

Adverse Childhood Environments and Salivary Habituation to Food Stimuli



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Introduction

Background

- Childhood environments characterized by low socioeconomic status (SES) and exposure to high levels of unpredictability reliably predict unhealthy eating and greater risk of obesity (Maner, et al., 2017).
- Higher levels of environmental unpredictability and lower childhood SES predict less mindful eating and more eating in the absence of hunger (Hill, et al., 2016) through its impact on body awareness (Proffitt Leyva & Hill, 2018).
- Slower salivary habituation (i.e., decreasing salivation over time) to new foods has been displayed in obese individuals (Epstein, et al., 2008; Epstein, et al.).

Objectives & Hypothesis

- The current research aimed to explore whether childhood environment leads to EAH due to changes in salivary habituation.
- We hypothesize that individuals from low SES and highly unpredictable childhood environments would exhibit less salivary habituation to food stimuli.

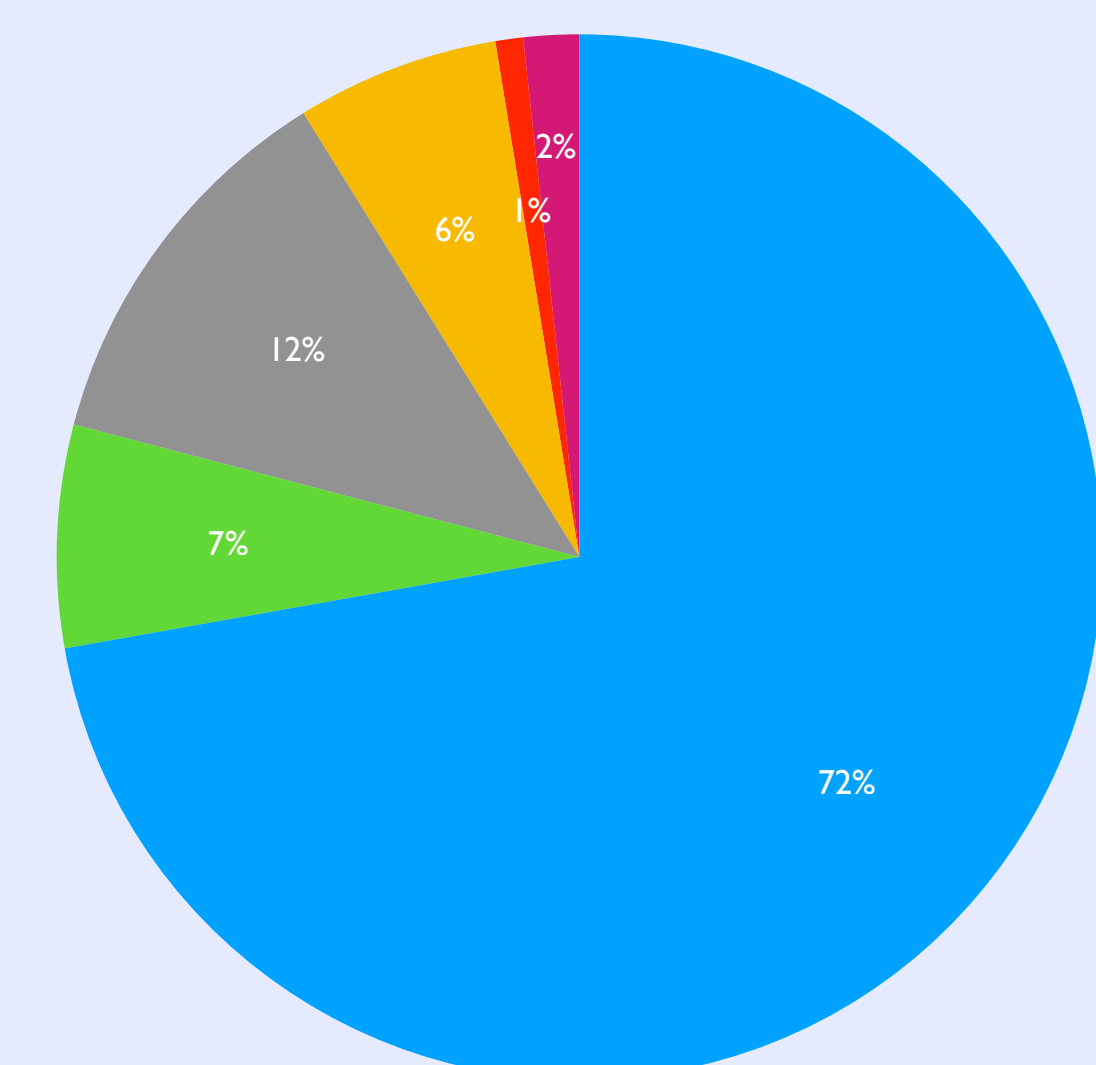
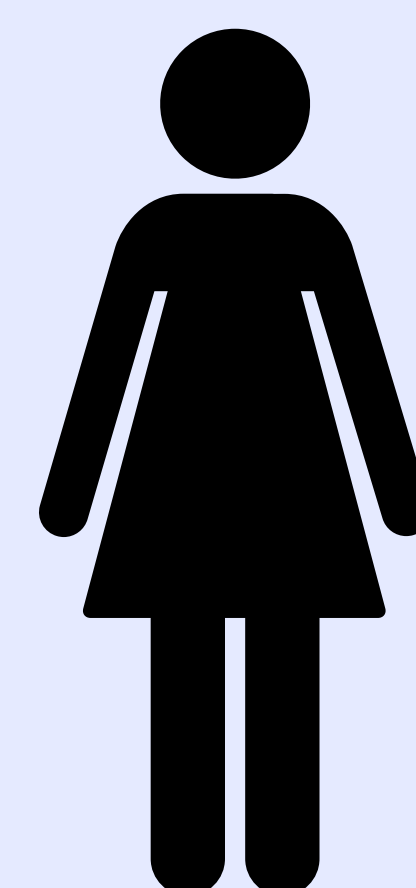
Methods

