EFFECTS OF A RANGE OF AMPHETAMINE EXPOSURE DOSES ON DEVALUATION TESTING WITH MISTMATCHED TRAINGING-TEST CUES IN MALE RATS

by

TRAVIS HODGE

Majors in Nutritional Sciences and Psychology, Secondary Major in Gerontology

A FINAL HONORS PROJECT

submitted in accordance with the University Honors Program requirements

Department of Psychological Sciences
College of Arts and Sciences

KANSAS STATE UNIVERSITY
Manhattan, Kansas

May 2021

Approved by:

Charles Pickens

Abstract

Past evidence shows that drug use may impair decision-making ability. The specific nature of this relationship and direction of its causality are unclear, however, there is evidence to support that chronic amphetamine (amp) use could affect decision-making processes. Animal models are a controlled way to assess issues of this causality. Amp is a dopamine agonist which stimulates the CNS and is a treatment for ADHD. Therefore, chronic administration of amp can model the chronic use of stimulants in humans. This has important implications because one of the most commonly prescribed stimulants, Adderall, is essentially pharmaceutical grade amphetamine. People sometimes take these stimulants for long periods of time which is why we wanted to see if they have long-term effects on decision-making. In order to examine this relationship, rats were tested in a devaluation procedure following the chronic administration of amphetamines. Devaluation tasks are used to model flexible goal-directed decision-making. The devaluation task used in this study involved rats learning to pair two dissociable lever-light compound cues with different food outcomes. One outcome was then devalued using selective satiety, reducing motivation for a specific food reward by unlimited consumption of that particular food. Devaluation is successful if rats no longer respond to obtain the devalued reward after being presented the cue. Our results suggest that chronic administration of amp exposure appears to have lasting impairments on decision making. These impairments were only found during behavioral testing and not training. This suggests that the brain areas involved are likely the orbitofrontal and prelimbic cortex, as they are related to impairments in devaluation effects. This study has implications because it's results could be related to those who consume ADHD medication on a daily basis. Future research will include the addition of more rats to see if the same effects are found. If so, perfused brains will undergo Fos examination.