Conscious aging: Resilience, spirituality and awareness

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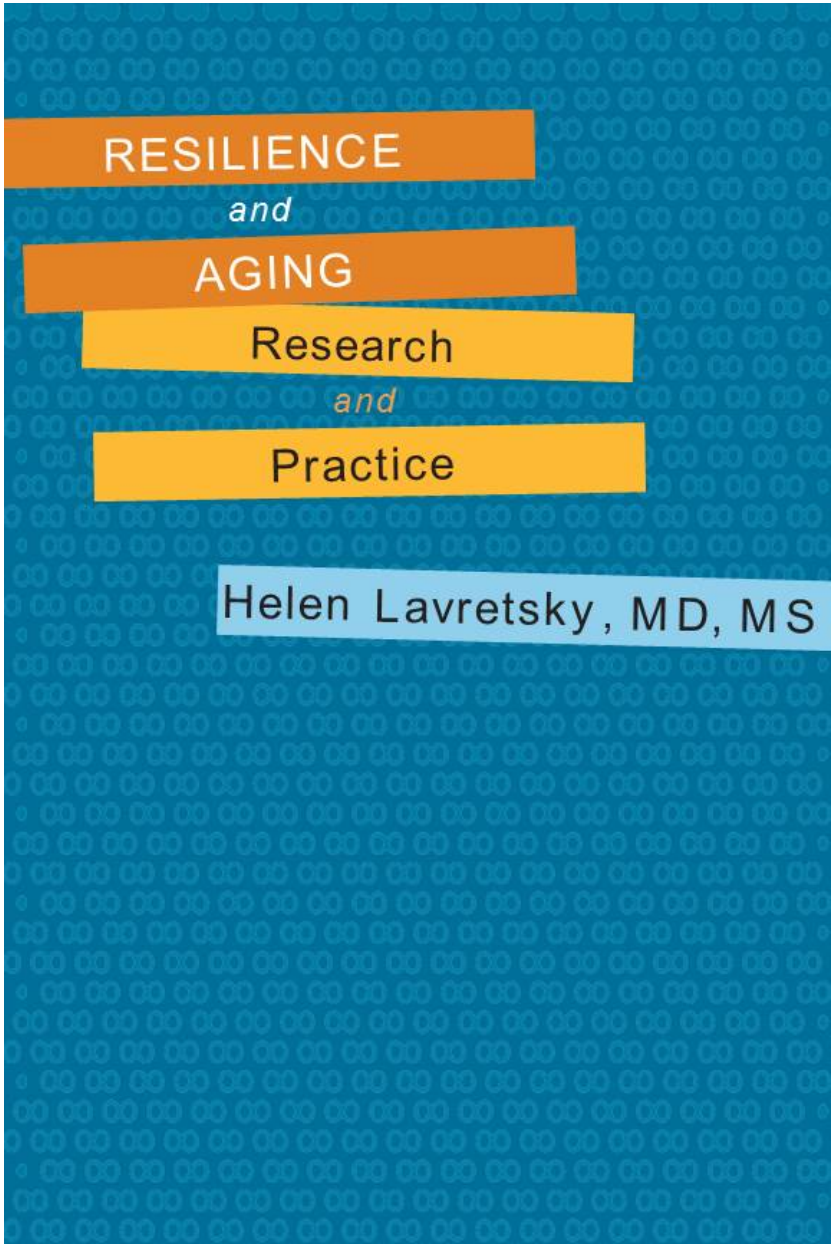
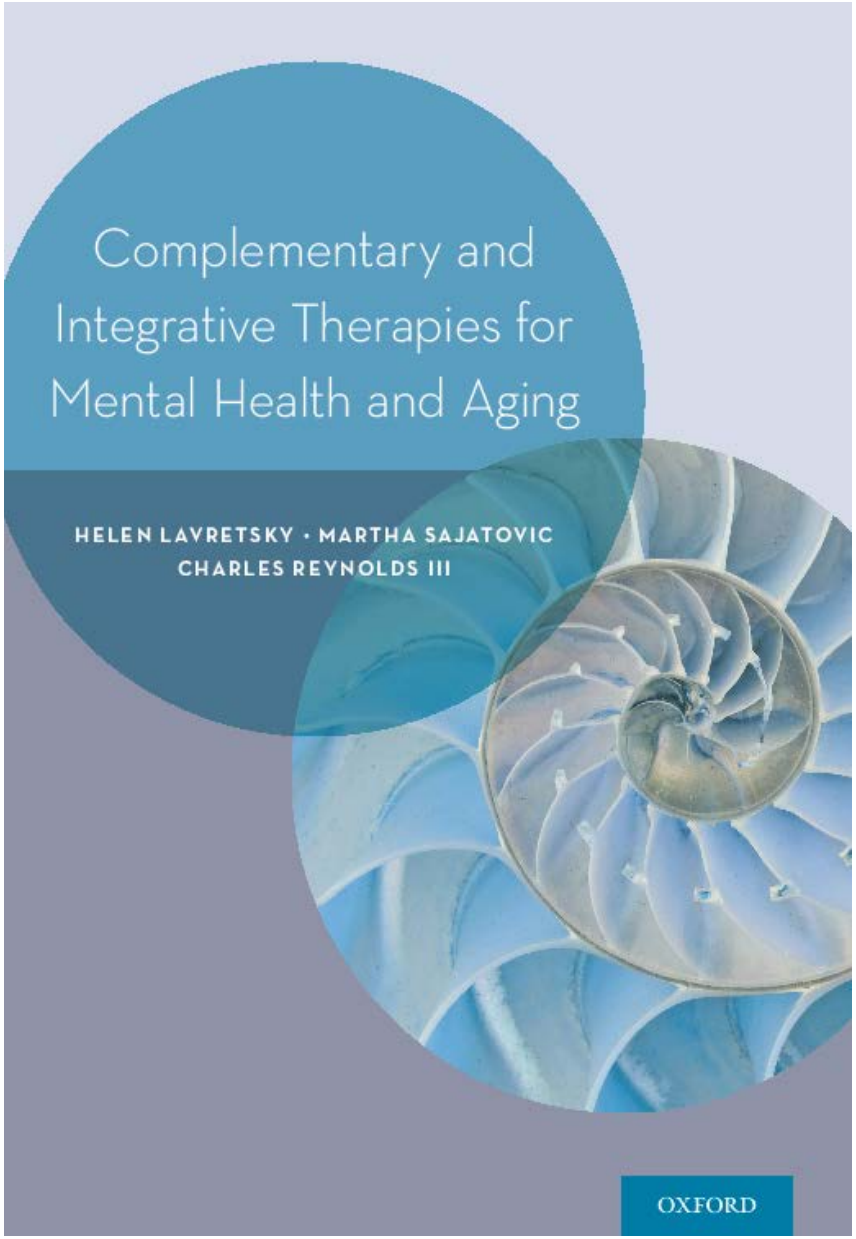
2018

