

Individual Variability in Working Memory of Male C57Bl6 Mice in Response to Repeated Variable Social Stress (RVSS)

Introduction

- 322 million suffer from **depression** worldwide (WHO)
 - Many go untreated and undiagnosed
- High unemployment**, and **suicide rates** this can also lead to **substance abuse**
- Past research has shown that **social interactions** prior to a stressful event can help act as a social buffer, thus helping individuals remain resilient to stress (Dawans et al).

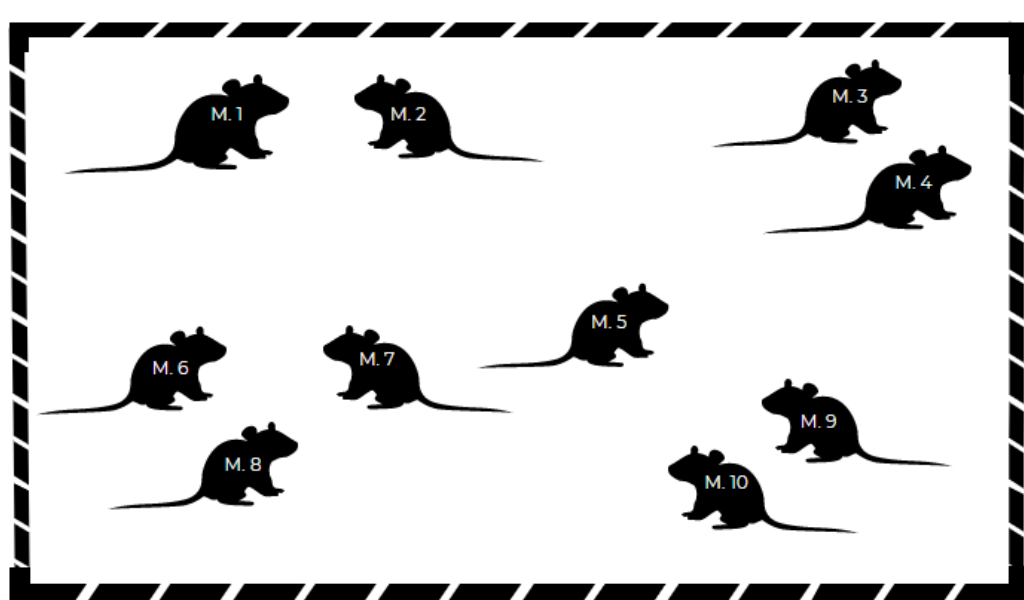
Hypothesis: In males, after RVSS they will follow the tend and befriend theory, similarly to females.

Methodology

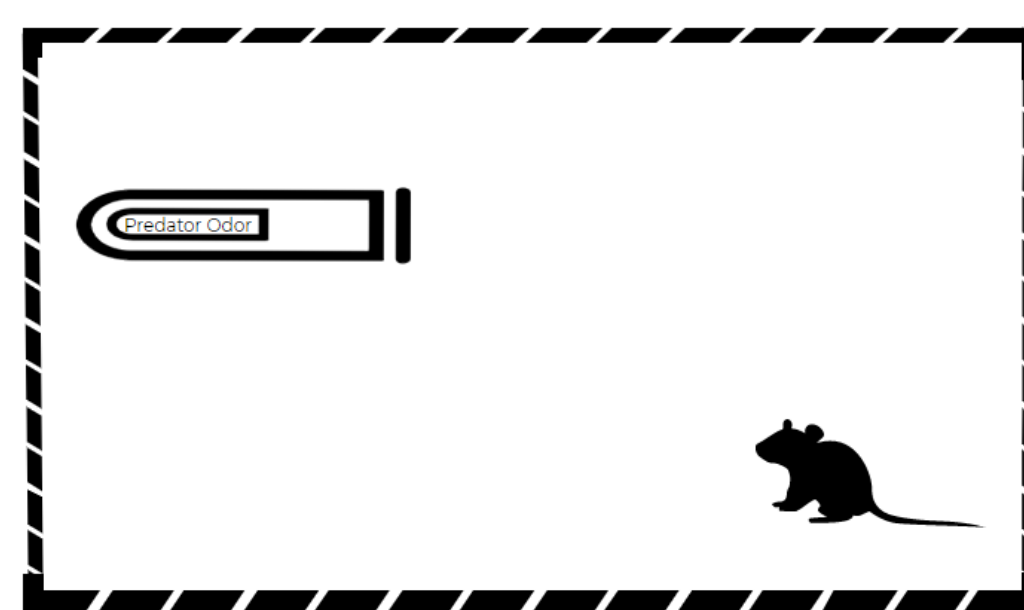
- Repeated Variate Social Stress (RVSS)** as an acute model of stress
 - Witness Restraint**



