



INTRODUCTION

- Ethanol, the type of alcohol that is consumable, is the most used and abused recreational drug among young people in the US. In 2018, the National Survey on Drug Use and Health Youth reported 19% of youth aged 12 to 20 years old drink alcohol.
- Preclinical studies show inconsistent results for ethanol-induced conditioned place preference (CPP) in adolescent rats, with some studies even failing to show ethanol-induced CPP (Philpot et al., 2014, *Behav Brain Res*, 262; Torres et al., 2014, *Alcoholism: Clinical and Exp Res*, 38).
- A previous study in our lab demonstrated ethanol-induced CPP in adolescent rats with a low dose of 0.125 g/kg, suggesting that lower doses may be necessary to examine ethanol preference in adolescents.
- The goal of the current study is to examine the hypothesis that low doses of ethanol are central for adolescent rats to exhibit a preference for ethanol.

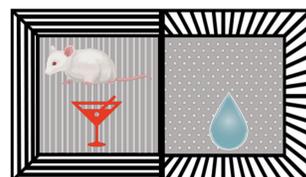
METHODS

- Male and female Sprague-Dawley rats (Charles River, Hollister CA) were bred and raised at CSULB. Animals were housed 2/3 per cage and kept on a 12:12 light/dark cycle with free access to food and water.



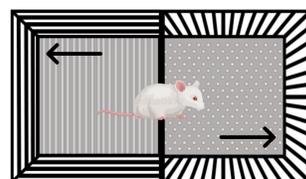
Preconditioning Test (PD 31)

Day 1: Free access to both sides of the chamber for 20 min



Conditioning (PD 32-39)

Day 2-9: **Ethanol** (0.0, 0.0156, 0.0313, 0.0625, 0.125, 0.5, 2.0 g/kg) or **saline** on alternating days for 15 min

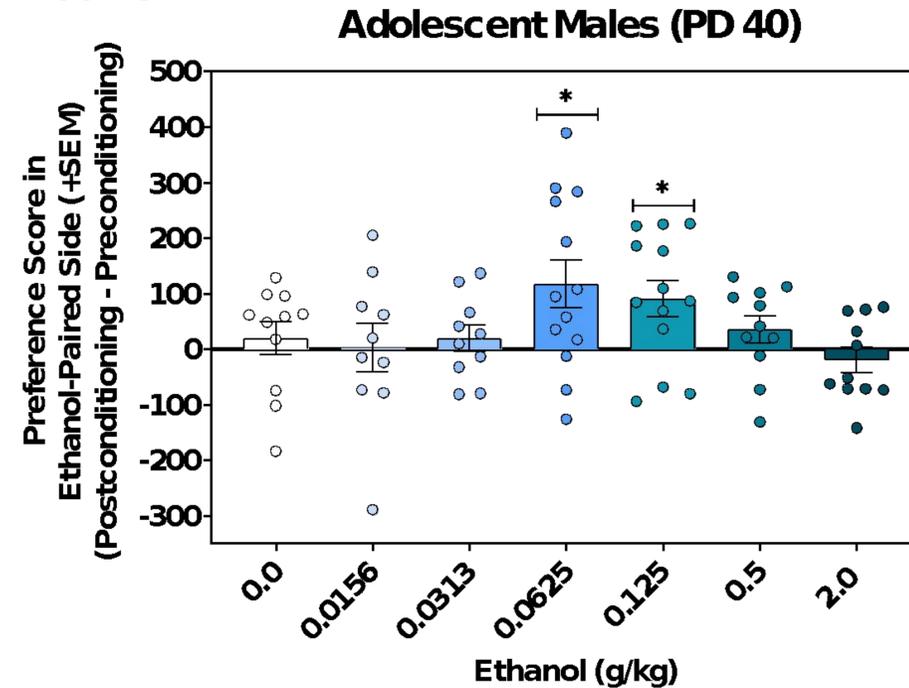


Postconditioning Test (PD 40)

