



The Impact of Mindfulness Training on Stress Eating: A Longitudinal Neuroimaging Study



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Take-Home Message:

Mindfulness training successfully reduces stress-related overeating behavior which can be observed on both the behavioral and neuronal levels.

Motivation & Main Aim:

- Stress is associated with increased feelings of hunger and food cravings.
- Frequently engaging in stress-eating behavior can lead to weight gain → excessive weight gain can increase the risk of metabolic and cardiovascular diseases.
- Mindfulness training can serve as an **intervention strategy** for stress-eating behaviors through its ability to:
 - Decrease stress
 - Regulate emotions
 - Increase interoceptive awareness (i.e., become more aware of feelings of hunger and satiety)
 - Develop a more mindful relationship with food

Main aims: to investigate whether a food-related mindfulness training course can:

- reduce stress-eating and food cravings
- increase perceived mindfulness
- alter the functional connectivity (i.e., the communication) between brain areas important to both eating behavior and mindfulness training
 - 3b. determine whether behavioral changes are correlated with the functional connectivity alterations

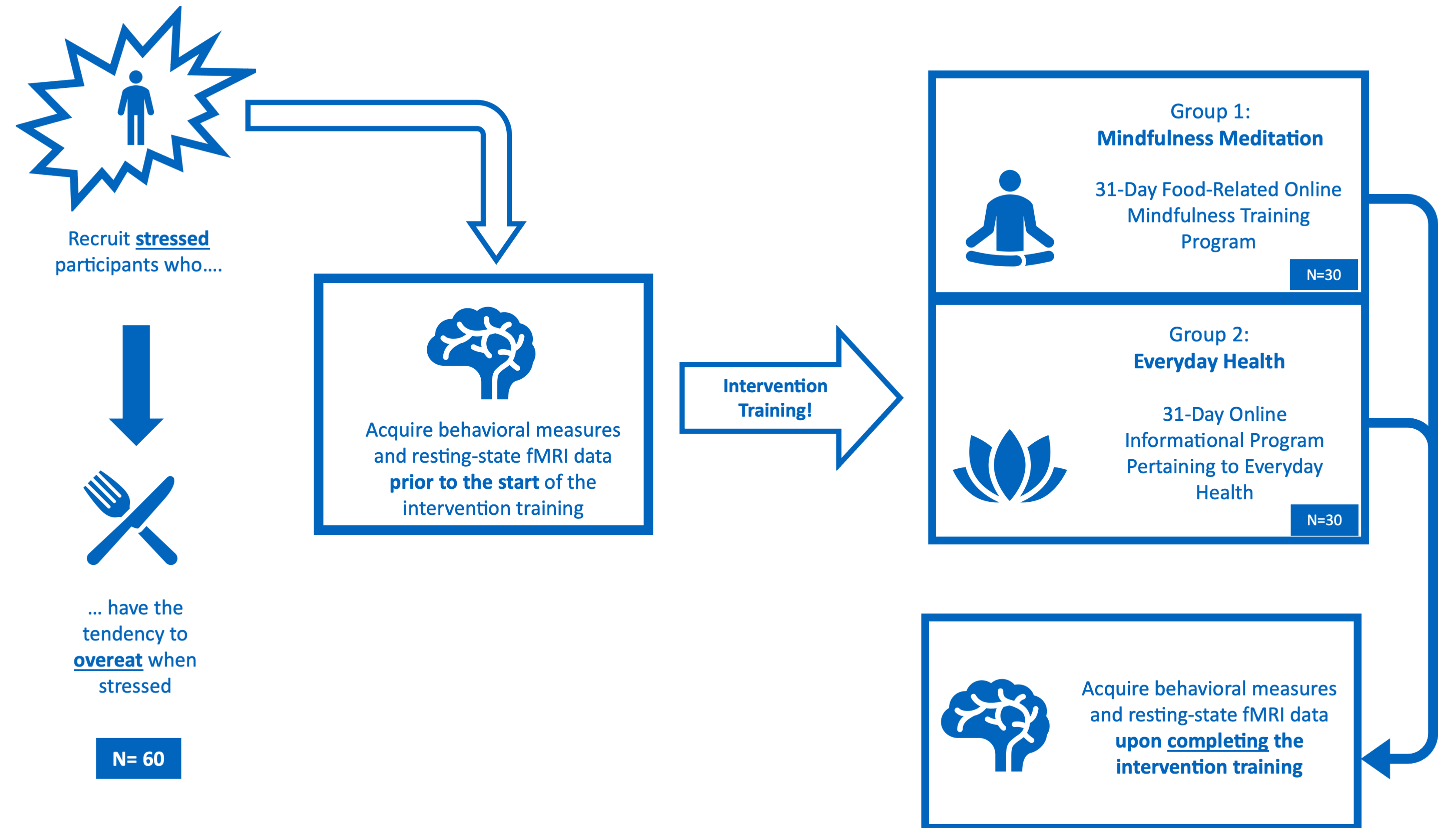
Conclusions:

Participants in the mindfulness training group not only exhibited a **decrease in stress and emotional eating tendencies** but also reported feeling more mindful in their daily life.