Participants

116 female undergraduate students

(Male participants not included due to insufficient sample size)

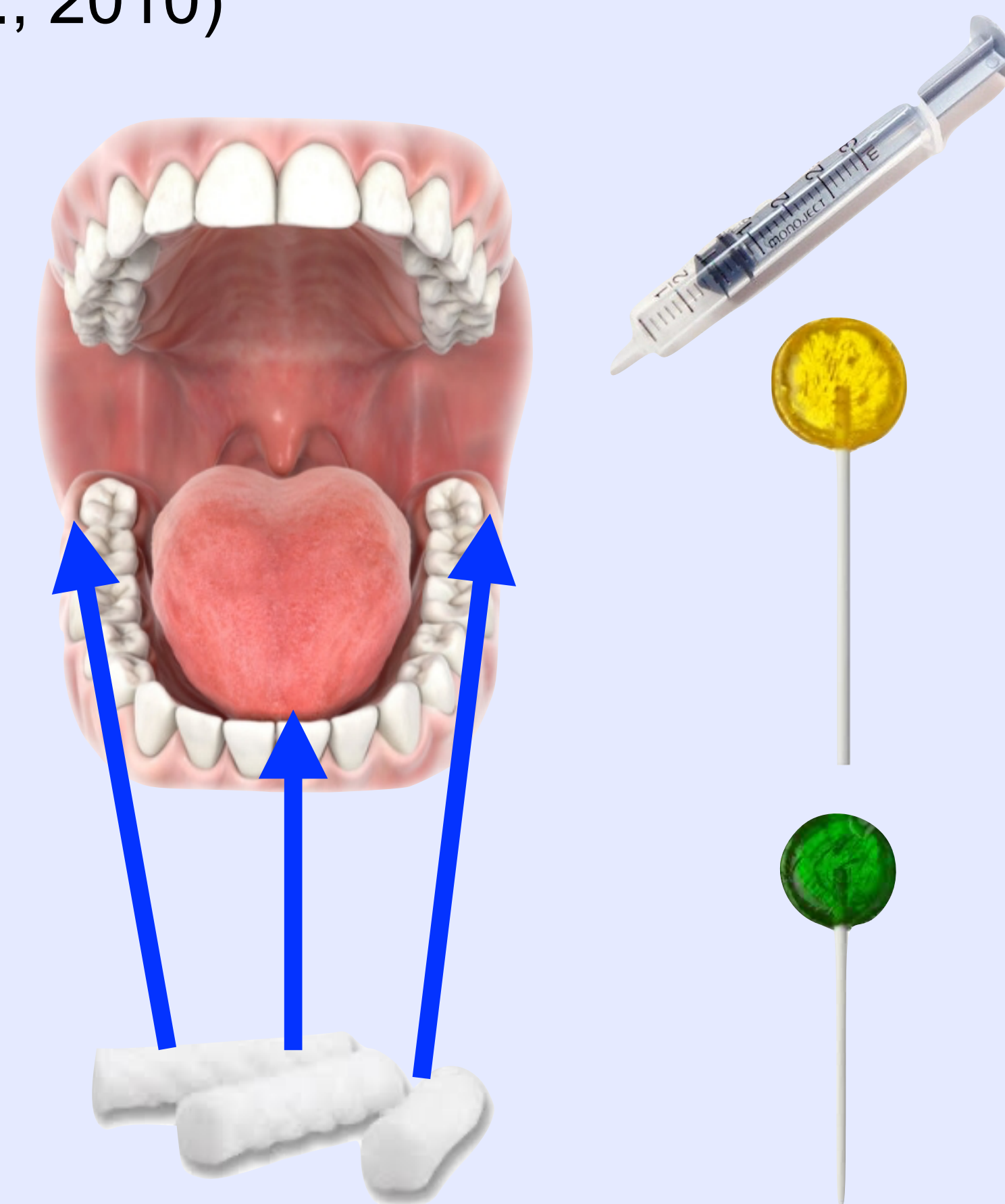
(Mean age = 19.86, SD = 2.51)



