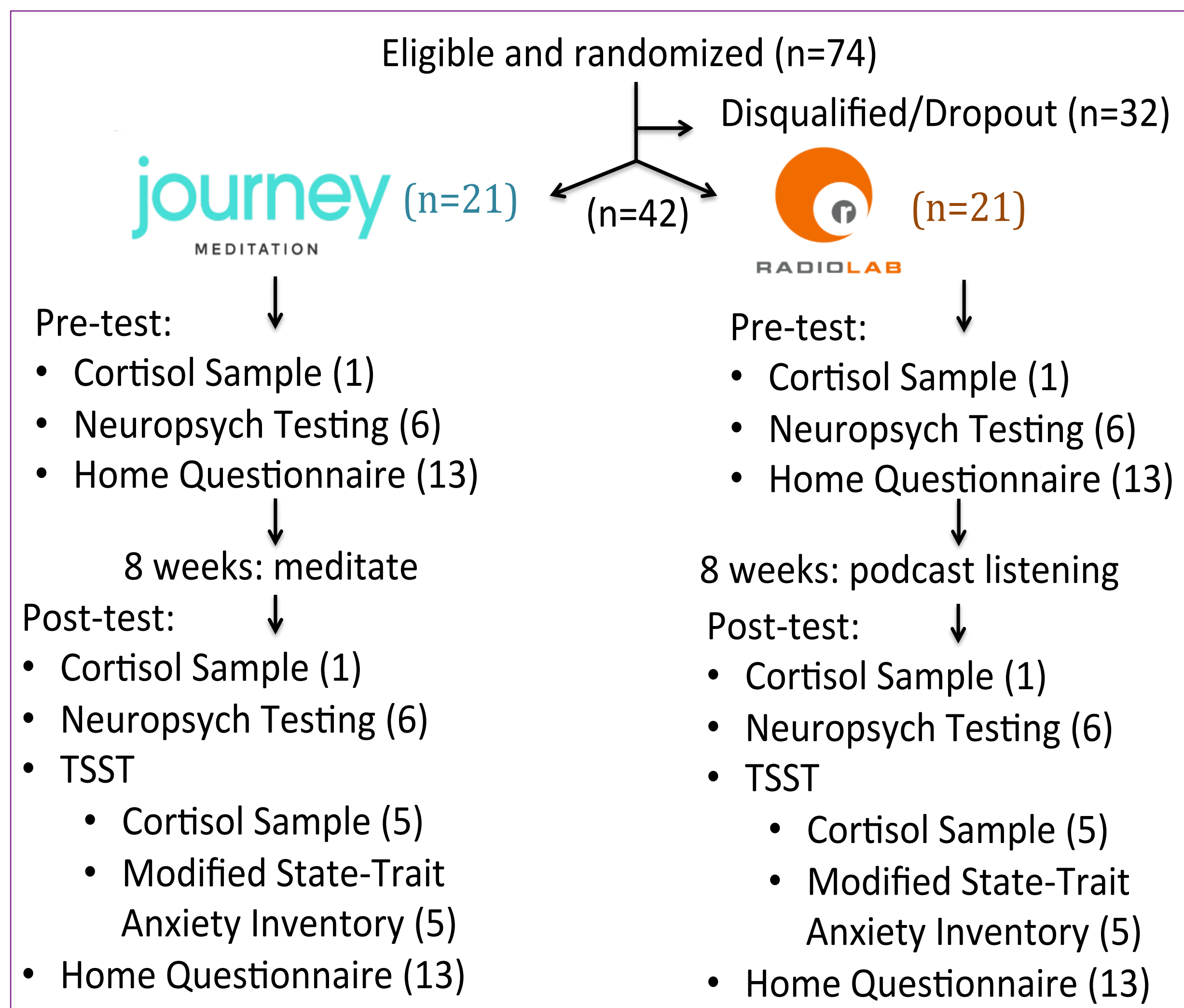


## Introduction

Meditation is an ancient practice that stems from Buddhist and Hindu cultures. A major purpose of meditation is to focus the mind, clearing it of the propensity towards wandering or unfocused thought [1]. Recent research assessing the capacity of meditation to change the brain has shown that meditation decreases stress, improves mood, boosts cognitive functioning, increases the brain's functional connectivity, and enhances alpha and theta power—brain states associated with relaxation [2] [3] [4]. There are a plethora of studies that have examined the effect of meditation in experienced meditators [5]. Few studies, however, have examined the effects of brief, daily meditation on cognitive functions in a randomized controlled design. To address this gap in the literature, we sought to examine whether 13 minutes of daily meditation practice in healthy adults could significantly improve cognitive functioning and mood as well as the emotional response to an acute stressor.

