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Rewarding Properties of Social Defeat

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Introduction

Conditioned place preference (CPP) is a classical conditioning paradigm used to evaluate the rewarding or aversive properties of a stimulus. A stimulus can be an audio, visual, or sensory prompt but can also be stimuli associated with behaviors. Environments associated with sexual and aggressive encounters can become rewarding to both male and female Syrian hamsters. However, we have observed that individually-housed, non-aggressive hamsters also find social interaction without aggression or sexual behaviors rewarding.

Hypothesis

Group-housed, male Syrian hamsters (n=12) can develop a preference for a negative experience such as social defeat when being paired with an aggressive and/or dominant social partner.

Methods

Time Course	Procedures	Diagrams
2 Weeks	34 Hamsters (Individually-Housed) 38 Hamsters (Group-Housed)	
Day 1	Pretest 1: First 15-minute preference test for group-housed subjects.	
Day 2	No Testing	
Day 3	Pretest 2: Second 15-minute preference test for group-housed subjects.	
Day 4	No Testing	
Day 5	No Testing	
Day 6-10	Conditioning: An individually-housed male was paired with a group-housed male in their non-preferred chamber for 10 minutes.	
Day 11	No Testing	
Day 12	Post Test: Final 15-minute preference test for group-housed subjects.	

Results

Data Analysis & Statistics

Preferred Chamber: PC, Non- Preferred Chamber: NPC, Neutral Chamber: NC

Preference Score: (time in NPC/time in preferred PC)+ time in NPC

Difference score : time in PC - time in NPC

Clear Score: average time in NC

Paired samples T-tests were used to compare differences between scores before and after conditioning.

One way Anova tests were used to compare behavioral data across conditioning trials.

CPP Data (Individually-Housed)

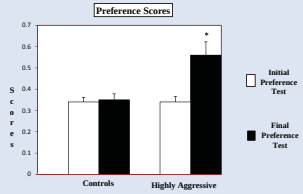

Fig. 1: Significant effect (*) of aggression on preference scores (p<0.05)

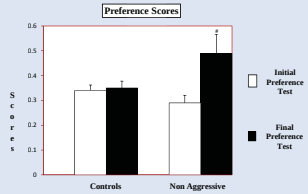

Fig. 2: Trend (#) towards an increase in preference scores on non-aggression on (p<0.10)

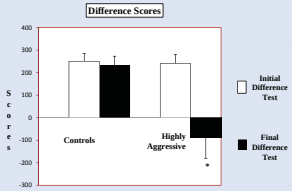

Fig. 3 : Significant effect (*) of aggression on preference scores (p<0.05).

CPP Data (Group-Housed)

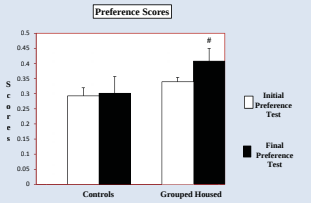

Fig. 4: Trend (#) towards an increase in preference scores on submission (p=0.086)

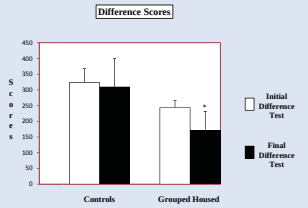

Fig. 5: Significant effect (*) of submission on difference scores (p<0.05)

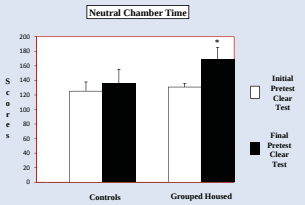

Fig. 6: Significant effect (*) of submission on neutral chamber duration (P=<0.05)

Behavioral Data (Group-Housed)

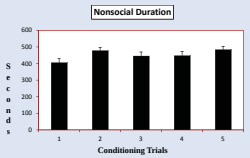

Fig. 7: Significant difference in levels of nonsocial duration over conditioning trials (p<0.05)

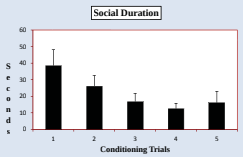

Fig. 8: Significant difference in the levels of social duration over conditioning trials (p=<0.05)

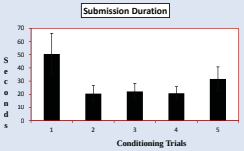

Fig. 9: Trend towards a decrease in the levels of submission duration over conditioning trials (P=<0.099)

Conclusion

Our hypothesis that group housed, male Syrian hamsters develop a preference for social defeat despite being paired with an aggressive and/or dominant social partner was rejected by our results.

Our previous and current research indicates that Syrian hamsters, despite being solitary animals, formed a CPP for social defeat regardless of social(aggressive/submissive) and housing(group/individual) status.

Our data suggest that the experiment conducted produced a combination of mild social defeat with novel interactions that produced less aversion and perhaps lower generalized anxiety which was sufficient to produce a CPP for social defeat in male Syrian Hamsters.

Future Experiments

Conduct a variety of social defeat experiments and aggressor pairings that is rational and realistic representation of biological and sociological stress on social behavior.

Understanding the neurobiology of social stress and how anxiety & stress influences future behaviors and sociality.

Identifying the neural substrates of social reward:

- Mesolimbic dopamine system
- Vasopressin system (limbic areas)
- Oxytocin system (limbic areas)

References

Huhman, K., Solomon, M., Janicki, M., Harmon, A., Lin, S., Israel, J., & Jasnow, A. (2003). Conditioned defeat in male and female Syrian hamsters. Hormones & Behavior, 44(3), 293-299.

Huhman, K. L. (2006). Social conflict models: Can they inform us about human psychopathology?. Hormones & Behavior, 50(4), 640-646.

Douglas, L., Varlinskaya, E., & Spear, L. (2004). Rewarding properties of social interactions in adolescent and adult male and female rats: impact of social versus isolate housing of subjects and partners. Developmental Psychobiology, 45(3), 153-162.

McCann, K. E., & Huhman, K. L. (2012). The effect of escapable versus inescapable social defeat on conditioned defeat and social recognition in Syrian hamsters. Physiology & Behavior, 105(2), 493-497.

Meisel, R.L., & Joppa, M.A. (1994). Conditioned place preference in female hamsters following aggressive or sexual encounters. Physiology & Behavior, 56, 1115-1118.