

Binghamton University

## The Open Repository @ Binghamton (The ORB)

---

Research Days Posters Spring 2020

Division of Research

---

2020

### Effects of Prenatal Methadone Exposure on Ethanol Intake in Adult Sprague Dawley Offspring

Michelle Montero

*Binghamton University--SUNY*

Follow this and additional works at: [https://orb.binghamton.edu/research\\_days\\_posters\\_spring2020](https://orb.binghamton.edu/research_days_posters_spring2020)

---

#### Recommended Citation

Montero, Michelle, "Effects of Prenatal Methadone Exposure on Ethanol Intake in Adult Sprague Dawley Offspring" (2020). *Research Days Posters Spring 2020*. 56.

[https://orb.binghamton.edu/research\\_days\\_posters\\_spring2020/56](https://orb.binghamton.edu/research_days_posters_spring2020/56)

This Book is brought to you for free and open access by the Division of Research at The Open Repository @ Binghamton (The ORB). It has been accepted for inclusion in Research Days Posters Spring 2020 by an authorized administrator of The Open Repository @ Binghamton (The ORB). For more information, please contact [ORB@binghamton.edu](mailto:ORB@binghamton.edu).



# Effects of Prenatal Methadone Exposure on Ethanol Intake in Adult Sprague Dawley Offspring

Michelle Montero, Marvin R. Diaz

Psychology Department and Center for Development and Behavioral Neuroscience

Binghamton University, Binghamton, NY, USA

BINGHAMTON  
UNIVERSITY



## Background

- In recent years, there has been a tremendous increase in opioid usage resulting in a nationwide epidemic. Opiate drugs like methadone have been routinely used as a substitute therapy for opioid use disorder in expecting mothers<sup>1</sup>
- This exposure may have detrimental effects on offspring as the placenta and fetal brain are permeable to opiate drugs<sup>2</sup>
- Studies have found that early drug exposure is a predisposing factor for increased basal and stress-induced alcohol consumption<sup>3</sup>
- Since prenatal opioid exposure has been linked to heightened stress reactivity, investigating the effects of prenatal methadone exposure (PME) on basal and stress-induced alcohol consumption in adulthood is important.

**Objective:** Determine whether Prenatal Methadone Exposure (PME) alters basal and stress-induced alcohol consumption in adulthood.

## Methods

### Prenatal Methadone Exposure

- Pregnant Sprague Dawley female rats were subcutaneously injected with either water or methadone twice daily from gestational day 3 to day 20.
- On day 3 the dosage administered was 5mg/kg and was increased to 7mg/kg from days 4-20

