



Short- and long-term effects of dietary manipulations on impulsive choice behavior and motivation in rats

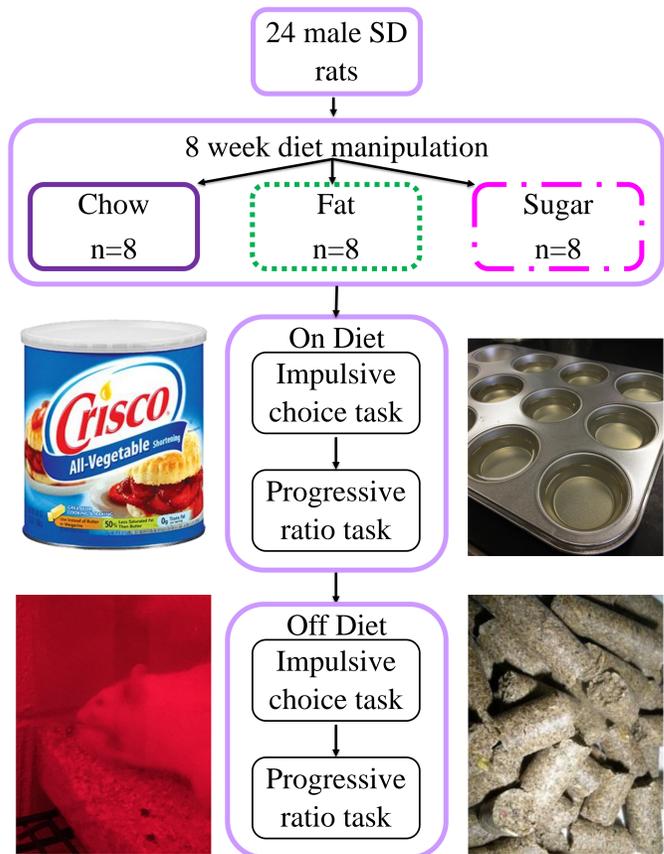


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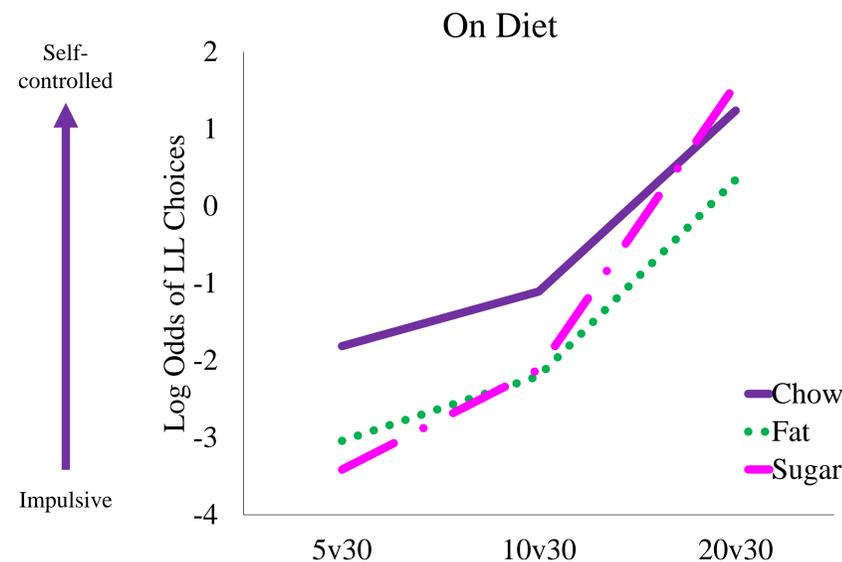
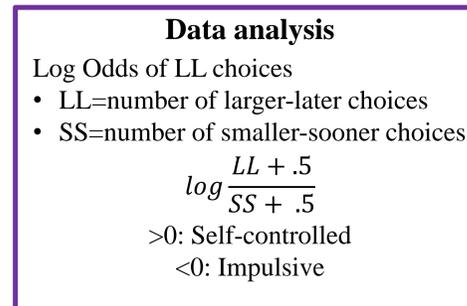
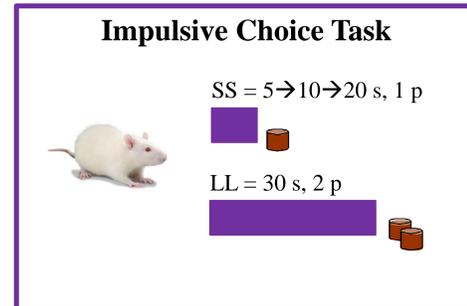
Introduction

- Impulsive choice underlies maladaptive behaviors such as gambling, substance abuse, and obesity
- People with higher percent body fat make more impulsive decisions¹
- The correlation between obesity and impulsive choice could be due to: (1) trait impulsivity as the cause of obesity; (2) obesity as the cause of trait impulsivity; or (3) another related factor, such as diet, causing both
- A previous study showed that rats on a high-fat diet were *less* impulsive than rats on a normal chow diet²
 - Energy budget was not controlled
 - Used an adjusting procedure, which can result in random behavior³
 - Impulsive choice task occurred while the rats were off their diet
- Current study: determine the effects of a high-fat and high-sugar diet on impulsive choice and motivation while on and off high-fat and high-sugar diets

