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Effects of Restrained Eating on Episodic Memory and Implications for Homeostatic Appetite Regulation

Morgan Kindel

Chapman University, kinde108@mail.chapman.edu

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Abstract

Recent studies in the fields of Psychology and Neuroscience suggest a relationship between episodic memory and appetite regulation. A majority of these studies have used BMI as an important variable in this relationship, and have found mild episodic memory deficits to be more likely in individuals with higher BMI's. The goal of this research was to determine whether restrained disordered eating, regardless of BMI, influenced episodic memory and appetite regulation. Initially, we predicted that individuals showing dietary restraint would show signs of a stronger episodic memory, and therefore would have weaker hunger cues and stronger satiety cues. However, we found that restrained eaters had a significantly worse episodic memory than the control group. Our findings indicate that there may be other cognitive, behavioral, or physiological factors that are capable of influencing episodic memory deficits besides BMI.

Background

- Episodic memory is a type of long-term memory that allows us to mentally revisit our past experiences.
- Research suggests that episodic memory may play a role in homeostatic appetite regulation by providing memory cues for when to eat (Brunstrom, Burn, Sell, Collingwood, Rogers, & Wilkinson, 2012)
- Several studies have shown that deficits in episodic memory are associated with obesity and weight gain (Davidson, Kanoski, Schier, Clegg, & Benoit, 2007).
- Restrained eaters are individuals who intentionally restrict their dietary intake in order to control their weight.

Research Questions

- What does the relationship between episodic memory and homeostatic appetite regulation look like in restrained eaters?
- Are food objects (in comparison to non-food objects) able to be more easily recognized by restrained eaters than by non-restrained eaters?
- Are there other factors besides a high Body Mass Index (BMI) that contribute to episodic memory deficits found in previous research?