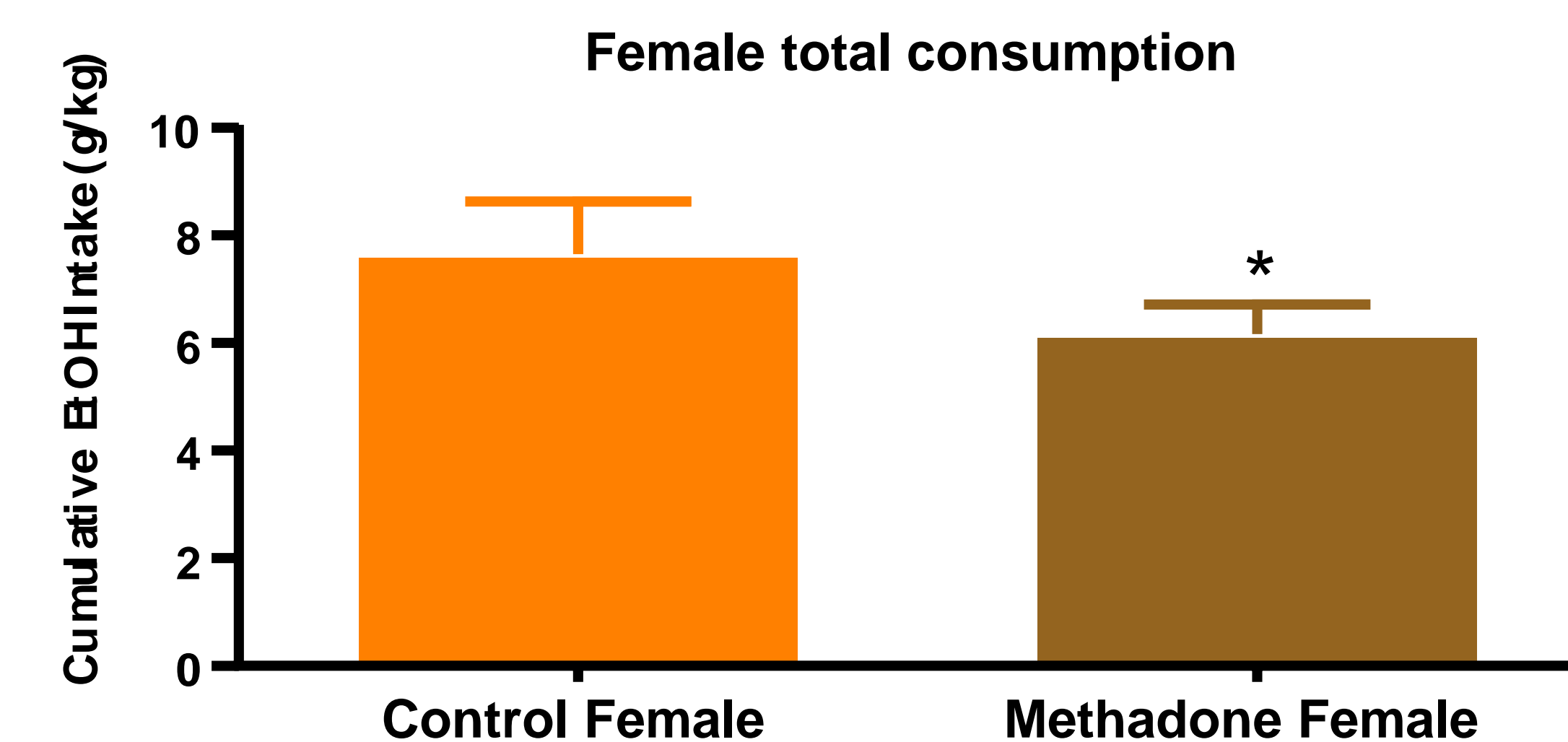