- What I do professionally
- I am a geriatric psychiatrist and a neuroscientist studying mental and cognitive disorders of aging
- Study brain and health effects of mind body practices in aging
- Tai Chi and brain connectivity in geriatric depression
- Yoga for women (50+) with cardiovascular risk factors and subjective memory complaints (Alzheimer's Research and Prevention Foundation)
- Brain-Gut response to antidepressant treatment
- "Consciousness and health: deconstructing fear"
- What I do personally to advance my own awareness
- Certified Kundalini yoga teacher
- Spiritual practices- exploring many traditions and learn through my direct experience (shamanic healing, traditional Chinese medicine and acupuncture, Ayurveda, the use of herbs and supplements for aging, spiritual travel, world-wide meditation groups, etc)
- Redefining the relationship with death and dying as a part of living experience for myself and for others
- Greater awareness=Greater Consciousness=Happier and Simpler living through Joy and Gratitude via relaxing into the Universal Flow is my current process


RESILIENCE
and
AGING
Research
and
Practice
Helen Lavretsky, MD, MS

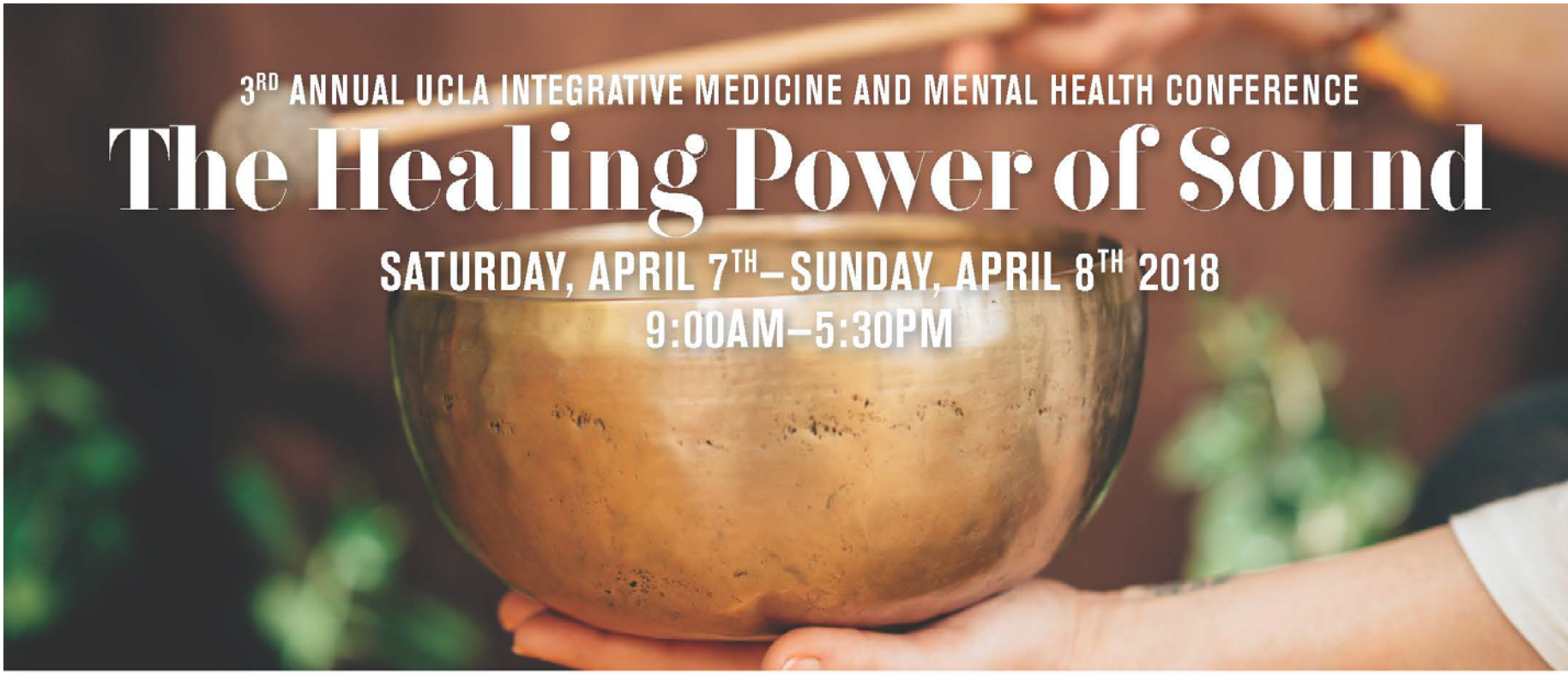

Complementary and
Integrative Therapies for
Mental Health and Aging
HELEN LAVRETSKY · MARTHA SAJATOVIC
CHARLES REYNOLDS III
OXFORD

BEST NEW AGE ALBUM OF THE YEAR 2017 – WHITE SUN II

https://youtu.be/LR5jqSZ6EwY

Art Can UNLEASH Your Creator-Self!