Methods

Participants: N=94

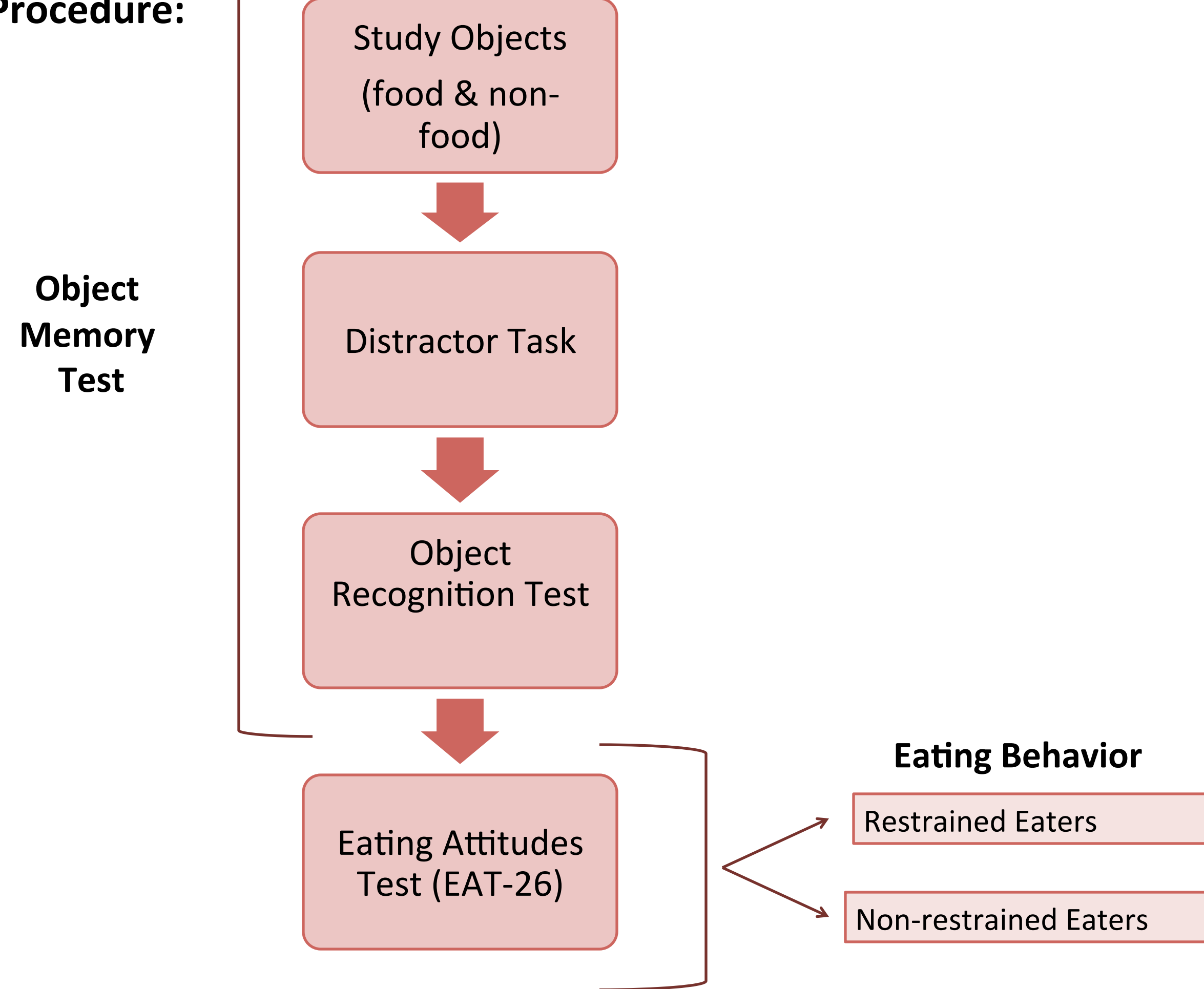
Design: 2x2 Factorial

Object Type

	Food Objects	Non-Food Objects
Restrained Eaters <i>n</i> =36	Restrained eaters, Food objects	Restrained eaters, Non-food objects
Non-restrained Eaters (Control) <i>n</i> =58	Non-restrained eaters, Food objects	Non-restrained eaters Non-food objects

Methods (continued)

Procedure:



Results

- A factorial ANCOVA was used to analyze results in SPSS
- There was a main effect of restrained eating on memory performance, in that restrained eaters had a significantly worse memory performance than the control group ($F(1,90)=13.076, p<0.0001$).
- Object type and eating status significantly interacted to affect episodic memory performance ($F(1,90)=6.794, p=0.011$): among restrained eaters, memory was similar for food and non-food objects, however for the control group, memory was better for food objects than non-food objects.