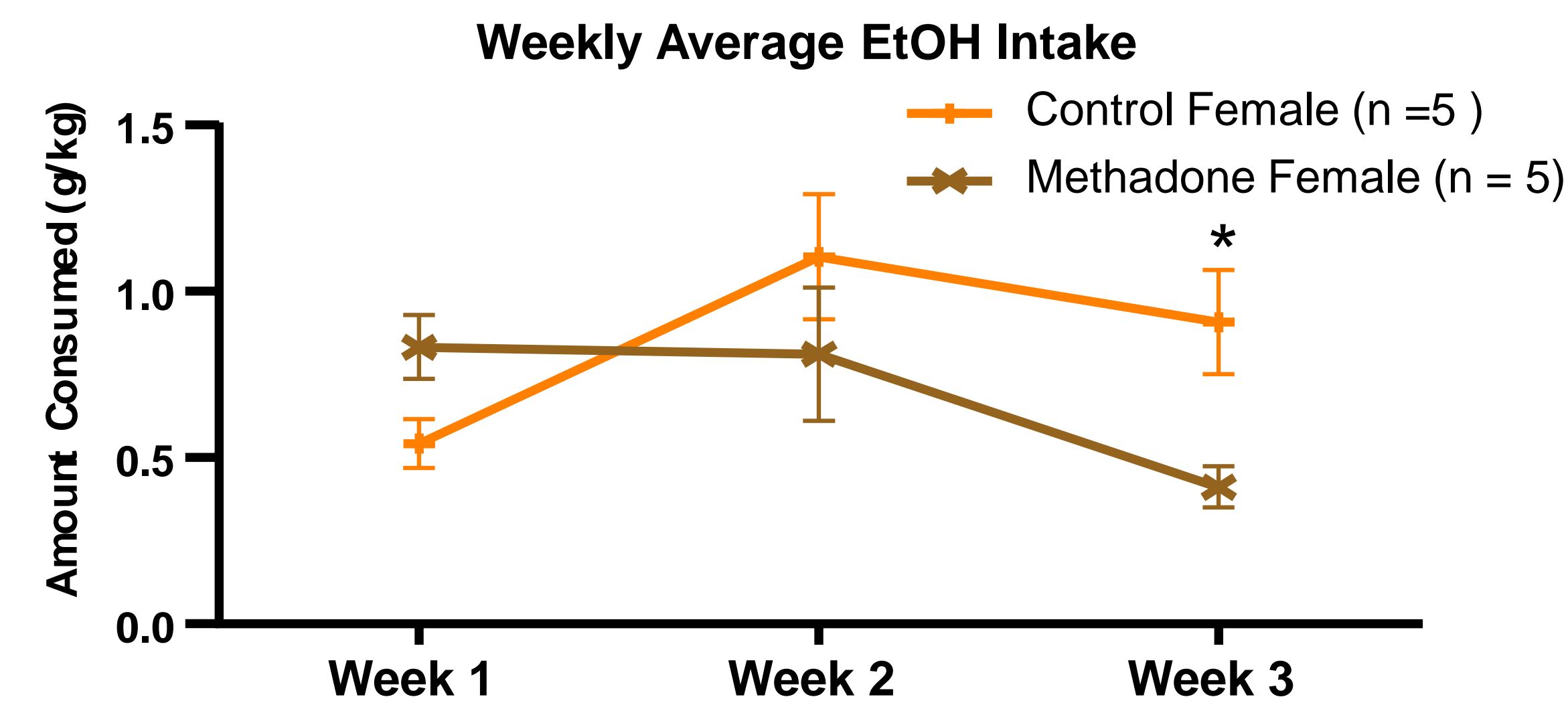
### Alcohol intake