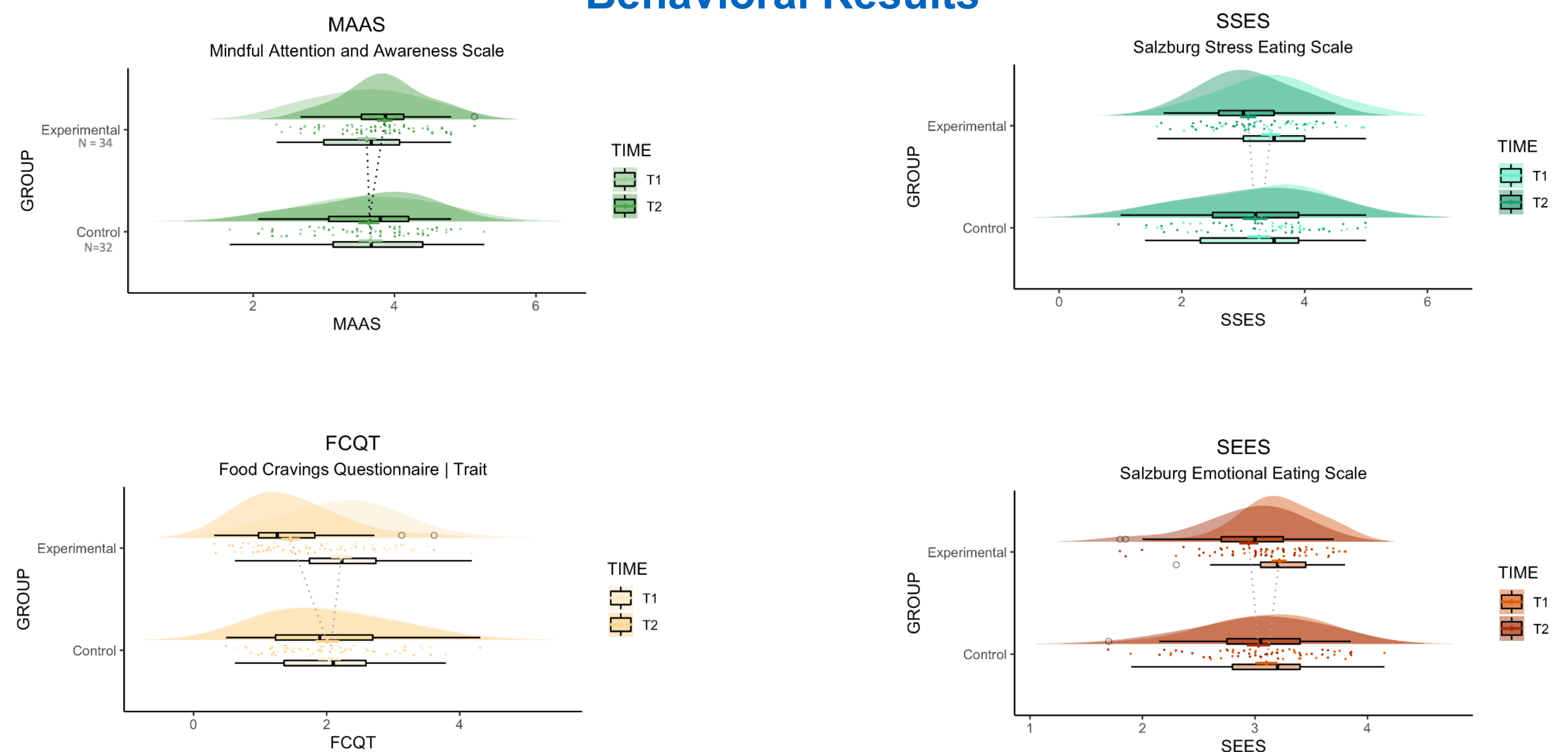
These behavioral changes were reflected in functional connectivity alterations with the:

- Medial and lateral hypothalamus:** brain areas that control feelings of satiety and hunger
- Posterior and anterior insula:** brain areas that play an important role in mindfulness as well as the processing of rewarding stimuli (i.e., food).

