

## INTRODUCTION

- Emotion Regulation is the ability to effectively manage one's emotions by adjusting one's situation, one's attention, one's appraisal of the situation, or one's response toward the situation (Gross, 2015)
- Previous research shows that emotion regulation employs the dorsomedial prefrontal cortex (PFC), dorsolateral PFC, ventrolateral PFC, and posterior parietal cortex (Buhle et al., 2013)
- Spousal bereavement is one of the greatest stressors, which causes psychological, physiological, and neurobiological changes that negatively affect well-being
- Existing psychotherapies to reduce grief and stress are burdensome in terms of cost, duration, and unclear neural mechanisms (Currier et al., 2010, Stroebe et al., 2005)
- Therefore, we examined the efficacy and neural mechanisms of a novel reappraisal training paradigm among bereaved spouses

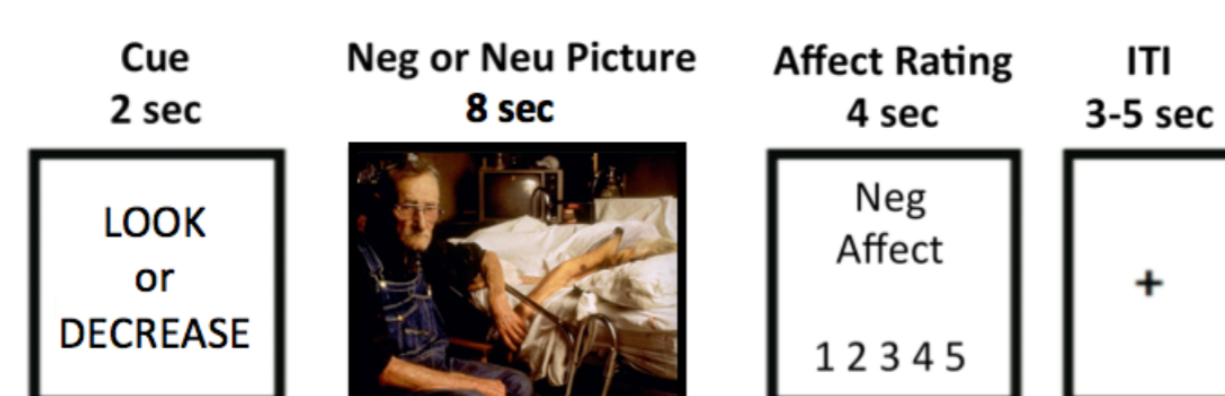
## METHOD

### 1. Participant Recruitment:

- 22 bereaved spouses (11 female;  $M_{age} = 71.1$  years;  $\sigma = 7.45$  years; range = 52.0 – 82.0 years). 1 spouse was an outlier from the mean of RCS change (see below), so this person was excluded on RCS, but included for ICG analysis.

### 2. Procedure

- Center for Epidemiologic Studies Depression Scale (CES-D)** (Radloff, 1977): Participants completed the CES-D, which assesses symptoms of depression. For example, participants rated to what extent their sleep was restless and the extent to which they felt sad.
- Inventory of Complicated Grief (ICG)** (Prigerson et al., 1995): Participants completed the ICG, which assesses indicators of grief. For example, participants rated to what extent they longed for the person who died.
- Training Design:** Participants completed 5 sessions of emotion regulation training every 1-3 days. The strategy was reappraisal. At each training session, participants completed an Emotion Regulation Task.
- Emotion Regulation Task:** Participants viewed negative and neutral images and were instructed to look naturally or employ reappraisal for each. Participants then rated their negative affect on a scale of 1 to 5.



- fMRI:** At Sessions 1 and 5, participants completed this task while undergoing functional magnetic resonance imaging (fMRI) using a 3.0T Siemens Prisma MR scanner at the Core for Advanced Magnetic Resonance Imaging at Baylor College of Medicine.