- Adult (P70+) offspring were given 30 min access to an EtOH solution mixed with a sweetener (“supersac” – 10%, EtOH, 3 % sucrose, 0.12% saccharin) at the beginning of their dark cycle (0700) every MWF for 4 weeks

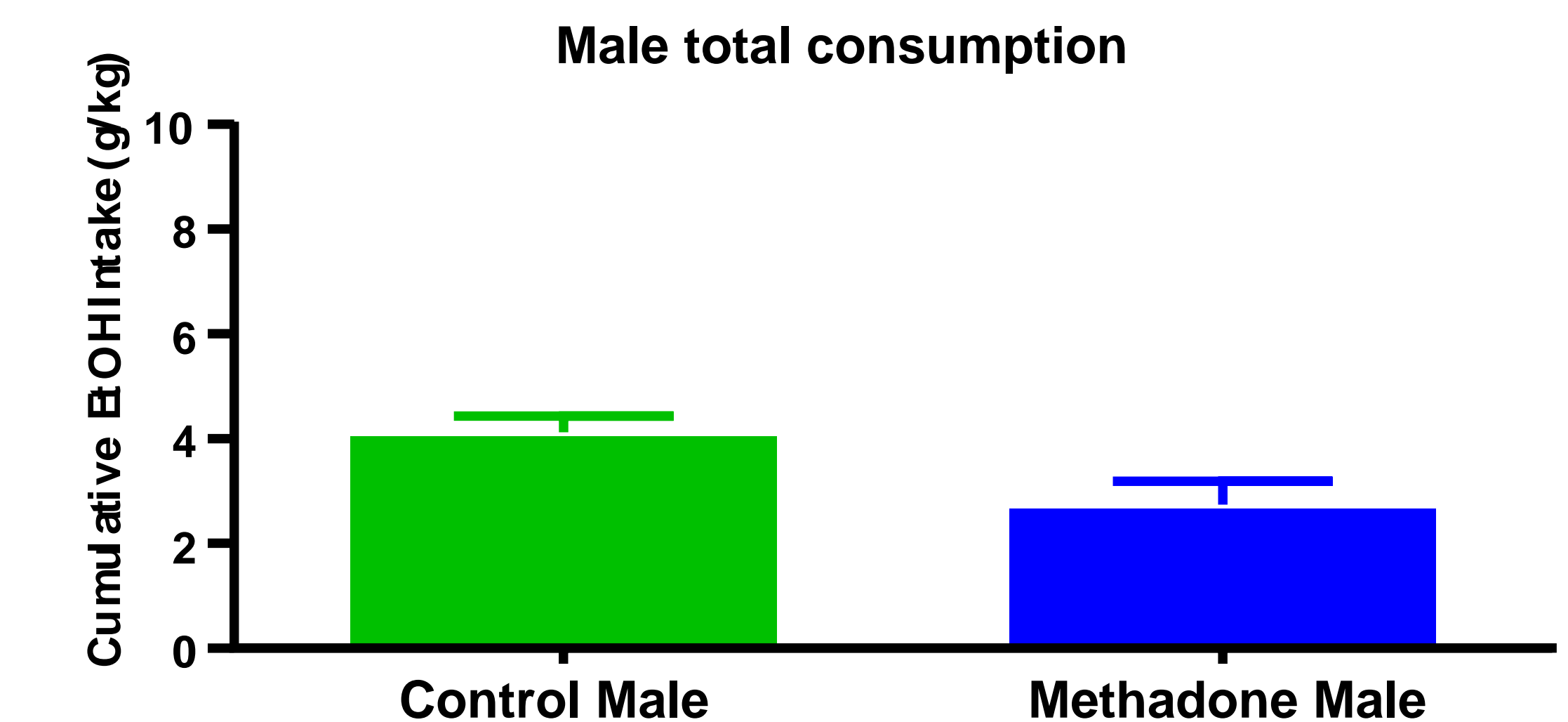
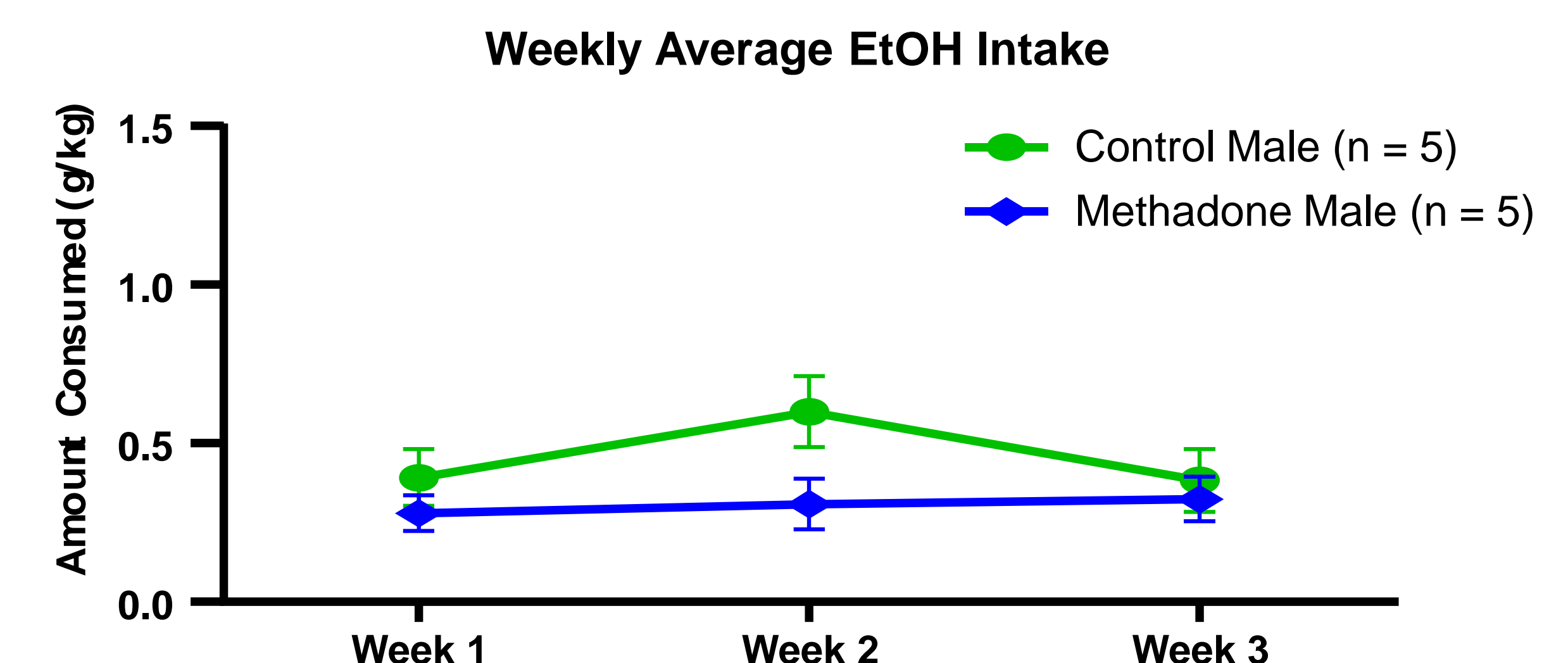
### Stress Exposure

- After 3 weeks of basal ethanol intake, animals were exposed to forced swim stress (FSS for 10 min), followed by a final drinking session ~10 hours later.

