

**Title:**

The Effects of Moderate Prenatal Alcohol Exposure on Navigation in a Delayed Non-Match-To-Place Spatial Alternation Task by Adult Male and Female Rats

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**Abstract:**

Prenatal Alcohol Exposure (PAE) has been found to result in structural alterations to regions of the brain involved in spatial memory, including the thalamus and hippocampus. Previous studies have shown that spatial memory is impaired after moderate PAE (mPAE; ~60-80 mg/dL) and damage to the limbic thalamus and hippocampus. Recent work has shown that visual-spatial discrimination memory is impaired after mPAE in a sex-specific manner such that female mice exhibit greater deficits after 15sec retention intervals. It is unclear whether similar-sex specific deficits would be observed in tests of spatial memory or in a rat model of mPAE. Thus, the present study tested the hypothesis that mPAE would produce sex-specific deficits in a delayed non-match-to-place variant of a spatial alternation task. Saccharine (n=8; 4 female and 4 male) and mPAE (n=8; 4 female and 4 male) adult Long-Evans rats were trained to alternate from a reference point to the outbound arms of an M-maze. Animals were required to encode recently learned spatial cues during the initial trajectory and subsequently recall their initial trajectory after a 15sec retention interval. After the delay, rats navigated to the opposite (alternate) arm for a food reward. Rats performed 10 training trials each test day. The behavioral measures of task performance were quantified by accounting for the number of errors in each session of 10 trials in addition to the number of sessions until the criteria were met (criteria = 90% correct for two consecutive days). After criteria was met, rats were given two probe tests in which the delay was randomly varied between 15sec and 30sec. Preliminary results indicate that mPAE did not specifically impair performance, however female rats were generally slower to reach criteria. The results of the study suggest that this task variant is sensitive to sex differences in spatial behavior.

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