### 3. Data Analysis

- The reappraisal-related brain mask was obtained from Buhle et al., 2013
- We computed the degree to which participants' brain activity during the emotion regulation task matched the reappraisal-related brain mask producing "Reappraisal Correspondence Scores" (RCS) (see Figure 1)

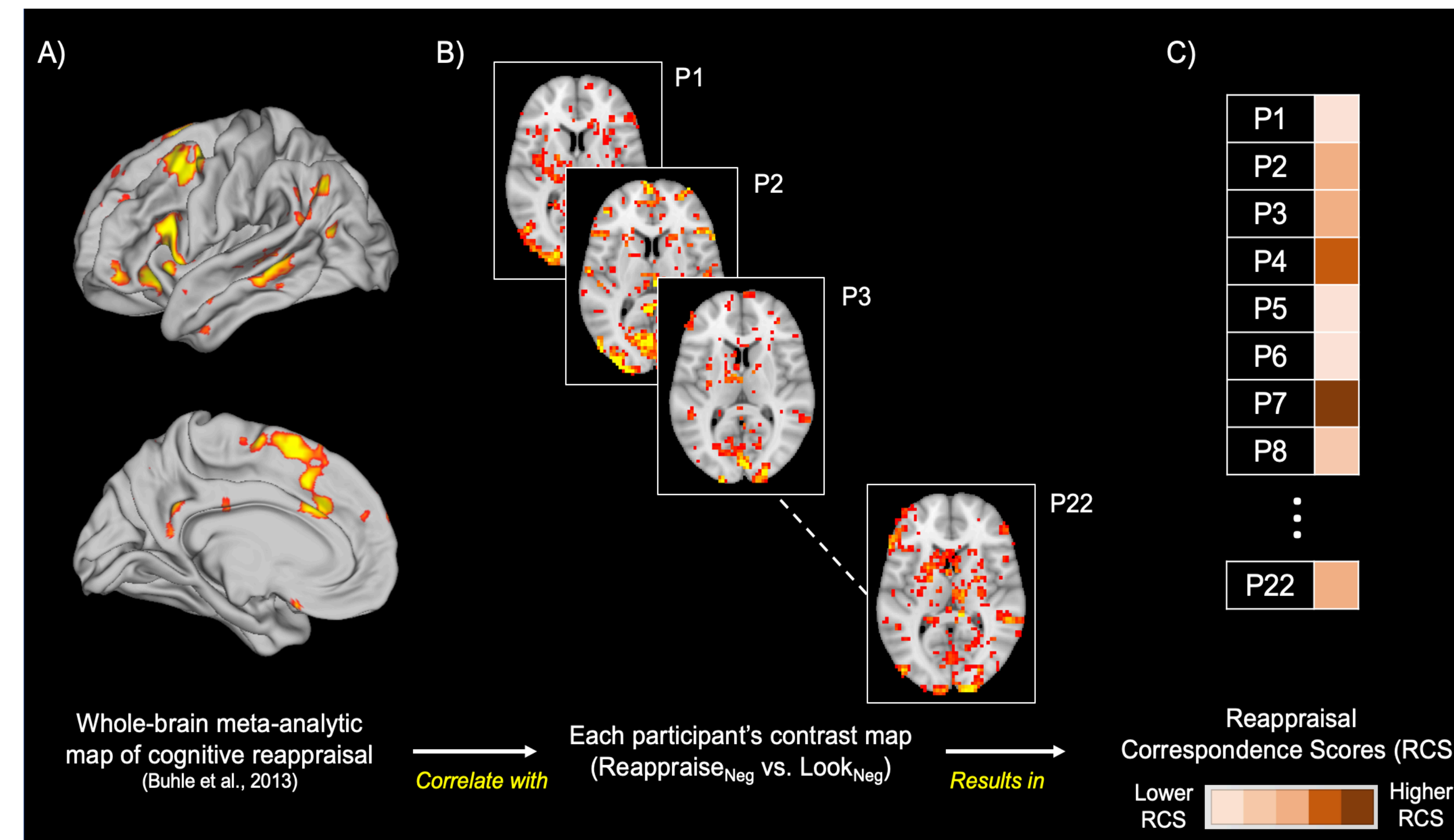


Figure 1: RCS computation for each participant during the emotion regulation task