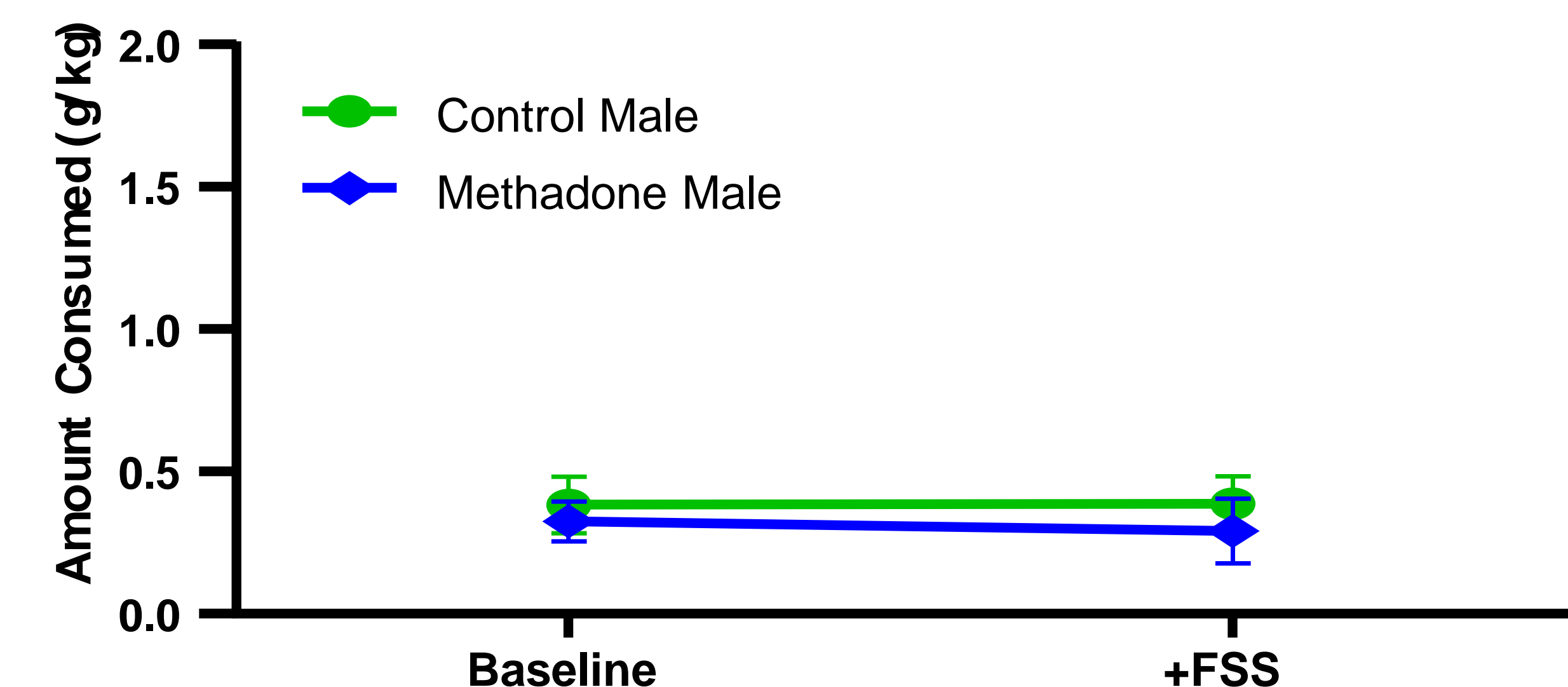
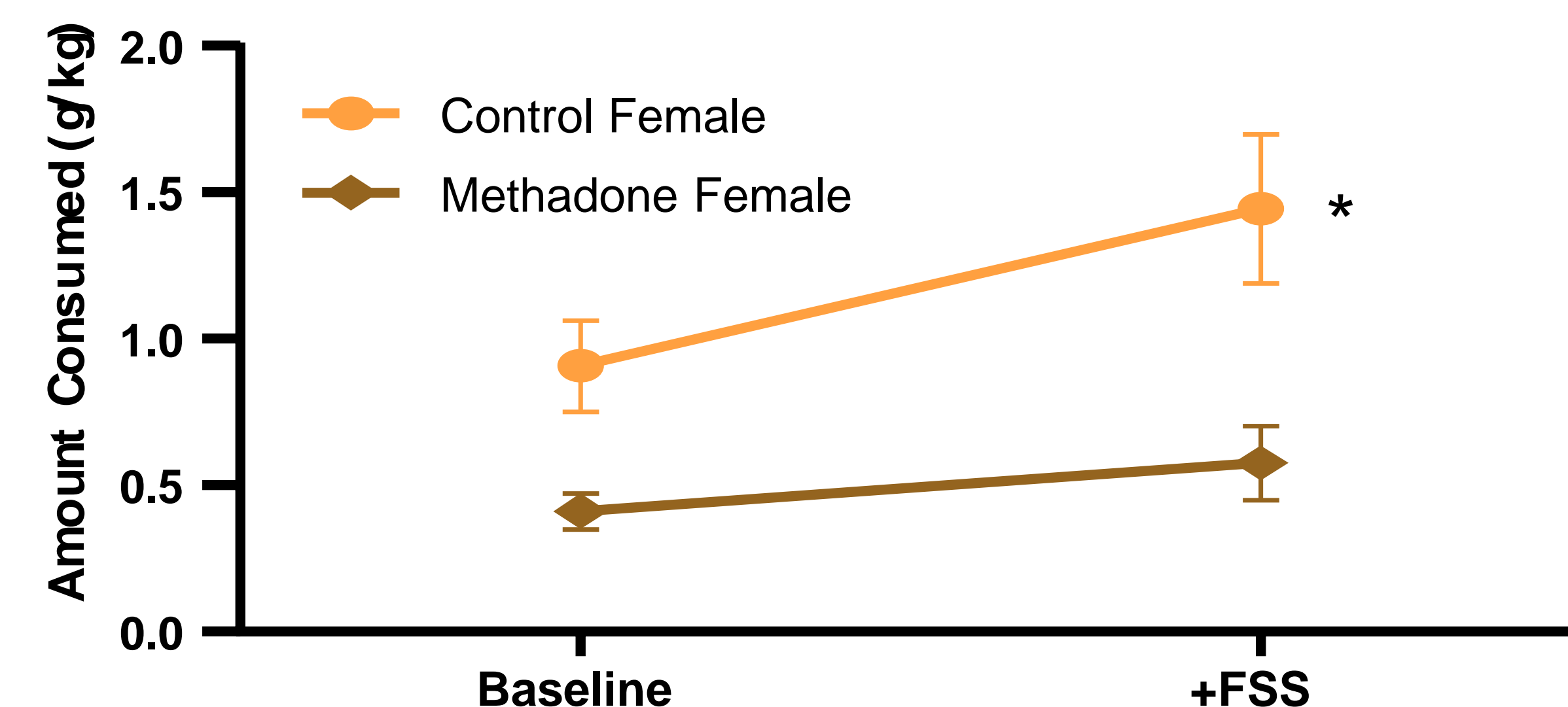
## 1. 10% Sweetened Ethanol Consumption in adult females following PME