## Methods

- Randomized controlled design
- Healthy adults (18 to 45 years of age) with little to no experience meditating defined as meditating no more than once per week for the past three months
- Randomly assigned to 8 weeks of a listening to a daily, 13-minute meditation practice (n=21) or listening to a Radiolab podcast (control) (n=21)
- Pre- and Post-intervention testing: salivary cortisol levels, mood questionnaires, cognitive tasks, Trier Social Stress Test
- Repeated measures analysis of variance (ANOVA): Pearson's correlation; significance level of p<0.05



## Baseline Statistics

Test Category	Mean	Control	t-statistic
Total Fatigue Severity Score	32.71	29.62	t(40)=0.797, p=0.430
Total Mood Disturbance Score	33.33	23.24	t(40)=1.156, p=0.254
Beck Anxiety Inventory Score	11.238	9.429	t(40)=0.692, p=0.493
Stroop: Percent Correct Congruent Trials	0.97	0.98	t(40)=-0.948, p=0.349
Mnemonic Similarity Test: Recognition Memory Score	0.62	0.65	t(40)=-0.380, p=0.706
N-Back: Percent Correct Trials	0.62	0.72	t(40)= -2.125, p= 0.040

All of the following statistics were conducted to account for any pre-existing differences at baseline.

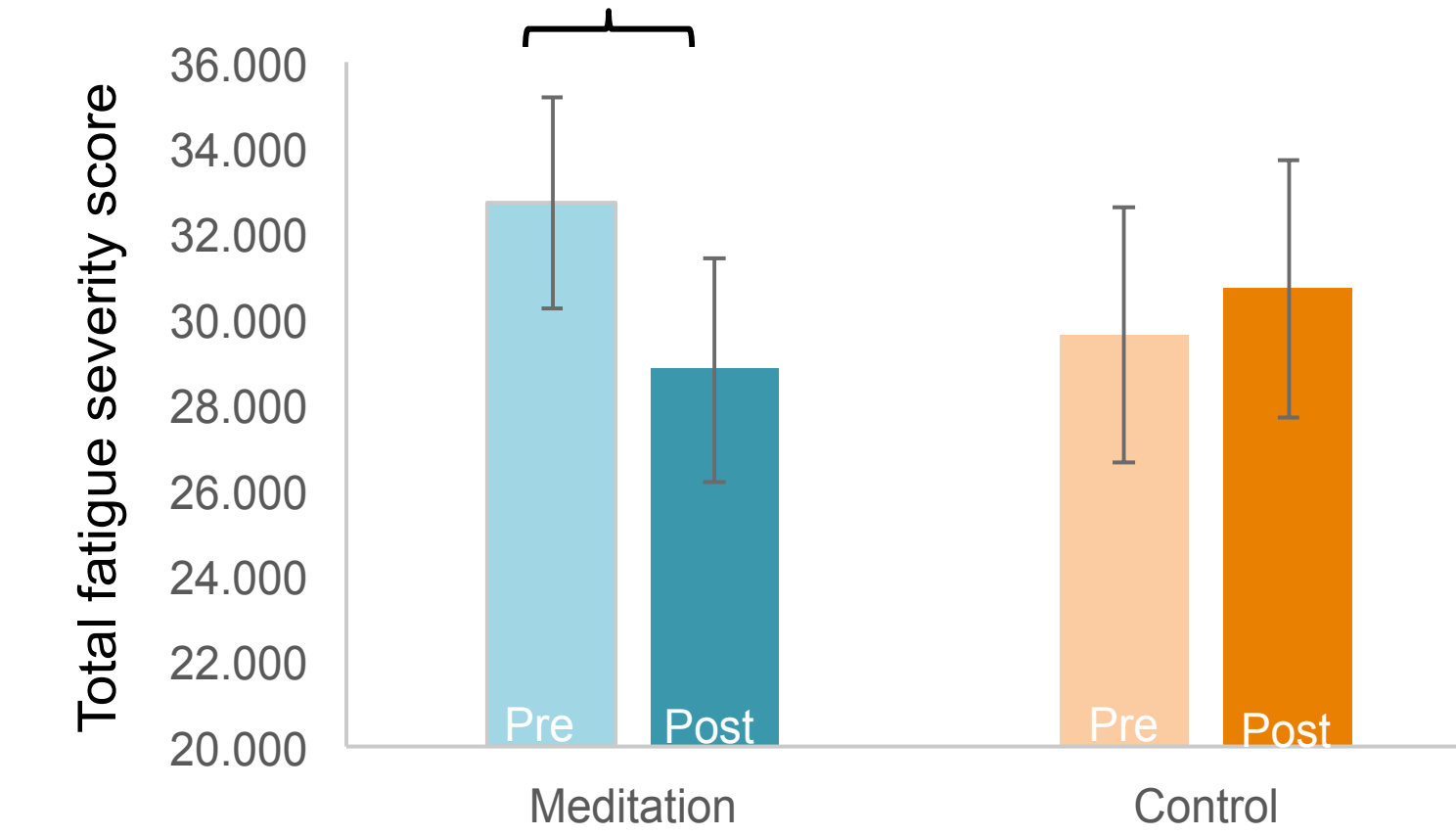
## Alexandra C. McHale, Julia C. Basso, Victoria J. Ende, Wendy A. Suzuki