## RESULTS

### Grief Symptoms from Session 1 to Session 5

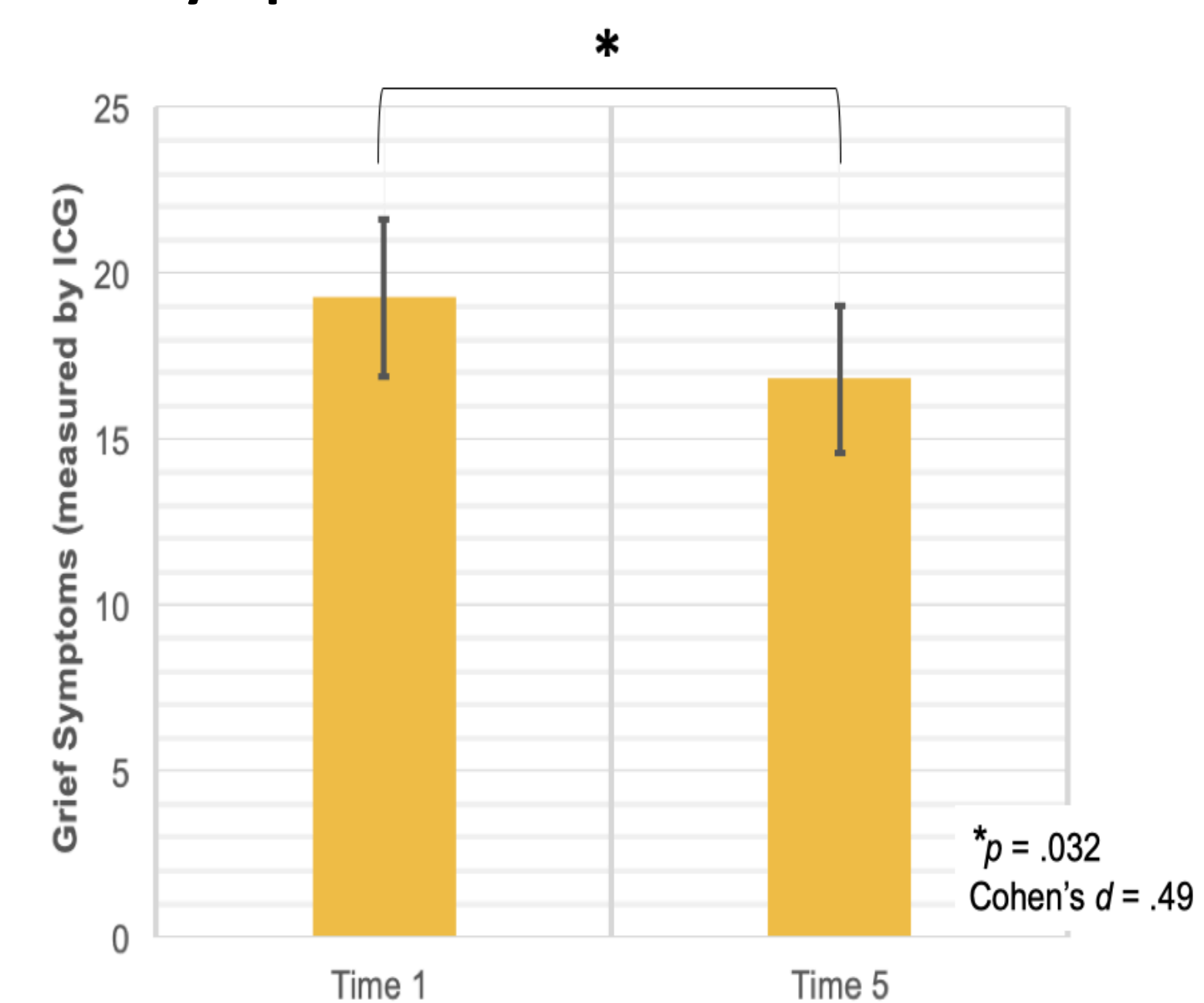


Figure 2: Graph showing the change in Inventory of Complicated Grief (ICG) score from Session 1, assessed approximately 6 months post spousal loss, and at Session 5, after undergoing cognitive reappraisal training. Error bars indicate +/- standard error.