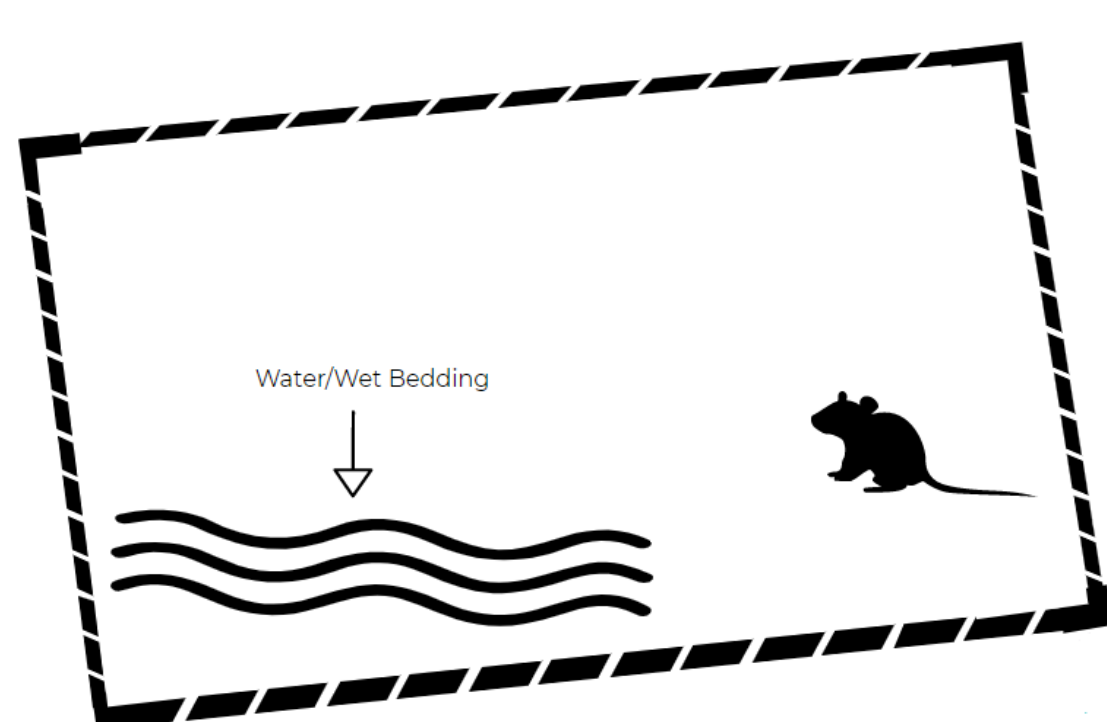
Overcrowding



Predator Odor

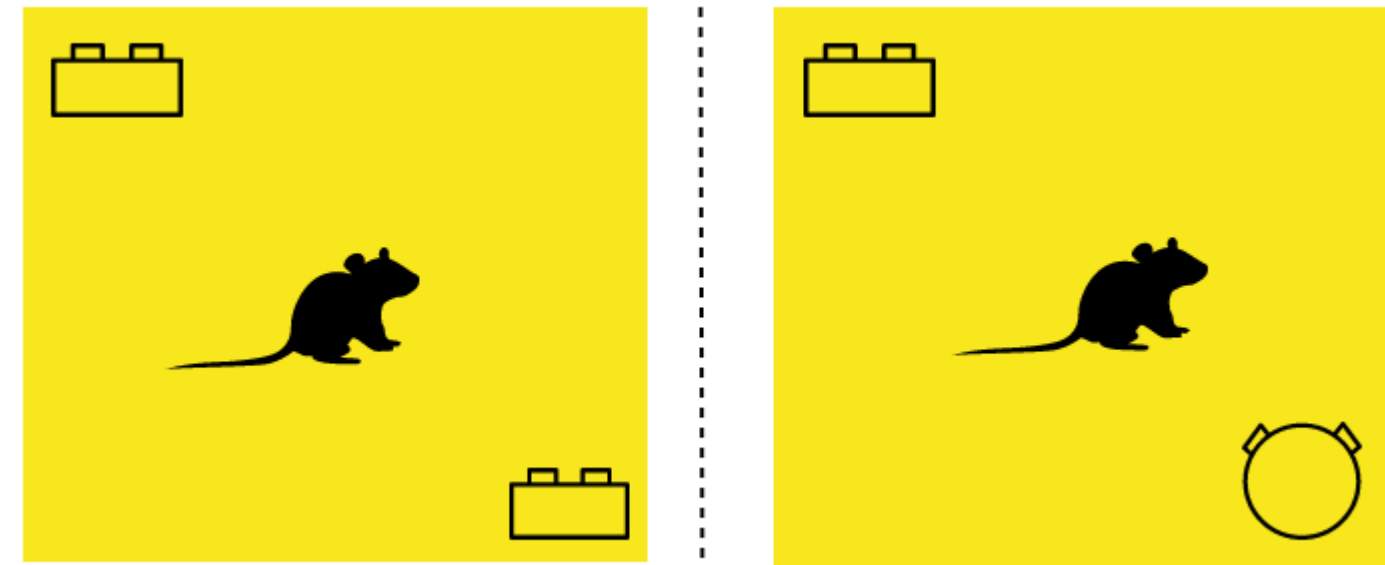


Home Cage Instability

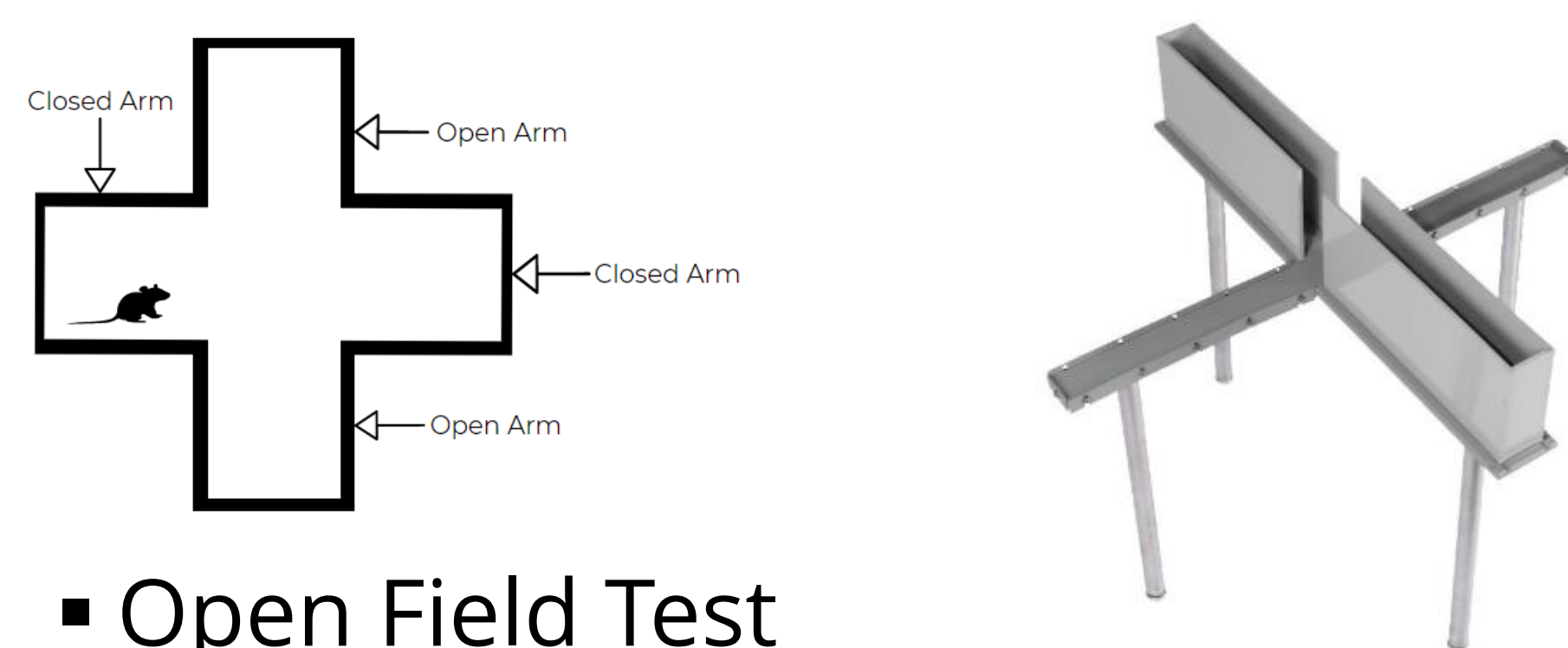


Results

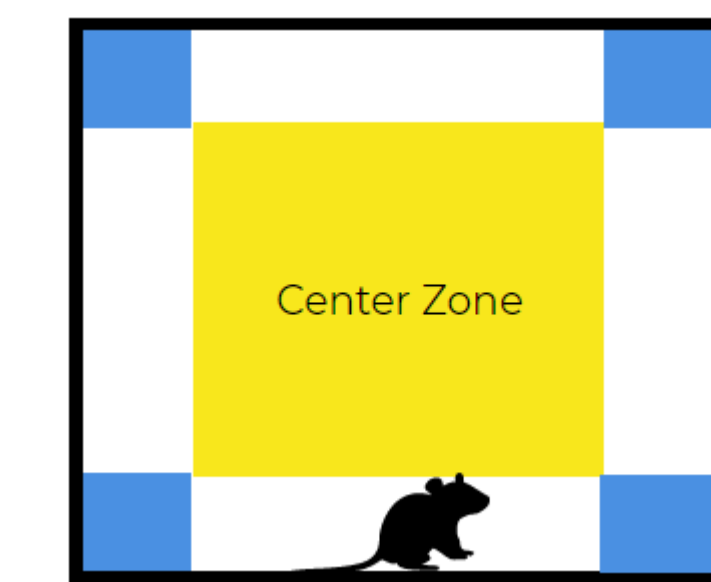
Novel Object Test



Elevated Plus Maze



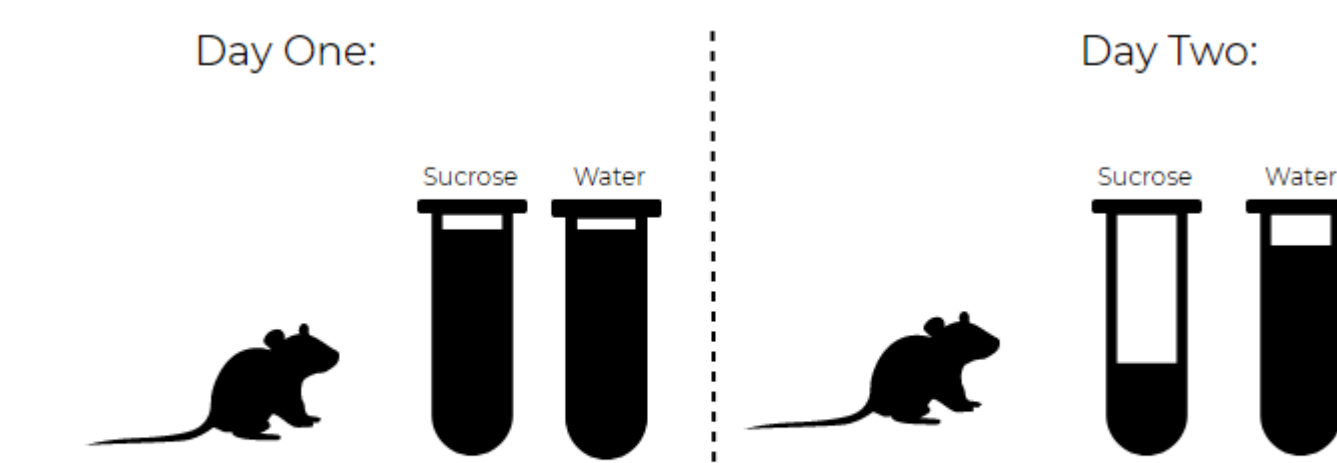