- White/Caucasian
- Black/African American
- Hispanic/Latino
- Asian
- Middle Eastern
- Multiracial

Procedure

1. Blood glucose measurement via finger prick
2. Saliva collection: Strongin-Hinsie-Peck Technique (SHP; Bond et al., 2010)



Trials 1-2: 0.5 ml water (baseline stimulus) poured onto tongue

Trials 3-12: lemon lollipop (habituation stimulus) placed on base of tongue
1 min duration per trial

Trials 13-14: green apple lollipop (novel stimulus)

3. Dental gauze rolls weighed pre - and post - SHP

“**Measurement**” (T1-T6) (T6 = novel): Average weight of every 2 trials, subtracted from baseline

Salivary habituation value = (habituation measurement T5) - (habituation measurement T1)

4. Battery of questionnaires assessing Childhood Unpredictability and Childhood SES

Example Items

Please indicate your agreement with each statement based on your early childhood (ages 0-12).
[on a 7 Point Likert Scale]

Childhood SES “I grew up in a relatively wealthy neighborhood.”

Childhood Unpredictability “Things were often chaotic in my house.”

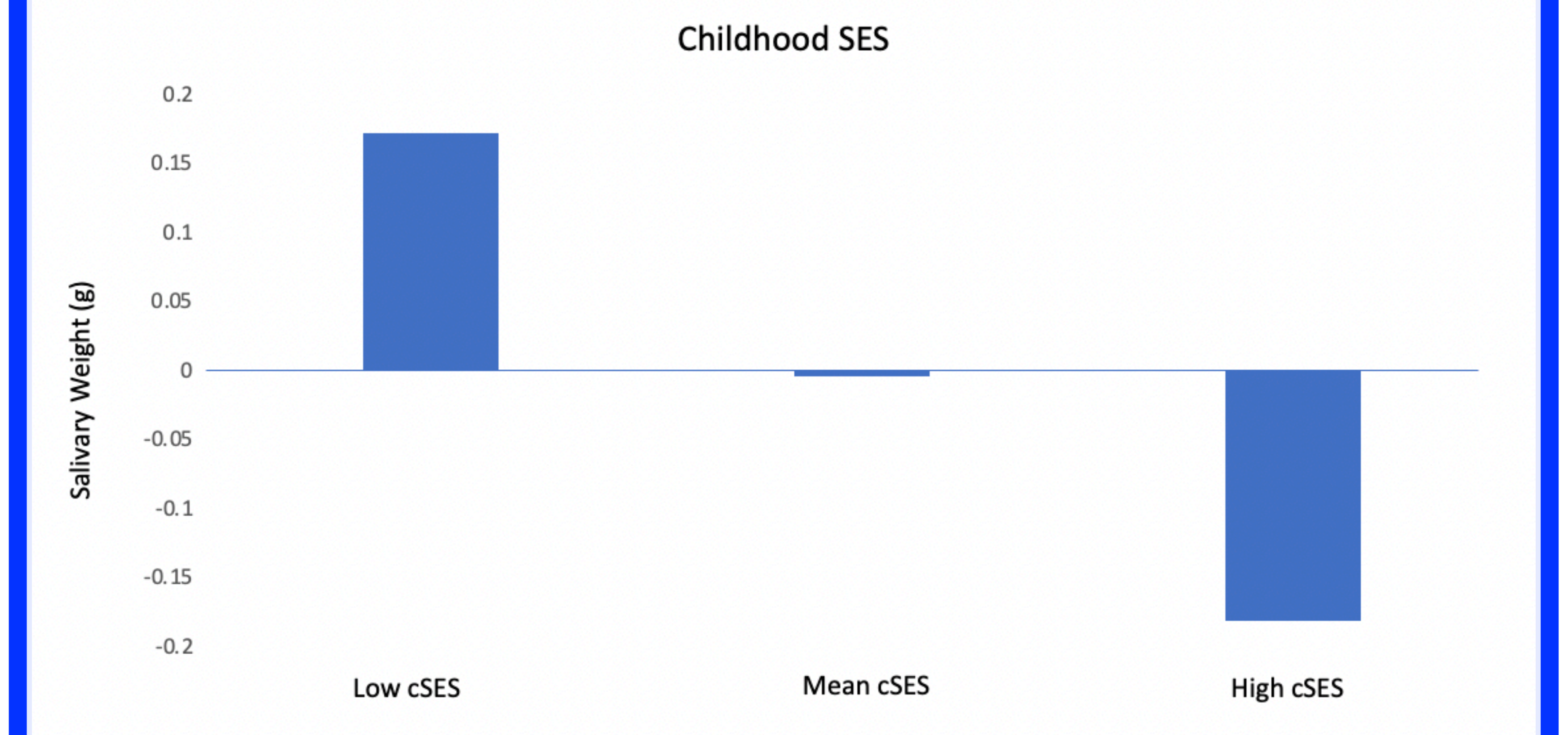
References

- Bond, D. S., Raynor, H. A., McCaffery, J. M., & Wing, R. R. (2010). Salivary habituation to food stimuli in successful weight loss maintainers, obese and normal-weight adults. *International Journal of Obesity*, 34(3), 593-596.
- Epstein, L. H., Robinson, J. L., Temple, J. L., Roemmich, J. N., Marusewski, A., & Nadbrzuch, R. (2008). Sensitization and habituation of motivated behavior in overweight and non-overweight children. *Learning and motivation*, 39(3), 243-255.
- Epstein, L. H., Temple, J. L., Roemmich, J. N., & Bouton, M. E. (2009). Habituation as a determinant of human food intake. *Psychological review*, 116(2), 364.