### RCS Change Predicts Depression Symptom Change from Session 1 to Session 5

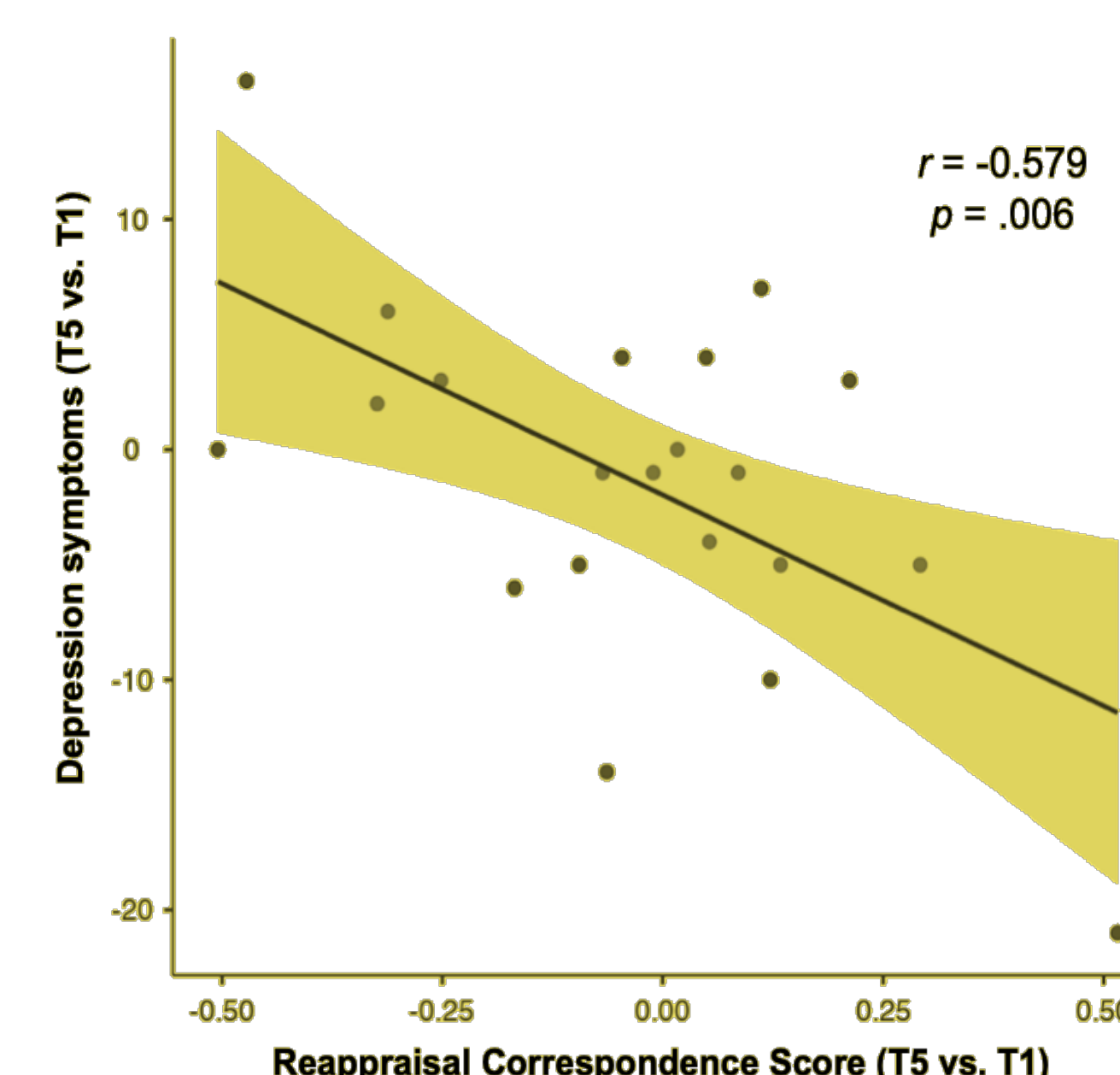


Figure 3: Graph showing a negative correlation between the recruitment of brain regions associated with cognitive reappraisal implementation and the expression of depression symptoms from Session 1 to Session 5.

## CONCLUSIONS

- Preliminary data show a decline in grief symptoms during a 2 week novel cognitive reappraisal training paradigm among bereaved spouses
- As recruitment of the cognitive reappraisal implementation network (Buhle et al., 2013) increases, symptoms of depression decrease
- While preliminary, these data suggest that cognitive reappraisal interventions may reduce grief among bereaved spouses as well as the potential neural mechanisms by which some of these affective shifts may occur

## FUTURE DIRECTIONS

- Future directions include creating increasingly personalized emotion regulation interventions that represent the best fit for a given individual in a given situation

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