Open Field Test



Sucrose Test



Sucrose Preference Test



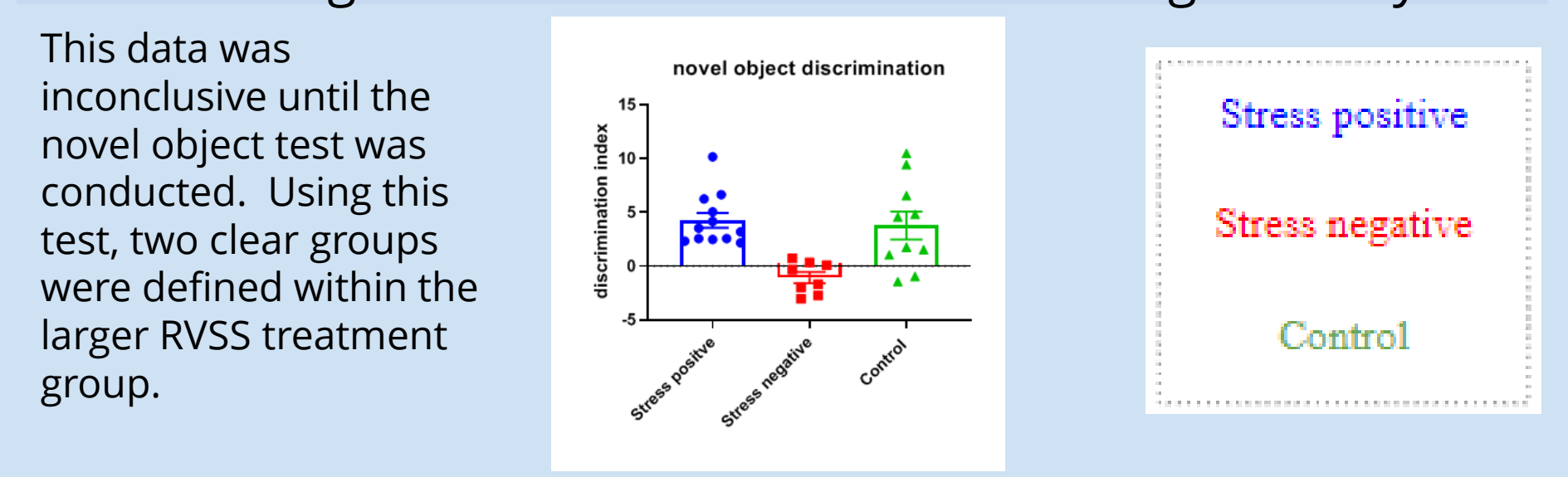
Male and Female Interaction Tests



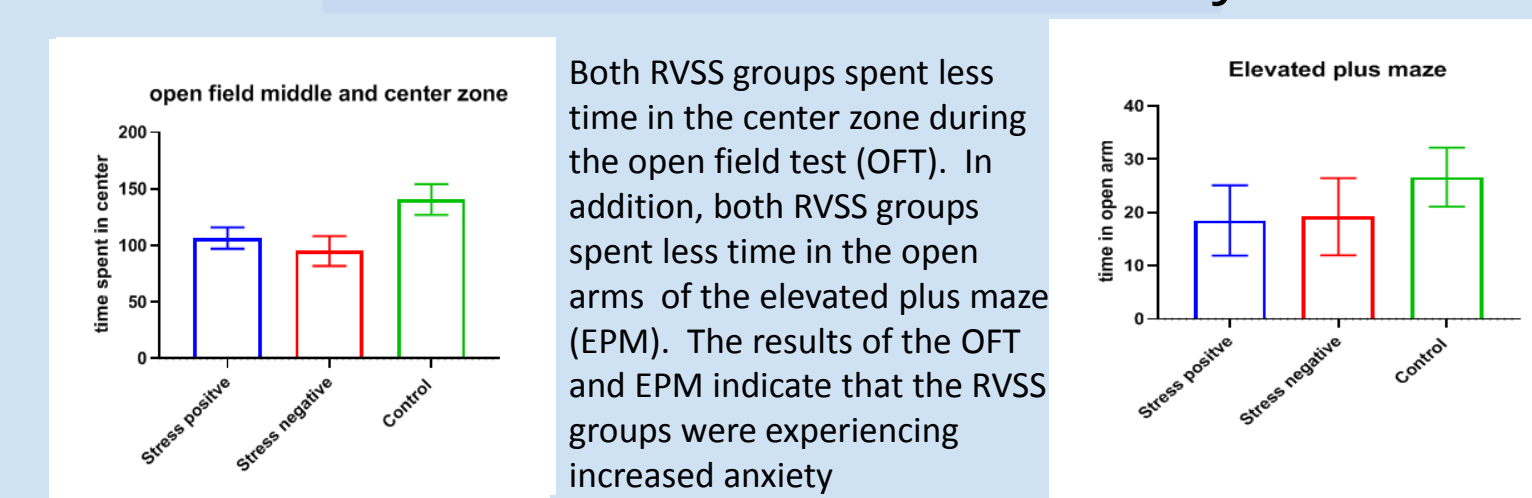
The original design of this experiment did not include these increased reward seeking behavior tests. However, after seeing a better performance