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## Mood Data

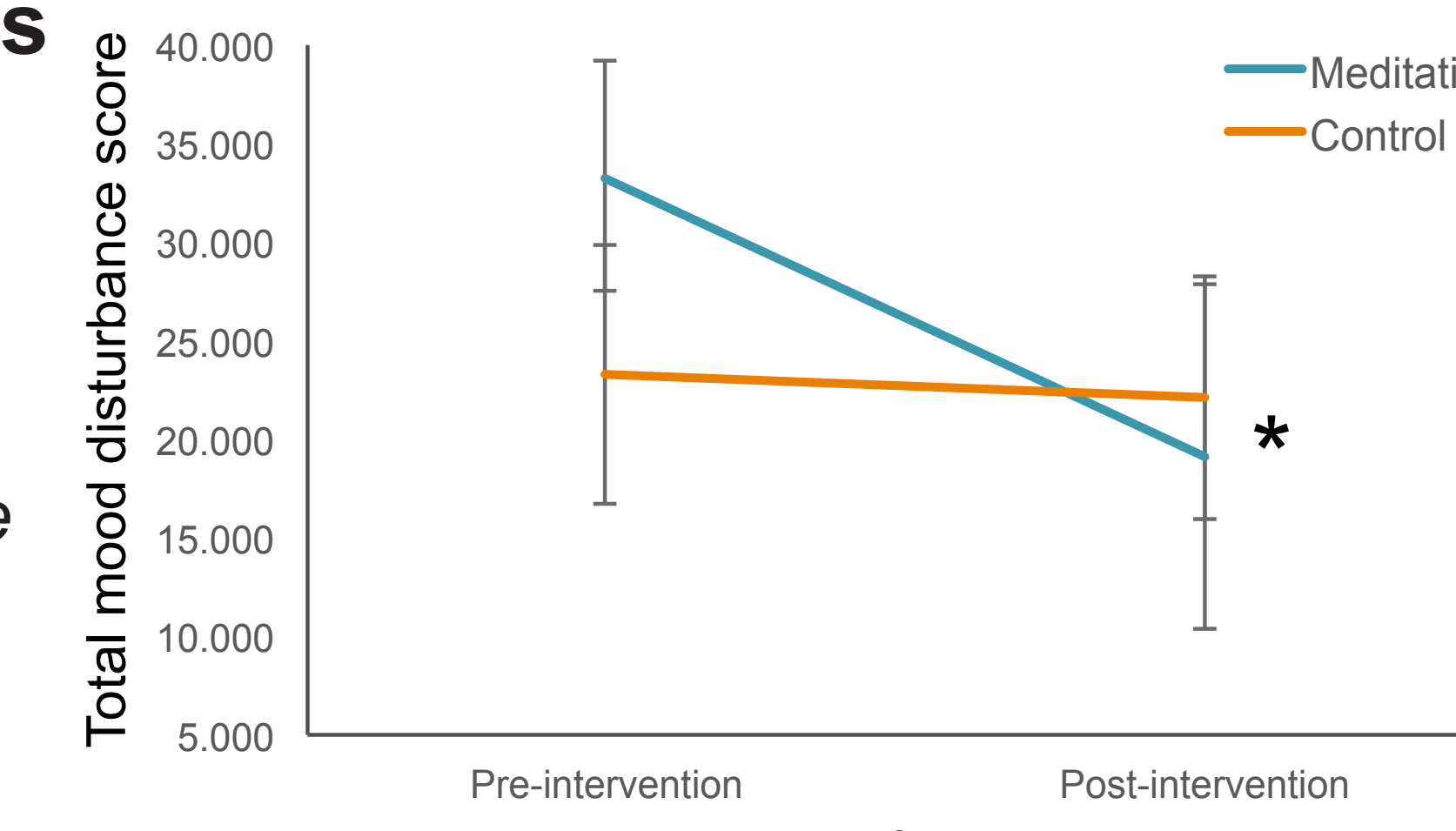
### Fatigue Severity Scale

Two months of meditation significantly decreased fatigue as measured by the Fatigue Severity Scale.