- ART is a Universal Language
- ART is an exercise in creating your own reality
- *ART Changes Consciousness: "Developing mastery in an art influences how we think about challenges and see the world. Every one of us has the potential to be an artist, to harness and express our innate wisdom and creativity."*
- *ART CAN HEAL!*



3RD ANNUAL UCLA INTEGRATIVE MEDICINE AND MENTAL HEALTH CONFERENCE

The Healing Power of Sound

SATURDAY, APRIL 7TH–SUNDAY, APRIL 8TH 2018

9:00AM–5:30PM

This two-day conference will provide experiential workshops and didactic lectures on the health effects of sound and music therapy.

ALL HEALTH PRACTITIONERS WELCOME

$50 per day or $100 for 2 days
50% discount for trainees/paraprofessionals

UCLA SEMEL INSTITUTE

C-Floor Auditorium (C8-183)

LEARNING OBJECTIVES:

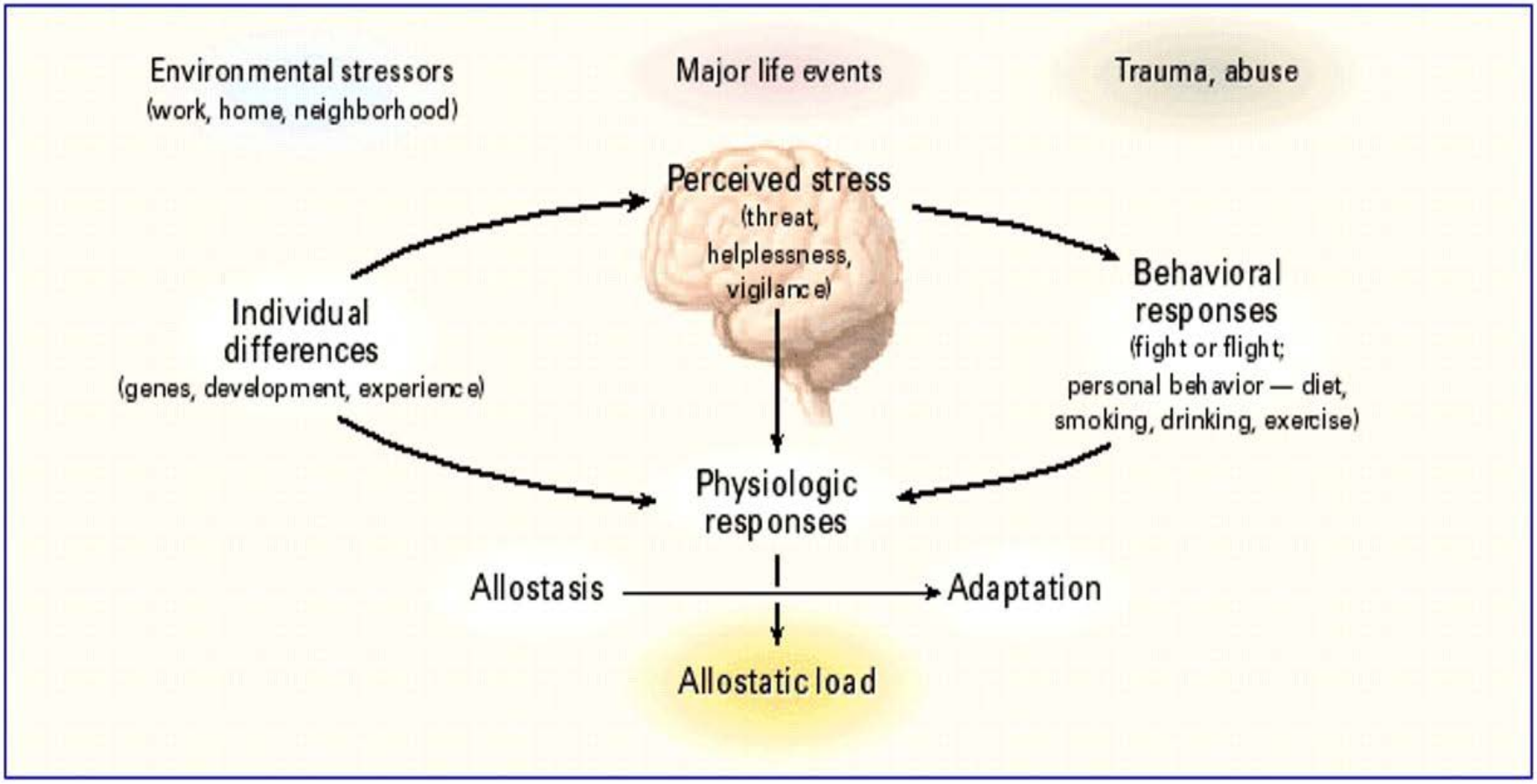
- Participants will learn about the use of sound healing and music therapy for treatment and prevention of mental and physical disorders.
- Participants will learn about brain and health effects of sound healing and music therapy.
- Participants will experience different techniques of sound healing and music therapy.

