The Effect of Diet on Individual Differences in Impulsive Choice

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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 decisions
- 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; (3) another related factor, such as diet, causing both
- People who eat diets high in fat and sugar are more impulsive
- Rat models can help determine the direction of this relationship
- A previous study showed that rats on a high-fat diet were less impulsive than rats on a normal chow diet, contrary to what would be expected
- Current study: determine the effect of high-fat and high-sugar diets on impulsive choice and how individual differences in impulsive choice were influenced by diet

Methods

- 24 male SD rats
- 8 week diet manipulation
- Chow (n=8)
- Fat (n=8)
- Sugar (n=8)

On Diet

Impulsive choice task

Off Diet

Impulsive choice task

Data analysis

Log Odds of LL choices
- LL = number of larger-later choices
- SS = number of smaller-sooner choices

\[ \log \left( \frac{LL}{SS} + \frac{1}{2} \right) \]

Self-controlled

Impulsive

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.

Log Odds of LL Choices (On)

Log Odds of LL Choices (Off)

Discussion

- High-fat and high-sugar diets led to more impulsive choices
- Diet affected the overall level of impulsive choice, but not the individual differences in impulsive choice
- Diet influenced impulsive choice and could play a key role in the relationship between impulsive choice and obesity, suggesting a strong need for early behavioral interventions to promote healthy eating

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References