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## Introduction

The Power of Food Scale (PFS) is a self-administered measure of the drive to consume food in an obesogenic food environment. Here we performed brain network analyses in order to determine whether brain functional connectivity changes as a result of food craving and how this may be moderated by scores on the PFS. Because liquid meal replacements have been shown to satiate short-term hunger, we choose to image participants both with and without Boost® on board following food restriction.

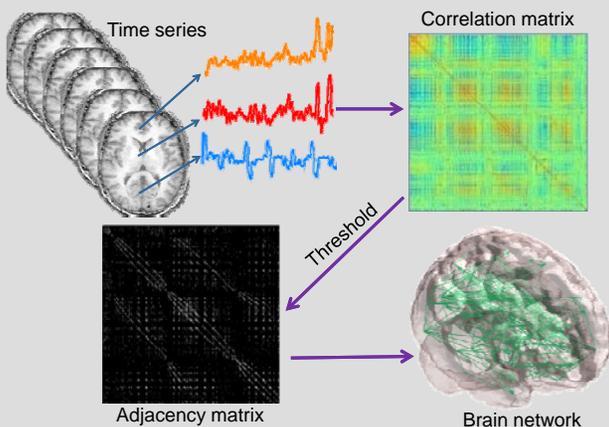
## Methods

- 19 older adults (age  $64.65 \pm 6.84$  years), divided by median split of PFS score
- “Low PFS” =  $1.89 \pm 0.52$ , n=9; “High PFS” =  $3.63 \pm 0.61$ , n=10

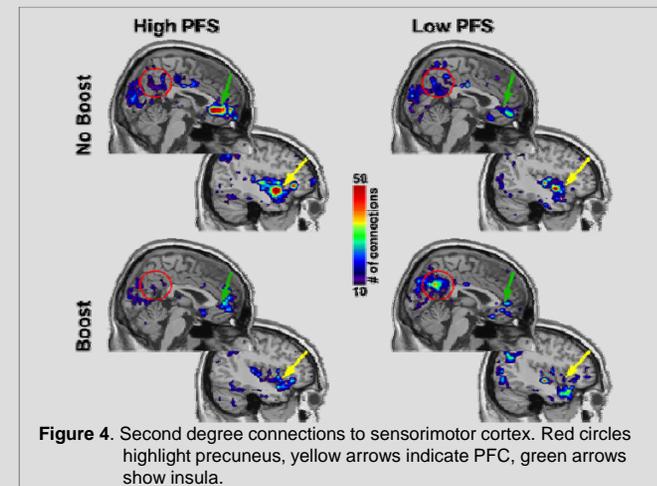
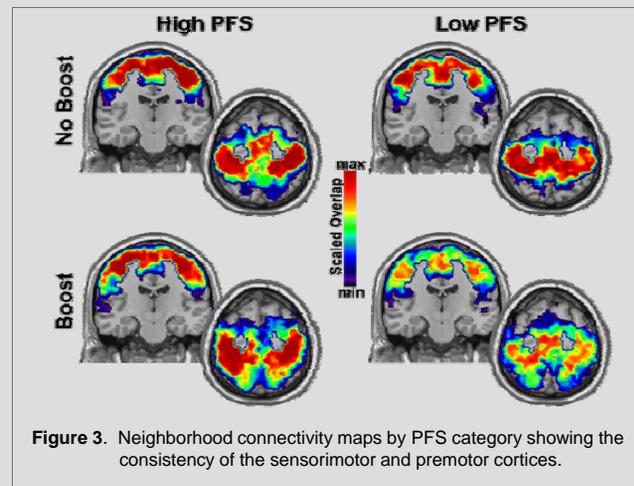
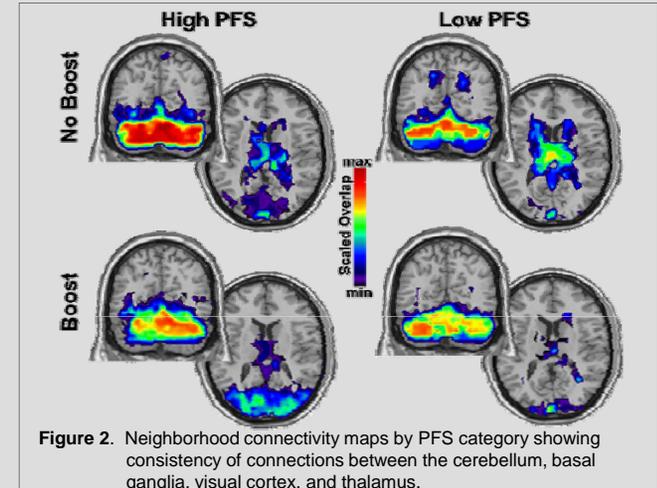
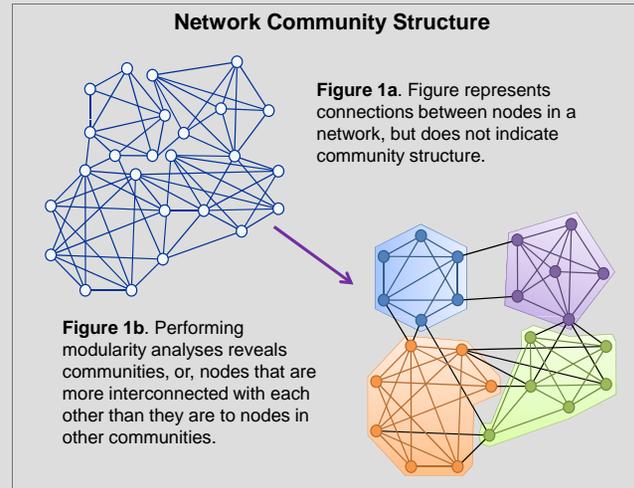
On scan days:

- Participants consumed a prepared, calorically controlled (350 or 450 calorie) breakfast, then completed 2.5 hour fast
- Received Boost® on one of the scan days, randomized for supplement/no supplement scan order
- Scanned on 1.5T GE scanner using an 8-channel head coil (GE Med Systems, Milwaukee, WI)
- During scan, exposed to a food cue manipulation followed by a resting session
- Anatomic imaging (3D BRAVO), and resting fMRI (EPI, TR2000, voxel size 3.75mm x 3.75mm x 5mm)

## Network Generation



## Results



## Conclusions

- In the no Boost® condition, both groups show high interconnectivity between the cerebellum, basal ganglia, and thalamus (figure 2), areas related to craving and motor function. Following Boost®, this relationship remains strong in the high PFS group, but is reorganized in the low PFS group.
- Those with high PFS also show high interconnectivity between the basal ganglia and visual cortex, even following consumption of Boost®, indicating better visualization and, potentially, stronger food seeking behavior.
- The sensorimotor and premotor cortices are highly interconnected regardless of condition (Figure 3). In the low PFS group following Boost®, there is a decrease in the consistency of this neighborhood and reorganization of the network, suggestive of a decrease in the drive to seek food.
- Following Boost® only in the low PFS group, the motor and premotor cortices reestablish connections with the default-mode network (figure 4).
- These data suggest that those with high PFS scores are hypersensitive to food cues that are prominent in obesogenic environments.