Day 10: Free access to both sides of the chamber for 20 min

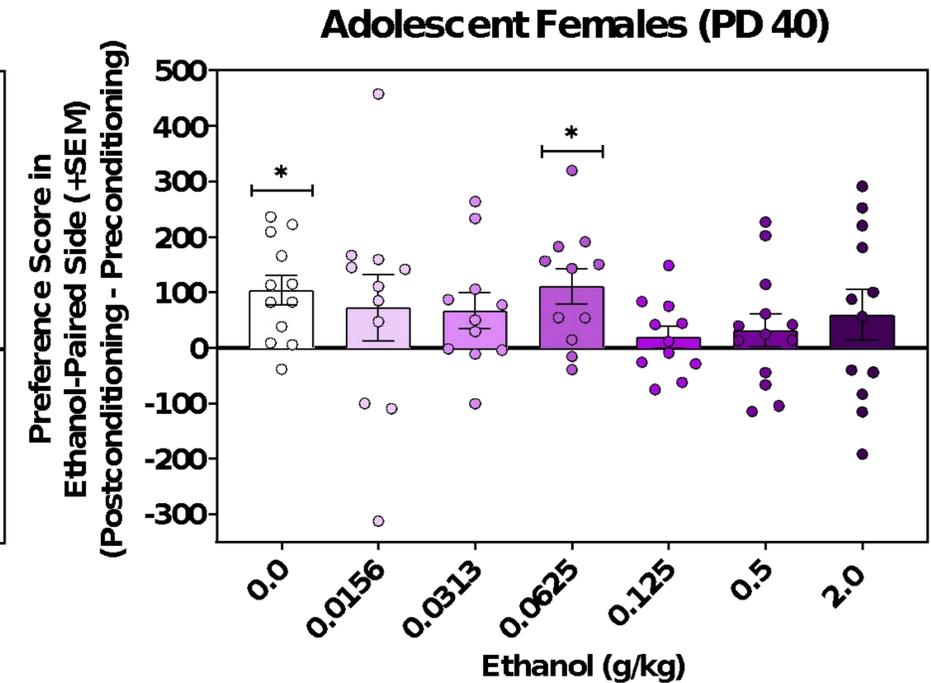
- The dependent variable is presented as a preference score (postconditioning time - preconditioning time in the ethanol paired side). CPP is defined as having a significantly higher preference score in comparison to the expected value of 0 (i.e. no change between the postconditioning and preconditioning sessions), which was assessed using planned comparisons.

RESULTS



Adolescent male rats demonstrated a significantly higher preference score relative to 0 when administered low doses (0.0625 g/kg and 0.125 g/kg) of ethanol.

* Represents a significant difference from an expected preference score of zero ($P < .05$)



Adolescent female rats demonstrated a significantly higher preference score relative to 0 when administered the low dose (0.0625 g/kg) of ethanol and saline (0.0 g/kg).

* Represents a significant difference from an expected preference score of zero ($P < .05$)

SUMMARY AND CONCLUSIONS

- Adolescent males demonstrated ethanol-induced CPP when using low doses of ethanol (0.0625 g/kg and 0.125 g/kg), furthering the hypothesis that using low doses may be crucial when studying ethanol reward in adolescents.
- In contrast, the data for adolescent females is more difficult to interpret, because rats in both the saline (0.0 g/kg) and low dose (0.0625 g/kg) of ethanol groups showed significantly higher preference scores. Thus, it is unclear whether the increase in preference in ethanol pretreated rats is attributed to ethanol or random changes in the time spent on the ethanol paired side. The variability in the female data may be ascribed to fluctuating hormones, given that the age period we chose coincides with the development of gonadal hormones (Bell, 2018, *Endocrinology*, 159) which may affect explorative behaviors.
- Overall, these results suggest that low doses of ethanol are necessary to produce ethanol-induced CPP, at least in adolescent male rats, and highlight sex differences in the preference for ethanol. Preclinical animal models that allow for the examination of ethanol preference creates a better understanding of the underlying neurobiological mechanisms involved in adolescent substance abuse.

ACKNOWLEDGEMENTS

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