

Introduction

- Diet regulation is one of the prime markers of health behavior and overall well-being
- Past literature discovered a strong association between high sugar intake and low cognitive abilities in aging adults (Ye et al., 2011)
- Previously, rats that ingested high sugar water found to experience greater oxidative stress than control group (Beilharz, Maniam, & Morris, 2014)
- In the past, adhering to a high fat diet resulted in slower learning abilities in the aging adults (Attuquayefio et al., 2016)

Hypothesis

- Old rats on a nutritionally balanced standard diet would perform better on cognitive learning tasks than rats on either a high-sucrose or high-fat diets
- There would be a difference in learning abilities between high-sucrose and high-fat diet groups

Methods

- Subjects:** 15-month-old male Sprague-Dawley rats
- Standard diet (4% sucrose, 1.5% saturated fat)
 - High-sucrose (35% sucrose)
 - High-fat (37% saturated fat)



Procedure: T-maze (Salamone et al., 1994; Bardgett et al., 2009)

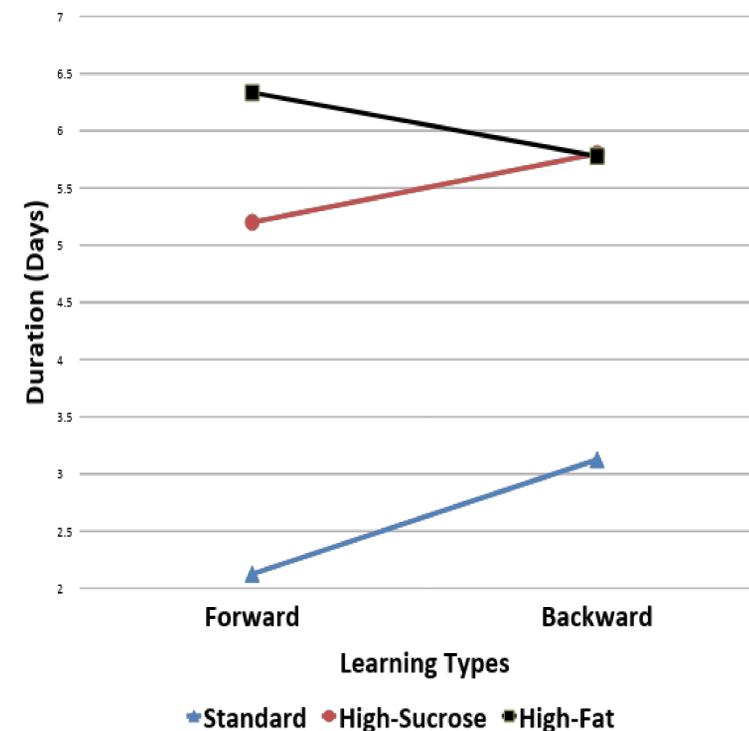
- Diets ad-libitum for 21 days
- Limited amount of food starting testing day
- **Habituation:** In groups of two for ten minutes
- **Learning:** Randomly assigned to baited arm
 - First, un-baited arm is blocked
 - Next, the baited arm is blocked
- **Discrimination I:** Access to both arms
 - Removed after consuming the reward or reaching the end of the non-baited arm (10 trials per day until >90% correct)

Methods Continued...

- **Discrimination I:** Access to both arms
 - Removed after consuming the reward or reaching the end of the non-baited arm (10 trials per day until >90% correct)
- **Discrimination II:** Discrimination after baited and unbaited arms switched

Results

Learning Types vs. Duration



- Rats on nutritionally balanced standard diet (M=2.625) learned significantly faster than the rats on the high-sucrose (M=5.50) and high-fat diet (M=6.056)
- No significant difference in learning abilities between specialized diets or types of learning

Conclusion

- Hypothesis that the rats on nutritionally balanced diet would show a greater learning capacity than experimental groups **supported**
- Hypothesis that there would be a difference in learning abilities between high-sucrose and high-fat diets **not supported**
- Neural rewiring, cell atrophy, or network alteration due to different diets possible (Attuquayefio et al., 2016)
- High-fat diets could lead to atherosclerosis (Beilharz, Maniam, & Morris, 2014).
- Recommend larger sample size and better external factors control in the future

References

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