- Hill, S. E., Proffitt, M. L., Dell'Pore, D. J., Griskevicius, V., & Kramer, A. (2016). Low childhood socioeconomic status promotes eating in the absence of energy need. *Psychological Science*, 27(3), 354-364.
- Maner, J. K., Dittmann, A., Meltzer, A. L., & McNulty, J. K. (2017). Implications of life-history strategies for obesity. *Proceedings of the National Academy of Sciences*, 114(32), 8517-8522.
- Proffitt Leyva, R. P., & Hill, S. E. (2018). Unpredictability, body awareness, and eating in the absence of hunger: A cognitive schemas approach. *Health psychology*, 37(7), 691.

Results

Using Multiple Regression and the Backward Method

- **Model 1:** salivary habituation marginally predicted by childhood SES, $b = -.116$ ($SE = .07$), $p = .093$, but not significantly predicted by childhood unpredictability, $b = .088$ ($SE = .07$), $p = .221$
- **Model 2:** salivary habituation significantly predicted by childhood SES, $b = -.138$ ($SE = .07$), $p = .039$



Overall: higher childhood SES predicts greater salivary habituation

Discussion

Summary and Implications

- These results suggest that women who grow up in resource scarce environments habituate to food stimuli slower than those that grow up in resource abundant environments, which could put these women at risk for greater eating in the absence of hunger, and ultimately obesity.
- These findings could be used to better inform interventions that aim to help individuals maintain healthy lives.

Limitations

- Insufficient sample size for comparing women and men's salivary habituation

Future Directions

- Replicate these results for women, and compare them to men
- Examine whether slower habituation rates for women from low SES childhoods predicts their eating in the absence of hunger