These results not only provide the scientific community with further insight into the mechanisms of mindfulness meditation, stress reduction, and eating behavior but could also be considered as a possible therapeutic intervention in patients with cardiovascular or metabolic disease.



Behavioral Results

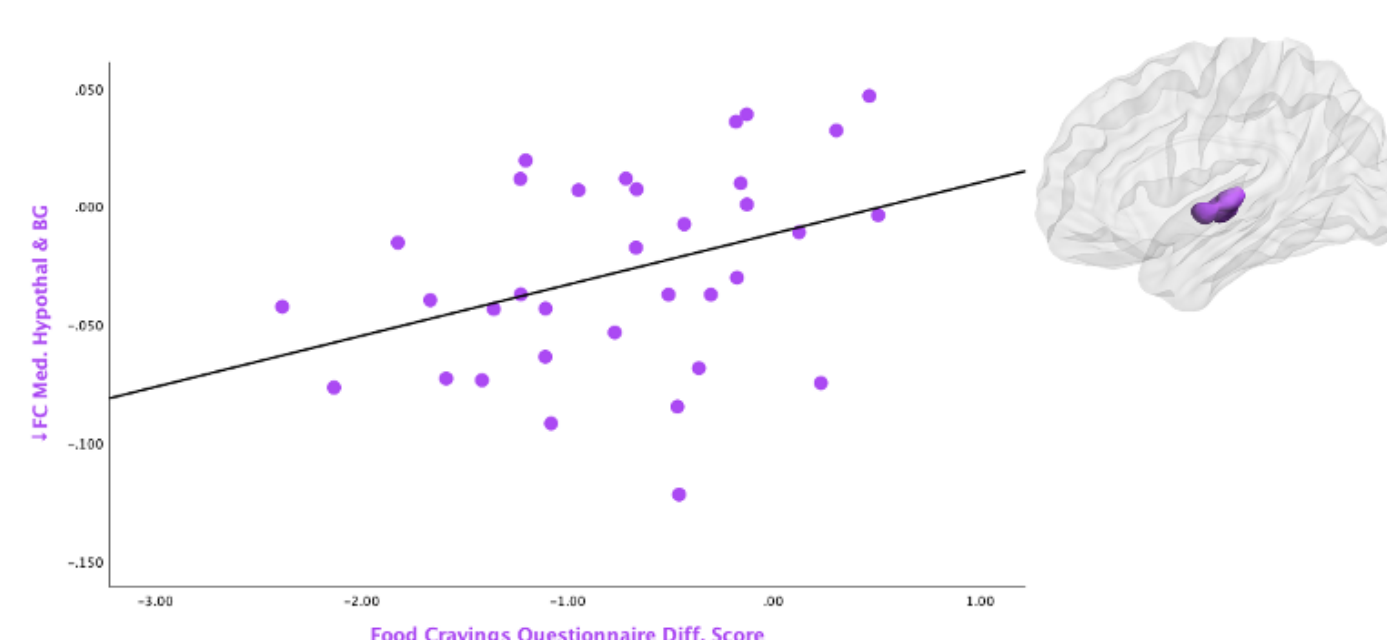


Summary of brain imaging results:

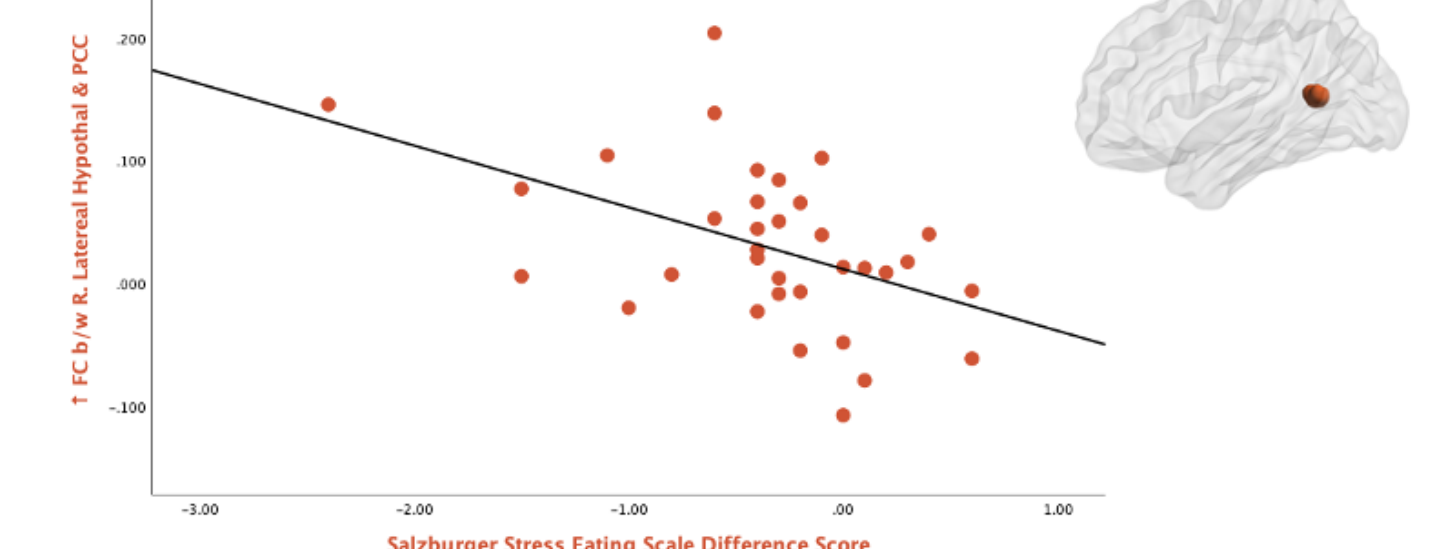
✓ able to observe changes in resting-state FC in the hypothalamus and the insula in participants who underwent mindfulness training

- ↑ FC between the right **Lateral Hypothalamus** & the **Ventral PCC**
- ↓ FC between the left **Lateral Hypothalamus** & the **Left PreSMA**
- ↓ FC between the left **Medial Hypothalamus** & the **Striatum (incl. Putamen)**
- ↑ FC between the left **Medial Hypothalamus** & the **Precuneus & Caudal Precuneus**
- ↑ FC between the left **Medial Hypothalamus** & the **Angular Gyrus**
- ↑ FC between the left **Anterior Insula** & the **Postcentral Gyrus & Occipital gyrus**
- ↑ FC between the left **Posterior Insula** & the **Postcentral Gyrus**
- ↑ FC between the right **Posterior Insula** & the **Inferior Parietal Lobule**

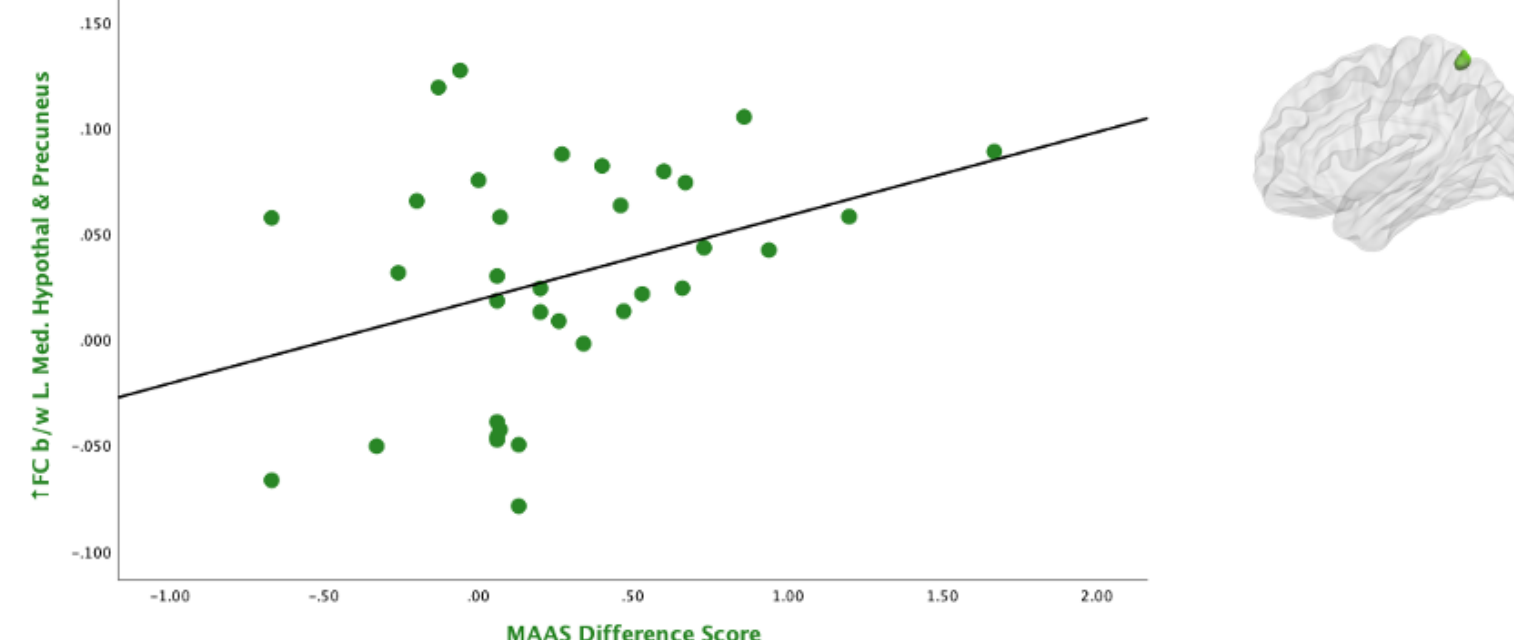
↓ FC between Left Medial Hypothalamus & the Basal Ganglia