on the social interaction tests, these tests were conducted. These tests indicate that because of the diminished anxiety on the social interaction tests, that these mice were employing stress coping techniques. In addition, the reason the mice were not experiencing stress during these tests was that these tests were actively "curing" them of anxiety.

- The mice participated in a series of **behavior tests** which indicate how the mice responded to RVSS treatment
- It is important to keep in mind that mice can not be diagnosed with depression or anxiety. However, these tests are able to best represent and express a mouse's "mental health"
- The data was unclear until the two experimental groups were split by the **working memory test**
 - Increased reward seeking behavior tests** were carried out to determine if **coping mechanisms** were employed

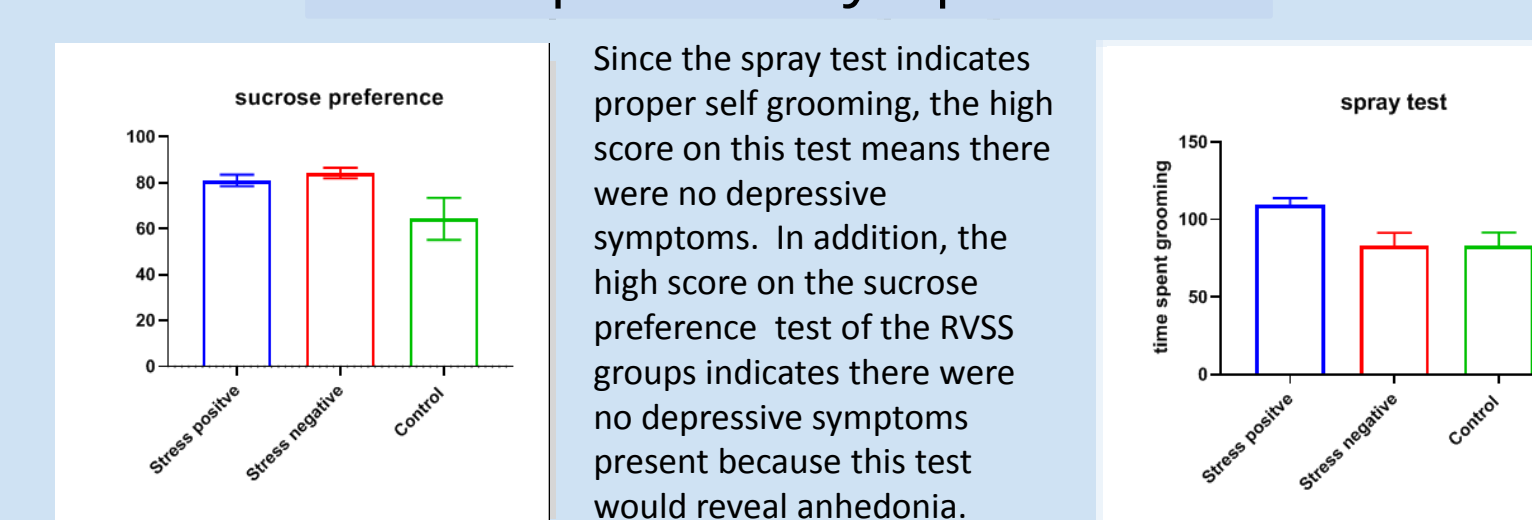
Stress negative mice had decreased working memory:



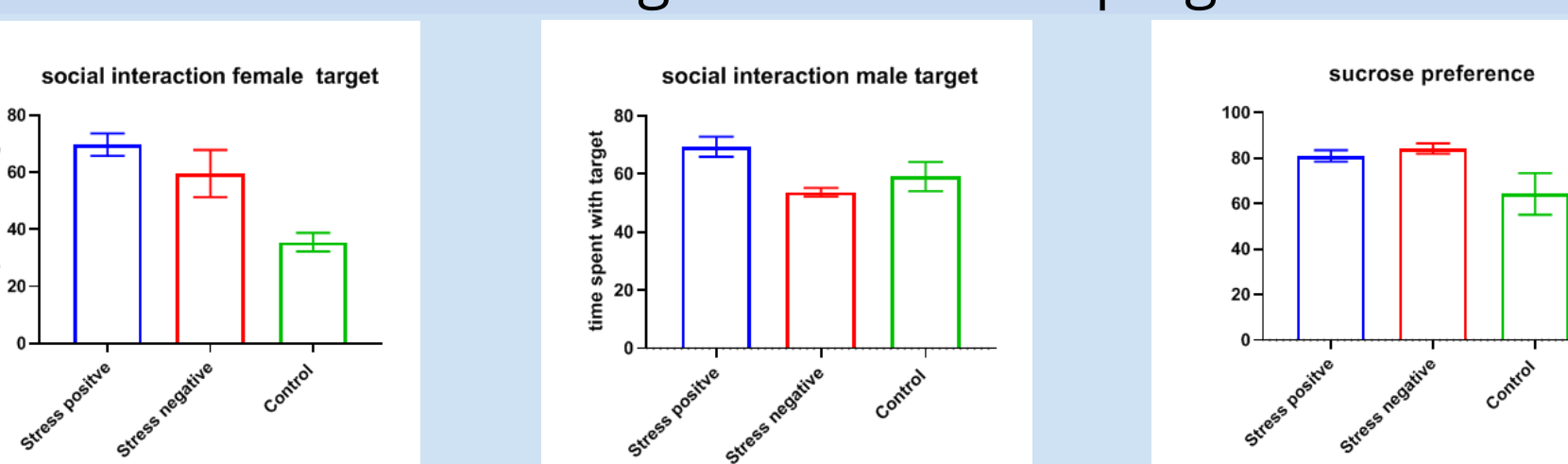
RVSS induces mild anxiety:



No depressive symptoms:



Increased reward seeking behavior as coping mechanisms:



Conclusion

- Two ways to interpret the data**
 - RVSS induced resilience**
 - Certain behavior tests acted as stress coping mechanisms**
- With the increased reward seeking tests, it is clear that the RVSS mice used **coping mechanisms** which then allowed them to perform above the control group
 - Social buffer**
 - Binging habits**
 - Self care and grooming**
- Translational to **human behaviors**:
 - Binging
 - Increased drug and alcohol reliance
 - Support groups
 - Therapy sessions

Future Research

- Males vs Females?
- Aggression exhibited in males
- Cortisol levels and changes in blood
- mPFC connection to the VTA
 - Electrophysiology



- More effective treatments for stress disorders**

- Implementation within drug rehabilitation centers and programs

Bibliography

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