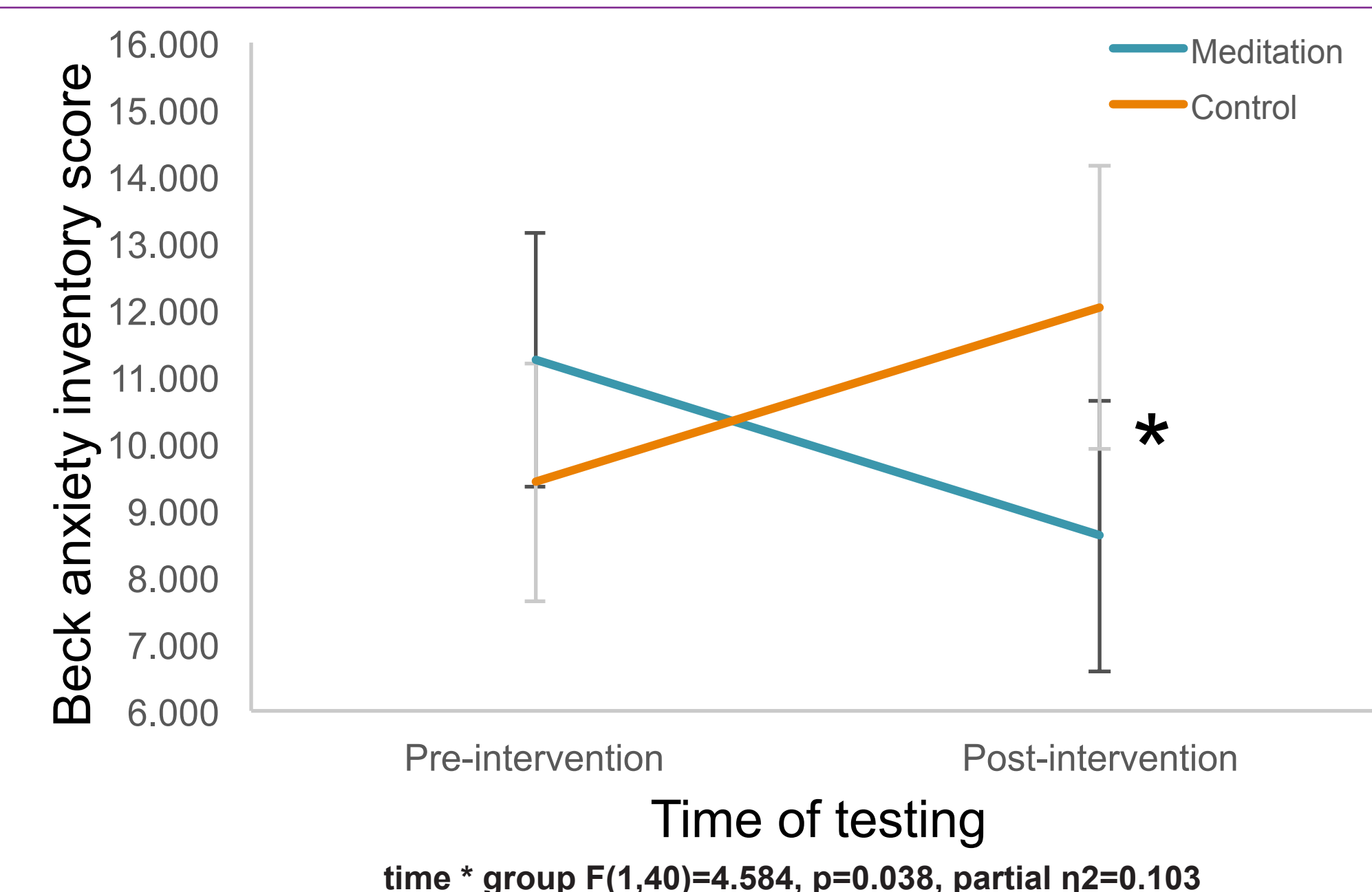
### Profile of Mood States

A significant interaction effect was found for the total mood disturbance measurement of the Profile of Mood States.



