases if individuals are isolated, but not if dyads are separated.**

## Summary and Future direction

- Play behavior increases after isolation but not separation-without-isolation. I.e., If adolescent rats play with their cage mate, they are not also motivated to play more with other individuals who they have not recently encountered.

*These results are inconsistent with our hypothesis and suggest that play behavior may not be driven by a motivation to re-establish relationships.*

This study has significant implications for understanding how different social behaviors are motivated in different species, or between different life stages.