

# Environmental Enrichment Reduces Stress-Induced Relapse Over Protracted Withdrawal Periods in Ethanol Taking Rats

Makenzie Schrader, Amanda Shaw, Elizabeth Claire Toal and Dr. Joshua Alan Peck  
Department of Psychology, State University of New York at Cortland

## Introduction

- ❖ Although medications for alcohol addiction show promise compared to no treatment in reducing alcohol use, it continues to fall short of being highly effective when the goal is long-term abstinence.
- ❖ One potential treatment strategy to support long-term alcohol abstinence is Environmental Enrichment (EE).
- ❖ A common animal model used to study the alcohol addiction cycle of bingeing, abstinence, and relapse is the abstinence model.
- ❖ The abstinence model consists of three phases: self-administration, forced abstinence (forced removal from the drug context), and relapse (placed back into the drug context).
- ❖ The present studies sought to determine if the implementation of EE after ethanol self-administration training will reduce or eliminate continued ethanol consumption (abstinence) and protect against stress-induced relapse using the abstinence model.

## Research Design

| Exp. 1   | Phase 1            | Phase 2                        | Phase 3      |
|----------|--------------------|--------------------------------|--------------|
| Phase    | SA of Ethanol (6%) | Forced Abstinence (EE vs. NEE) | Relapse Test |
| Duration | 12 Days            | 7 or 30 days                   | 1 hour       |

| Exp. 2   | Phase 1            | Phase 2                        | Phase 3                       |
|----------|--------------------|--------------------------------|-------------------------------|
| Phase    | SA of Ethanol (6%) | Forced Abstinence (EE vs. NEE) | Relapse Test (Stress-Induced) |
| Duration | 12 Days            | 7 or 30 Days                   | 1 hour                        |

## Methods

### Experiment 1.

- ❖ Oral Self-administration (SA) phase: 24hr access to 6% ethanol for 12 days for both EE and NEE rats.
- ❖ Abstinence Phase: EE rats (n=10) placed in enrichment chambers for 7 or 30 days without access to ethanol. NEE rats (n=10) placed in standard cages for 7 or 30 days without access to ethanol.
- ❖ Relapse Phase: Both EE and NEE rats were placed back in the drug context and given access to ethanol for 1 hour.



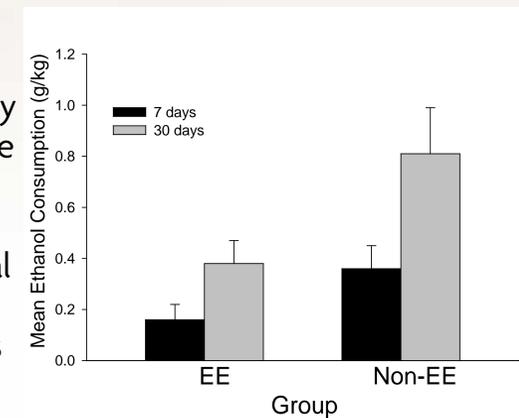
### Experiment 2.

- ❖ The procedure was a replication of Experiment 1. except for after the abstinence phase (7 or 30 days) both EE and NEE rats were placed in stress restraint cylinders for 30 minutes before the relapse tests.

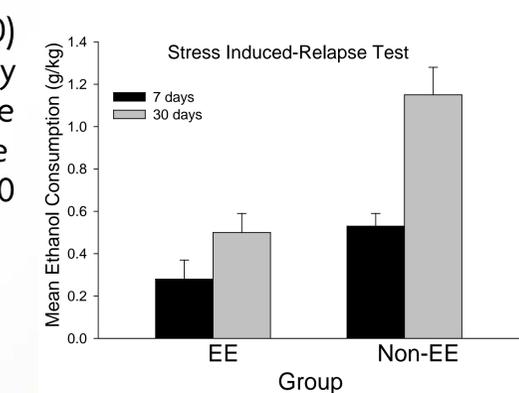


## Results

- ❖ For **Exp. 1** we found that EE rats (n=10) consumed significantly less ethanol during the relapse tests for both 7 and 30 day protracted withdrawal periods when compared to NEE rats (n=10).



- ❖ For **Exp. 2** EE rats (n=10) consumed significantly less ethanol during the stress-induced relapse tests for both 7 and 30 day protracted withdrawal periods when compared to NEE rats (n=10).



## Conclusion

- ❖ Collectively, the results suggest that enriched life conditions are important in facilitating long-term abstinence and preventing relapse in alcohol addiction.