### Beck Anxiety Inventory

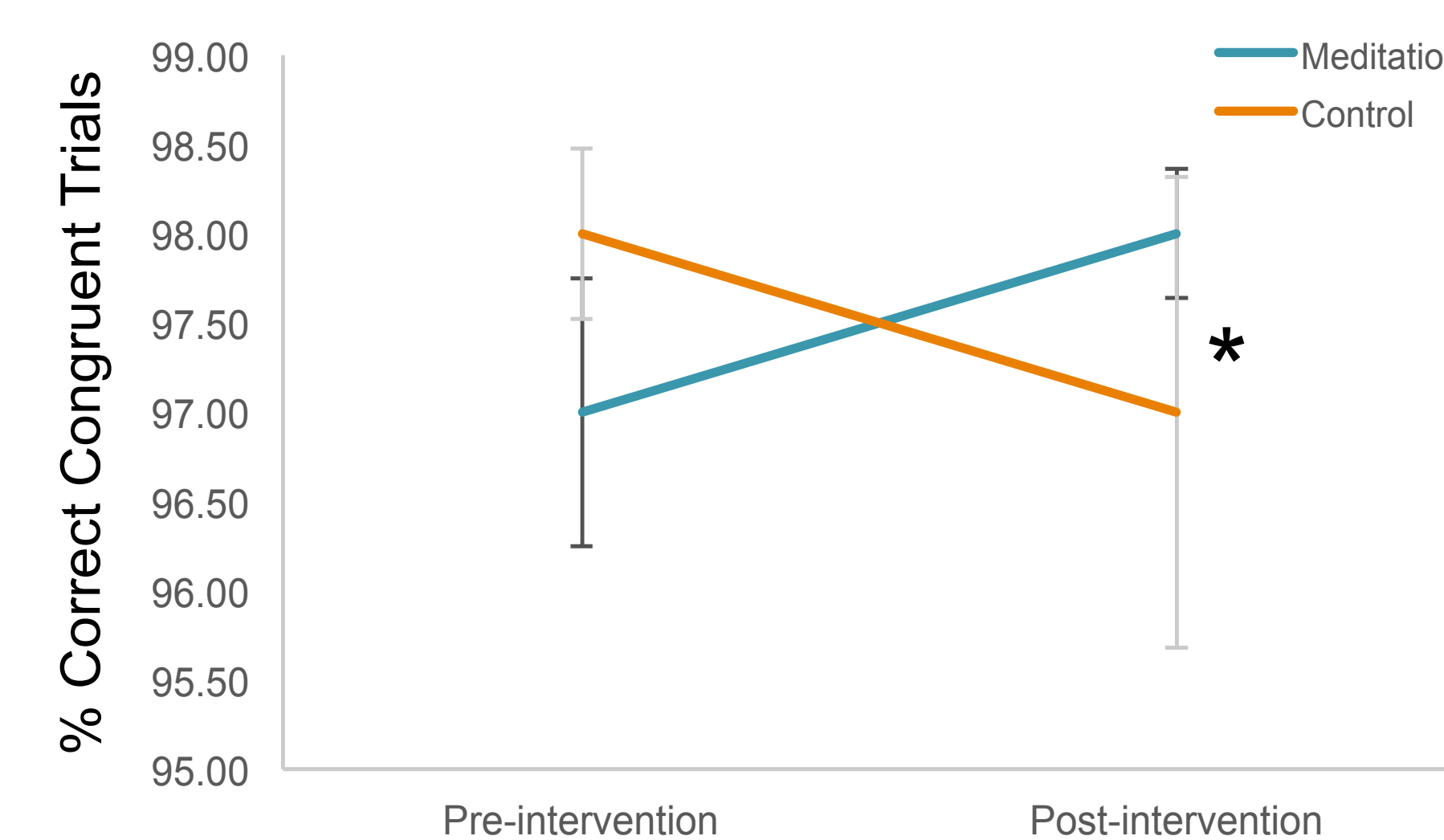
A significant interaction effect was found for anxiety level as measured by the Beck Anxiety Inventory.



