

INVESTIGATING DARTING RESPONSES DURING ACTIVE AVOIDANCE LEARNING IN
RATS

by

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Bachelor of Science in Psychology with minors in Animal Science and Leadership Studies

A FINAL HONORS PROJECT

submitted in accordance with the University Honors Program requirements

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KANSAS STATE UNIVERSITY
Manhattan, Kansas

December 2025

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Abstract

Previous research has shown that anxiety-related disorders, like Obsessive Compulsive Disorder (OCD), social anxiety, and Post Traumatic Stress Disorder (PTSD), affect women more than men. Excessive fear and avoidance are common symptoms of these disorders, and studying these behaviors in rodents helps us gain a better understanding of these maladaptive behaviors. In rodent studies, fear responses are typically measured with “freezing,” depicted by no movement except for breathing. However, recent research has identified another fear-related behavior called “darting”, which is characterized by a rapid movement across the chamber reaching a velocity of greater than 23.5 cm/s and lasting a maximum of 1 second. Studies have reported that female rats exhibit four times more darting than male rats during fear conditioning, but this behavior has not yet been studied in the context of active avoidance tasks. In our lab, we use the platform-mediated active avoidance task (PMA) in which a rat learns to avoid a tone-signal footshock by stepping onto a safe platform while also forgoing access to a food reward across 10 days of training. Most prior studies have used the PMA task when the animal learns alone. Our lab has recently modified this task to include a social condition where rats can learn the task together in a chamber divided by a transparent barrier, which is called social partner PMA. Each rat has access to their own platform, lever, and food dish. The main goal of my project was to determine whether darting is a common response under social vs. solitary PMA conditions and if females also exhibit darting more than males during PMA. Additionally, I assessed whether darting was correlated with other behaviors during PMA, such as freezing, time on the platform during the tone, and lever-pressing during the ITI.