Register today 310-825-1333 or visit www2.semel.ucla.edu/integrativementalhealth

ANCIENT CONTEMPLATIVE PRACTICES

- >5000 years old –train to quiet and free minds, to become more independent from cultural influence
- Yoga, meditation, aikido, prayer rituals and Tai Chi/Qi Gong are systems of practice designed to help free consciousness, change how we experience the world
- Connects us to our Soul/ Authentic Self= by cultivating awareness, buddha nature, spirit, Creator Self
- We experience ourselves as living works of art, children of God, Nature or Mother Earth, unique expressions of the larger Universe that surrounds us

Model of Stress and Health:



What is yoga?

- Ancient system of philosophies, principles and practices
- Developed more than 5,000 years ago.
- Breath control (pranayama), specific bodily postures (asanas and mudras), and meditation.
- World-wide use for health and stress-reduction.

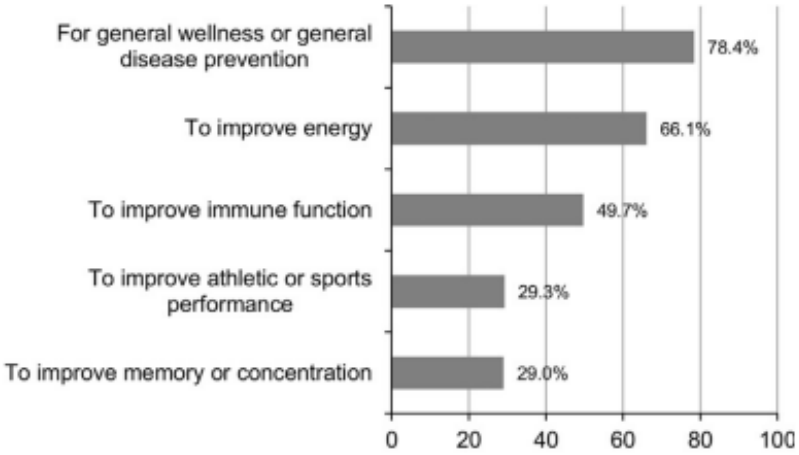
Prevalence of Yoga

- About 31 million U.S. adults have ever used yoga
- About 21 million practiced yoga in the past 12 months