## Cognitive Data

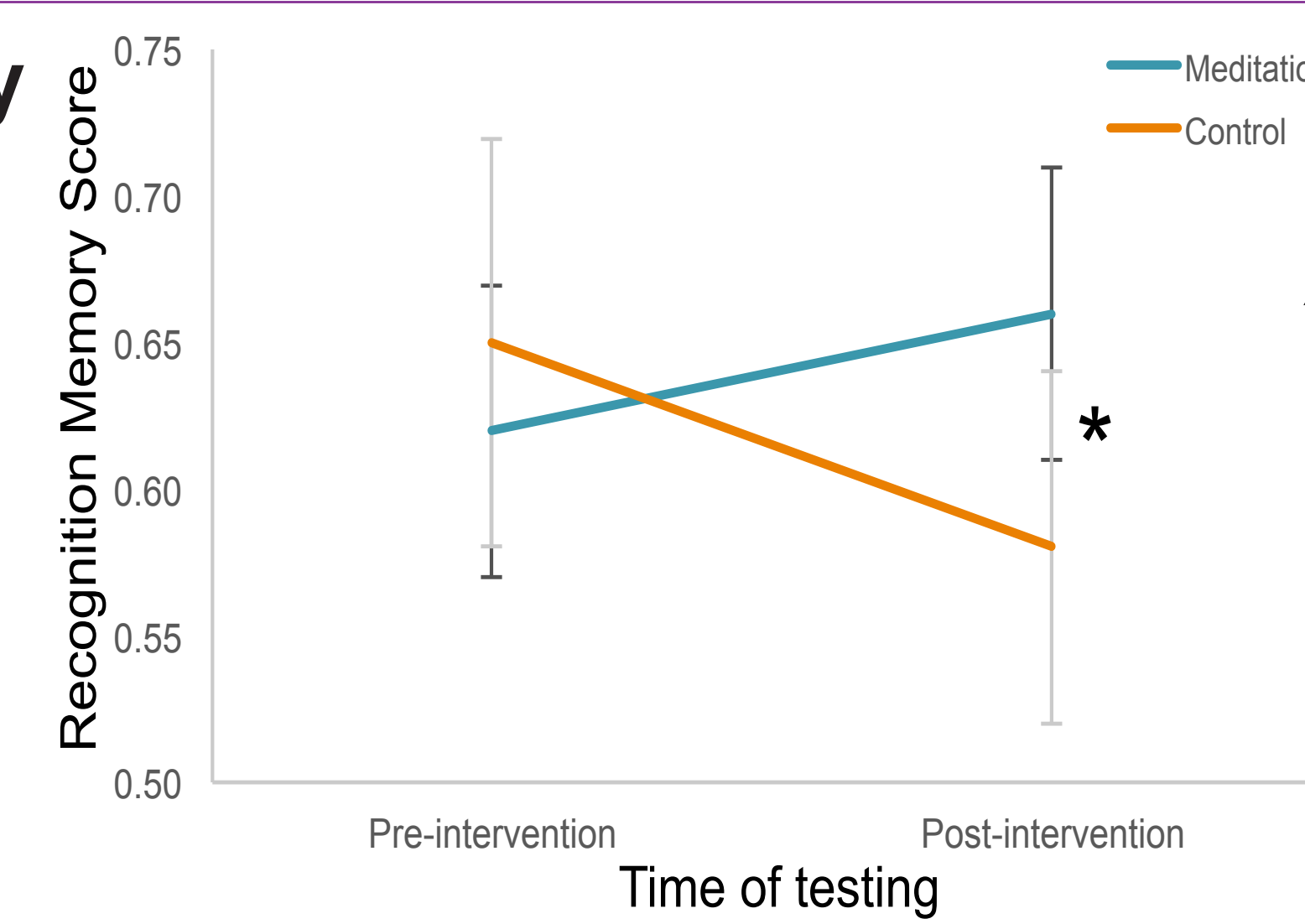
### Stroop Task

PURPLE YELLOW RED  
BLACK RED GREEN  
RED YELLOW ORANGE  
BLUE PURPLE BLACK  
RED GREEN ORANGE



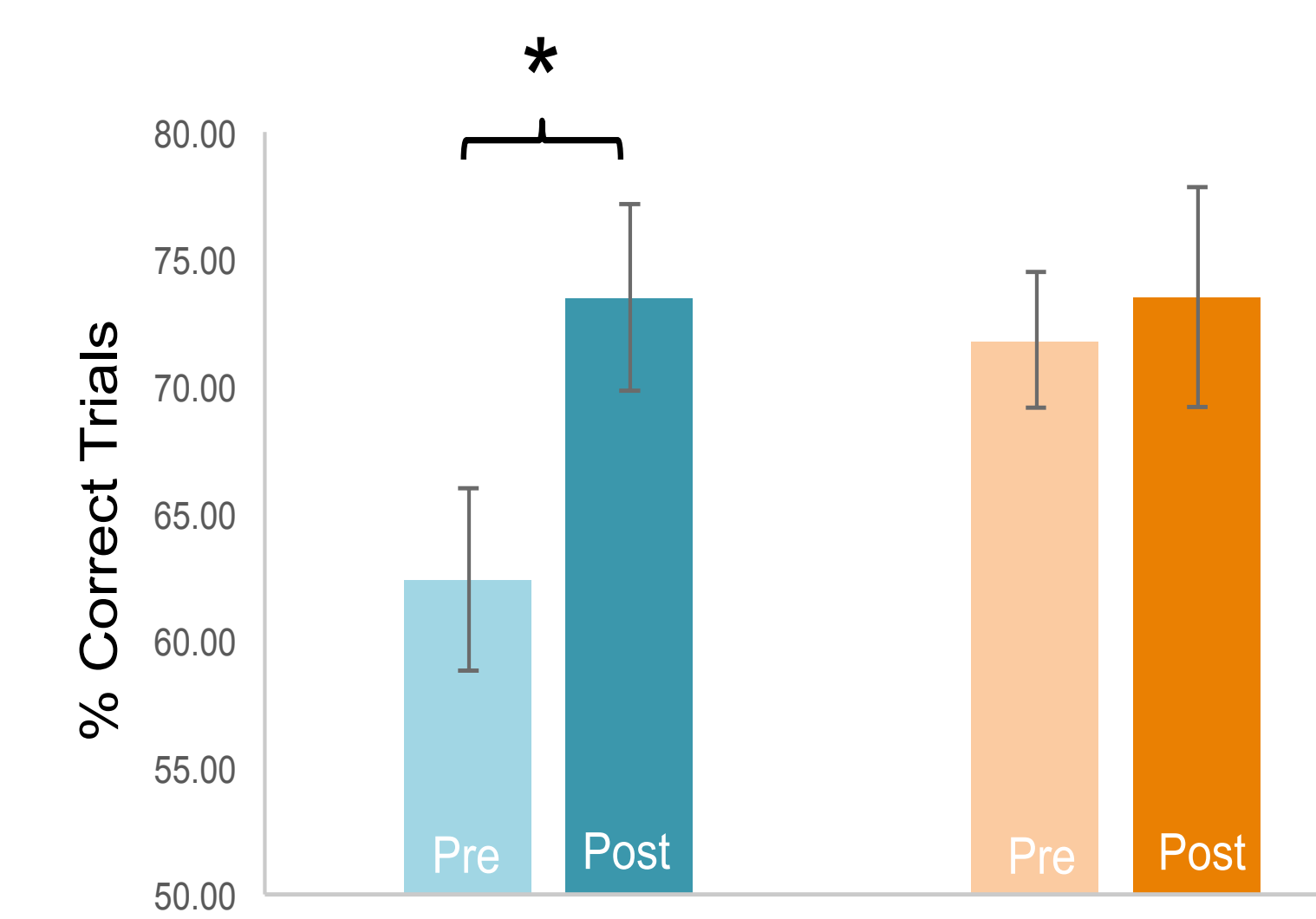
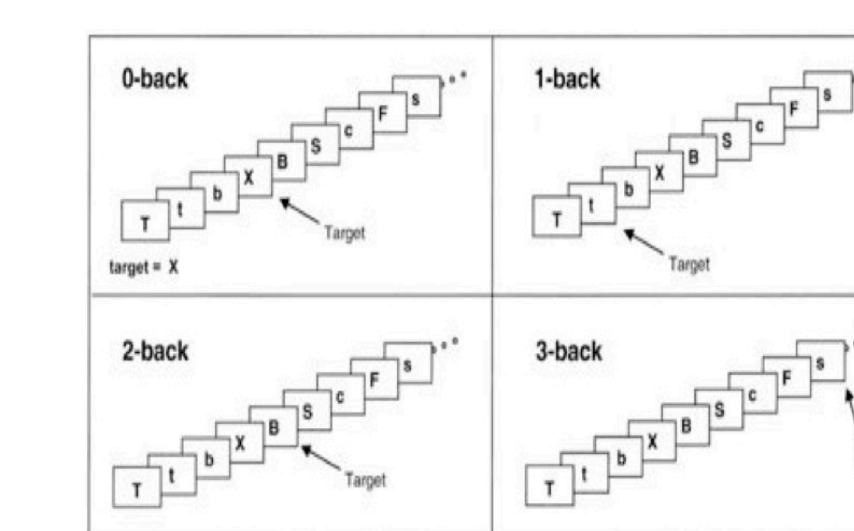
A significant interaction effect was found for the percentage of congruent trials answered correctly for the Stroop Color and Word Task.

### Mnemonic Similarity Task



A significant interaction effect was found for the traditional recognition memory component of the Mnemonic Similarity Task.