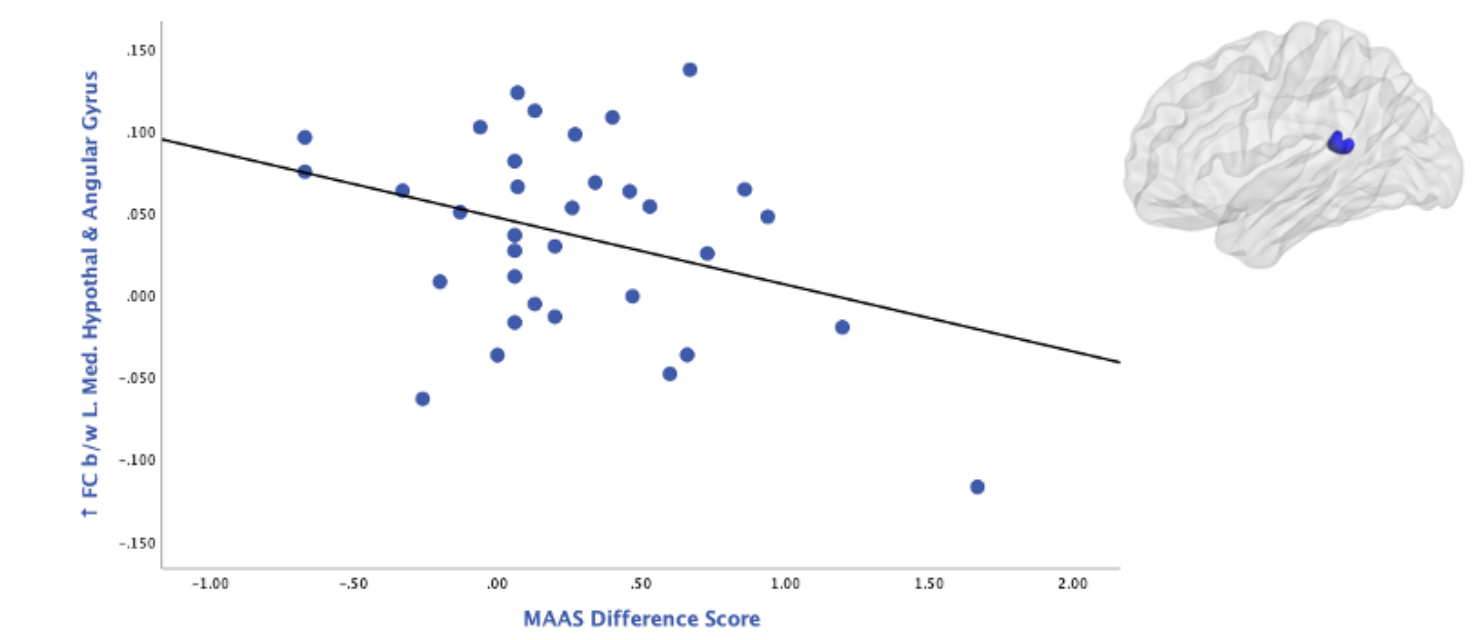
↑ FC between: Right Lateral Hypothalamus & the Ventral PCC



↑ FC between the Left Medial Hypothalamus & the Caudal Precuneus



↑ FC between the Left Medial Hypothalamus & the Angular Gyrus



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