## 2. 10% Sweetened Ethanol Consumption in adult males following PME



## 3. 10% Sweetened Ethanol Consumption in adult males and females following FSS



## Conclusions

- Preliminary results show that basal ethanol intake was significantly lower in methadone-exposed offspring compared to controls, regardless of sex.
- Stress exposure significantly increased ethanol consumption in control female offspring relative to their basal intake, an effect that was absent in control males and methadone-exposed females and males
- Together, these findings suggest that prenatal opioid exposure may have abating effects on basal and stress-induced alcohol consumption in adulthood.

## References

- Saia, K. *et al.* Prenatal treatment for opioid dependency: observations from a large inner-city clinic. *Addict Sci Clin Pract* 12, 5, doi:10.1186/s13722-016-0070-9 (2017).
- DeVane, C. L., Simpkins, J. W., Boulton, D. W., Laizure, S. C. & Miller, R. L. Disposition of morphine in tissues of the pregnant rat and foetus following single and continuous intraperitoneal administration to the mother. *J Pharm Pharmacol* 51, 1283-1287 (1999).
- Behnke, M., & Smith, V. C. Prenatal Substance Abuse: Short- and Long-term Effects on the Exposed Fetus. *Pediatrics*, 131(3). doi: 10.1542/peds.2012-3931(2013)

Support: Binghamton University Psychology Department (MD) and Binghamton University Undergraduate Research Award and Travel Award (MM).