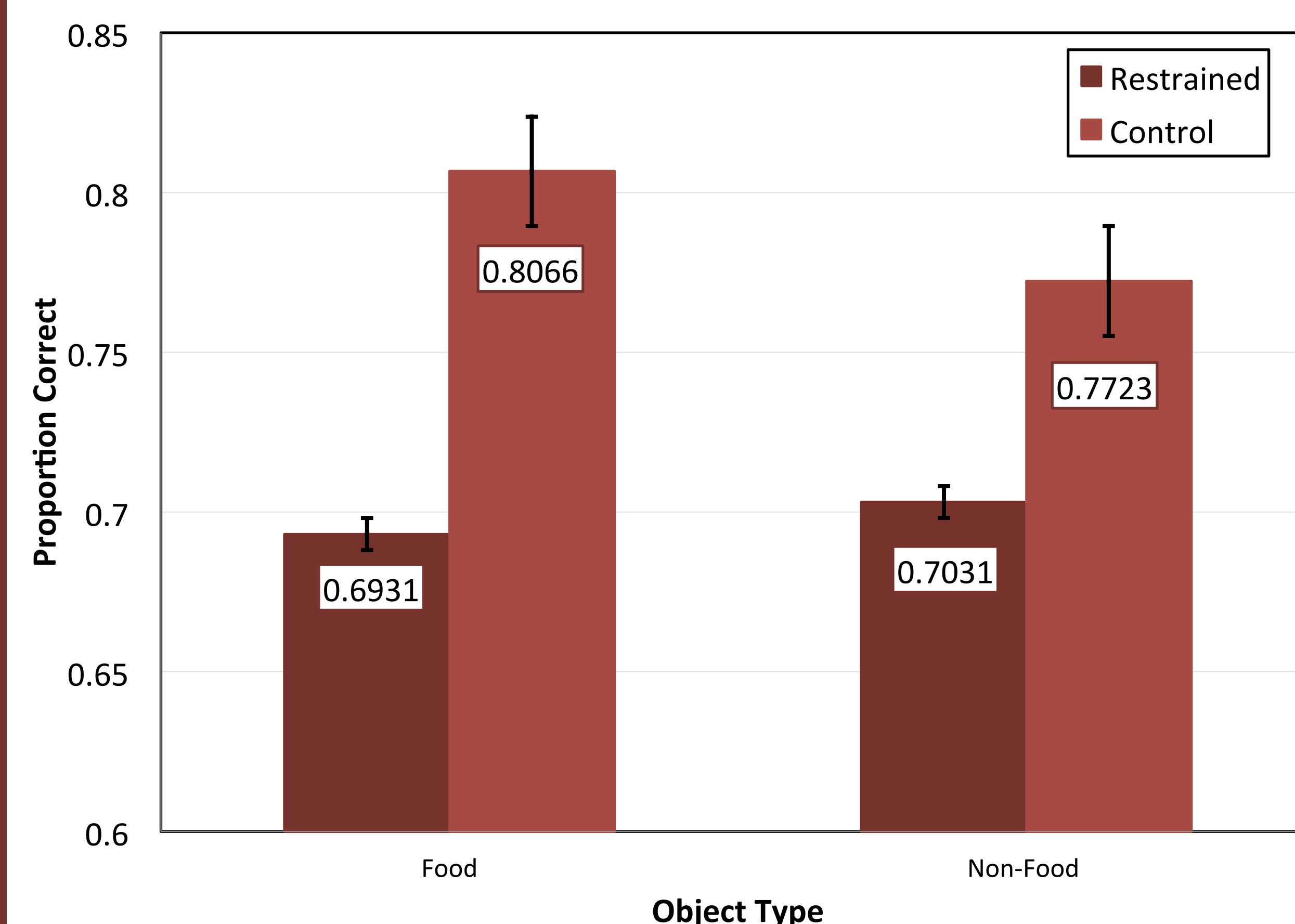


Figure 1: The effects of object type (food vs. non-food) on mean memory score in an object recognition test in restrained and non-restrained (control) eaters.

Conclusion

- The main effect on eating assessment group (restrained vs. control) suggests that there are underlying physiological, cognitive or behavioral differences in restrained eaters, which may, either directly or indirectly, impact episodic memory.
- There are many shared qualities, both physical and cognitive, between the low and high BMI restrained eaters.
- There is reason to believe that some of these similarities, which are absent in the control group, are contributing to a weaker episodic memory.
- Episodic memory deficits have been linked to damage in the hippocampus, an area in the brain essential for memory processing and long term potentiation (Harvey, Solovyova, & Irving, 2006).
- One similarity worth noting among restrained eaters are low leptin levels:
 - Regardless of BMI, restrained eaters have been shown to have low levels of leptin (Laessle, Tuschle, Kotthaus, & Pirke, 1989), due to lack of adequate daily caloric intake (relative to current needs, energy expenditure, and genetic weight set-point).
 - Referred to as a "hunger hormone", leptin is known for being responsible for regulating dietary intake and bodyweight.
 - It is possible that the leptin receptors in the hippocampus are responsible for both appetite regulation and episodic memory. This has been exemplified in several studies, including one conducted by Harvey et al. (2006), which found that mice who were given direct doses of leptin significantly improved on long term memory-based tasks.

Acknowledgments

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References

- Brunstrom, J., Burn, J., Sell, N., Collingwood, J., Rogers, P., & Wilkinson, L. (2012). Episodic memory and appetite regulation in humans. *Plos ONE*, 7(12), e50707.
- Davidson, T., Kanoski, S., Schier, L., Clegg, D., & Benoit, S. (2007). A potential role for the hippocampus in energy intake and body weight regulation. *Current Opinion In Pharmacology*, 7(6), 613-616.
- Garner, D.M., Olmsted, M.P., Bohr, Y., and Garfinkel, P.E. (1982). The Eating Attitudes Test: Psychometric features and clinical correlates. *Psychological Medicine*, 12, 871-878.
- Harvey, J., Solovyova, N., & Irving, A. (2006). Leptin and its role in hippocampal synaptic plasticity. *Progress in Lipid Research*, 45(5), 369-378.
- Laessle, R., Tuschl, R., Kotthaus, B., & Pirke, K. (1989). Behavioral and biological correlates of dietary restraint in normal life. *Appetite*, 12(2), 83-94.