THE EFFECTS OF METHAMPHETAMINE AND COCAINE ON RATS’ Y-MAZE PERFORMANCE USING DIRECTIONAL VS. VISUAL CUES.

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Abstract
Two experiments in our laboratory have demonstrated that across a wide range of doses, amphetamine but not cocaine (COC) disrupts the discrimination performance of rats running toward the lighter arm of a Y-Maze. In these experiments we noticed that rats trained in the amphetamine group were repeatedly running in the same direction at least 20% of the time. Since amphetamine increases locomotor activity, the running behavior was hypothesized to be due to perseverative performance in one direction. The Y-Maze apparatus was used to test this hypothesis. In the present study, rats were trained in a Y-Maze apparatus that allowed for a directional response that would be compatible with perseverative responding. One group of rats (n=8) was trained to run to the light arm of the apparatus every time it was presented. A second group of rats (n=8) was trained to run to the dark arm of the apparatus every time it was presented. After training, all groups were tested with a second set of trials. The results were that the rats trained on the light arm of the apparatus were significantly more perseverative in their responses than the rats trained on the dark arm. The results were surprising as the MTH did not result in perseverative responding to the novel stimulus. Further studies are needed to determine what role the novel stimulus plays in these studies.

EXPERIMENT 1
Rationale and Goals
A previous experiment in our laboratory found that 4-methylamphetamine (MTH) but not cocaine (COC) disrupted discrimination performance in a Y-Maze. The study was interesting since both drugs have been shown to increase body weight inoperating in paradigms, and neither drug disrupted discrimination performance in a Y-Maze. The present study was designed to replicate and extend the previous research with the following goals: (1) to determine the effects of repetitive exposure to a novel stimulus on the Y-Maze apparatus. A second goal was to determine if the perseverative responses to the novel stimulus were due to either the novel stimulus or the Y-Maze apparatus. (2) To determine if the perseverative responses to the novel stimulus were due to either the novel stimulus or the Y-Maze apparatus.

Methods
Subjects
Female Sprague-Dawley hooded rats (n=12) with previous experience in either operant or straight alley maze experiments served as the experimental subjects. They were individually housed with free access to food and water except for 3 hr water deprivation prior to each session.ORE

Procedures
Two groups of rats (n=8) each had half maze and half chamber chambers. In both experiments, the drug-guage was held constant. In both experiments, injection volume (drug in saline vehicle) was scaled to body weight and was administered 15 min prior to the start of each session. Three sessions were used to allow sufficient time for the rats to respond in both arms. The rats were trained to run to the lighter arm of the maze for water reinforcement. The direction of the correct choice was randomly alternated in each arm session. At the end of the session, the rats were allowed to drink water. The rats were then transported to the home cage for 20 min. Water deprivation was maintained for the entire session. The rats were then trained to run to the dark arm of the maze for water reinforcement. The direction of the correct choice was randomly alternated in each arm session. At the end of the session, the rats were allowed to drink water. The rats were then transported to the home cage for 20 min. Water deprivation was maintained for the entire session. The rats were then trained to run to the dark arm of the maze for water reinforcement. The direction of the correct choice was randomly alternated in each arm session. At the end of the session, the rats were allowed to drink water. The rats were then transported to the home cage for 20 min. Water deprivation was maintained for the entire session. The rats were then trained to run to the dark arm of the maze for water reinforcement. The direction of the correct choice was randomly alternated in each arm session. At the end of the session, the rats were allowed to drink water. The rats were then transported to the home cage for 20 min. Water deprivation was maintained for the entire session.

Results
The results of Experiment 1 showed that the rats trained to run to the light arm of the maze were significantly more perseverative in their responses than the rats trained to run to the dark arm. The results were surprising as the MTH did not result in perseverative responding to the novel stimulus. Further studies are needed to determine what role the novel stimulus plays in these studies.