### N-Back Task

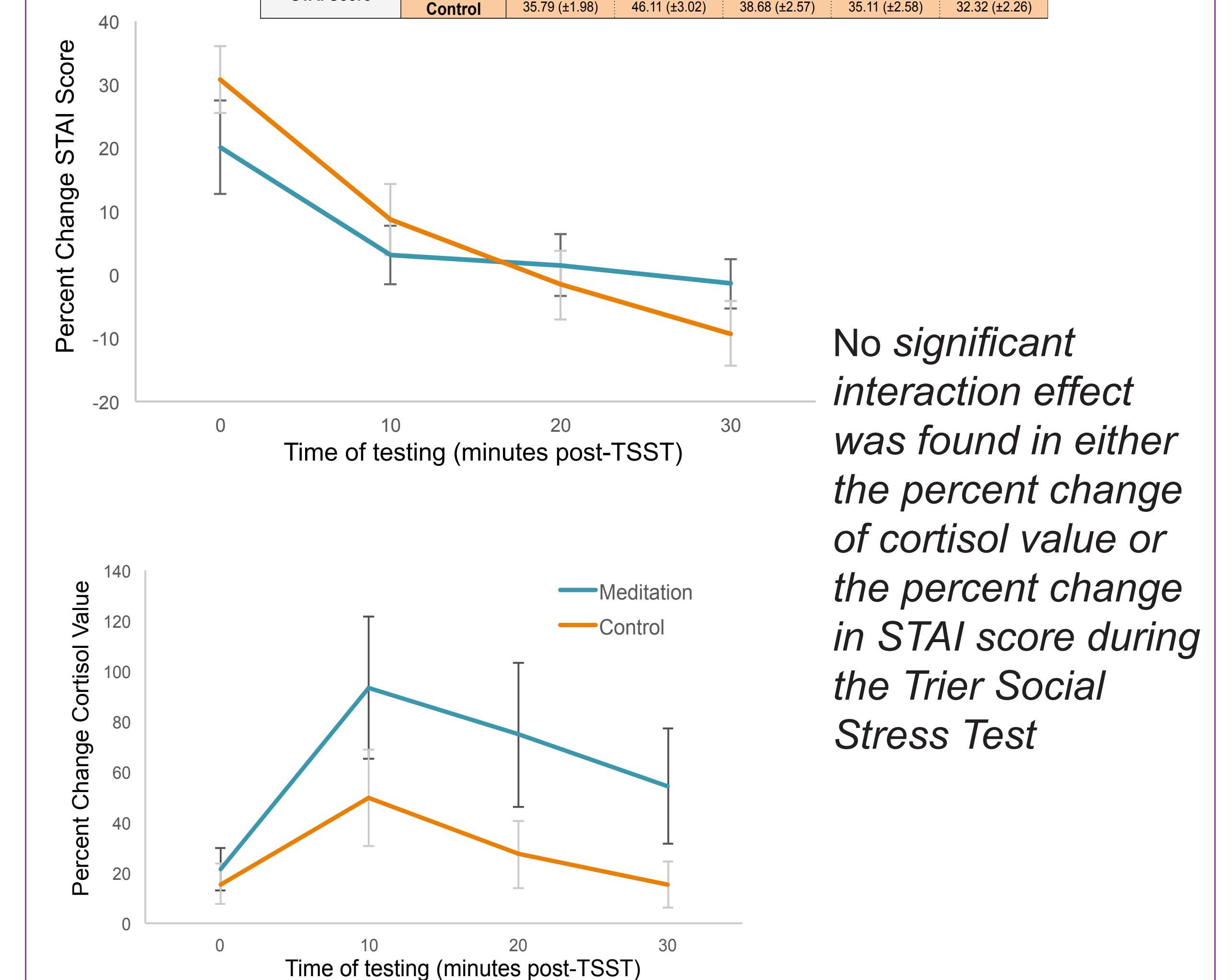


Two months of meditation significantly improved the percentage of all trials (0-, 1-, 2-, and 3-back) answered correctly for the N-Back Task.

## Acute Stress Test Data

### Trier Social Stress Test

Variable	Group	Time of Testing				
		Immediately Before	0 min	10 min	20 min	30 min
Cortisol Value (nmol/l)	Meditation	2.28 (±0.25)	2.71 (±0.30)	4.12 (±0.58)	3.65 (±0.54)	3.29 (±0.47)
	Control	3.11 (±0.38)	3.87 (±0.60)	4.32 (±0.54)	3.72 (±0.48)	3.46 (±0.47)
STAI Score	Meditation	34.10 (±2.23)	41.14 (±3.43)	35.57 (±3.40)	35.05 (±3.37)	34.33 (±3.37)
	Control	35.79 (±1.98)	46.11 (±3.02)	38.68 (±2.57)	35.11 (±2.58)	32.32 (±2.26)



## Conclusions

- 1) Two months of brief, daily meditation significantly decreased fatigue, mood disturbance, and anxiety.
- 2) Two months of brief, daily meditation improved attention, short-term memory, and recognition during pattern separation memory.
- 3) Two months of brief, daily meditation does not have a significant effect in decreasing acute stress response at the physiological and psychological level over the course of an acute stress test.

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