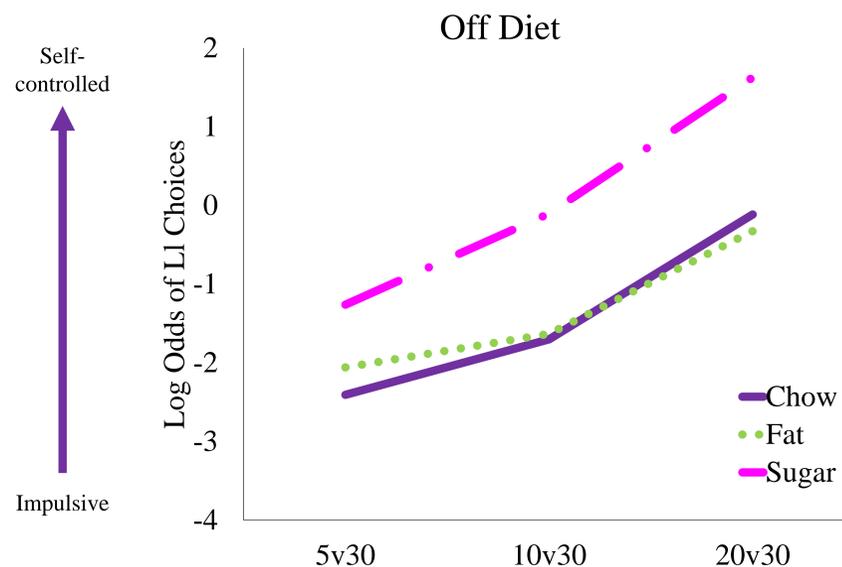
Methods



Choice

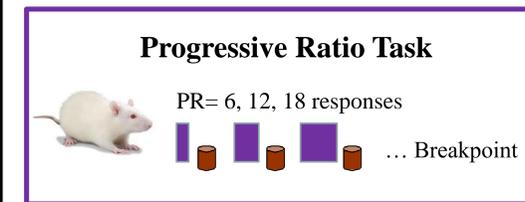


As SS delay increased, all groups made fewer impulsive choices. High-fat and high-sugar diets led to more impulsive choices when the SS delay was 5 and 10 s.

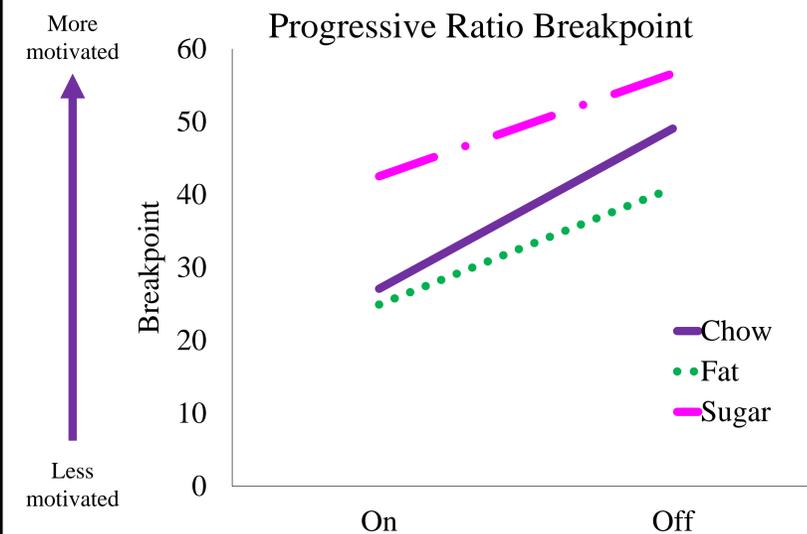


As SS delay increased, rats in all groups made fewer impulsive choices. High-sugar diet led to more self-controlled choices for all delays.

Motivation

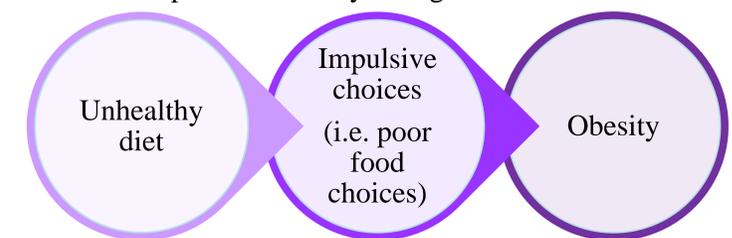


All groups were more motivated to work for food when off the diet. Rats on the high-sugar diet were more motivated to work for food overall.



Discussion

- High-fat and high-sugar diets lead to more impulsive choices while on the unhealthy diet
- Behavioral patterns change when taken off the unhealthy diet, such that the high-sugar diet resulted in more self-controlled choices
- Diet may be the root cause of the relationship between impulsivity and obesity, suggesting a strong need for early behavioral interventions to promote healthy eating



References

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2. Narayanaswami, V., Thompson, A. C., Cassis, L. A., Bardo, M. T., & Dwoskin, L. P. (2013). Diet-induced obesity: dopamine transporter function, impulsivity and motivation. *Int J Obes (Lond)*, 37(8), 1095-1103.
3. Peterson, J. R., Hill, C. C., & Kirkpatrick, K. (2015). Measurement of impulsive choice in rats: Same- and alternate-form test-retest reliability and temporal tracking. *Journal of the Experimental Analysis of Behavior*, 103(1), 166-179.

Acknowledgements

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