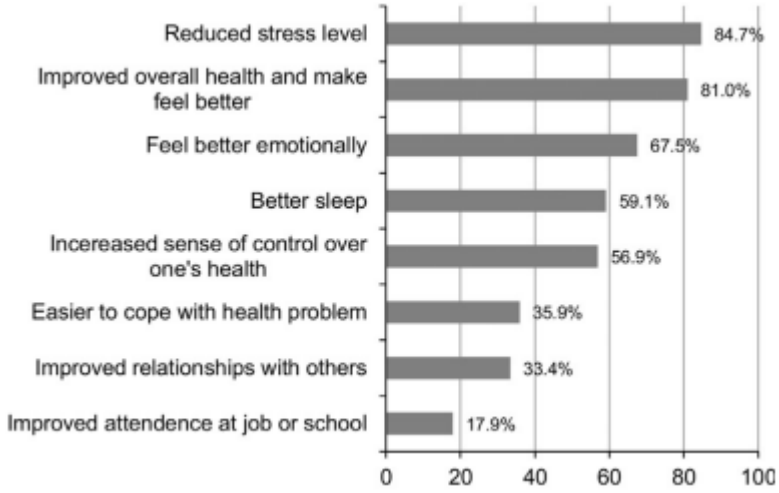
Characteristics	Never used yoga (*n*=195,971,306)	Ever used yoga (*n*=30,998,492)	Used yoga in the past 12 months (*n*=20,955,758)
Age (years)			
18 to 29	40,840,640 (20.8)	8,443,980 (27.2)	6,160,335 (29.4)
30 to 39	31,133,741 (15.9)	7,277,198 (23.5)	5,201,014 (24.8)
40 to 49	35,198,461 (18.0)	5,353,250 (17.3)	3,656,161 (17.4)
50 to 64	51,406,839 (26.2)	7,056,198 (22.8)	4,425,359 (21.1)
65 or greater	37,391,625 (19.1)	2,867,866 (9.3)	1,512,889 (7.2)

Cramer et al, 2016, Am J Prev Med

Most Frequently Reported Reasons for Practicing Yoga



Most Frequently Reported Outcomes of Practicing Yoga



Cramer et al, 2016, Am J Prev Med

Biological mechanisms of yoga

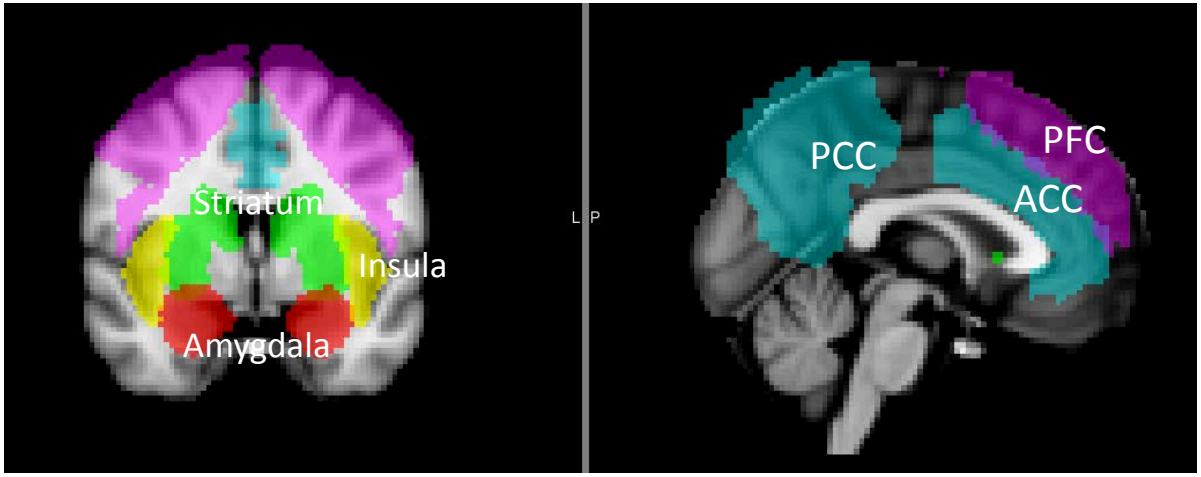
- **Streeter and colleagues** (2012): yoga reverses stress by counteracting imbalances of the autonomic nervous system (ANS), with decreased parasympathetic nervous system (PNS) and increased sympathetic nervous system (SNS) activity.
- Yoga-based practices increase activity of the PNS and GABA system -increases GABA levels in the thalamus correlated with improved mood.
- Hypothalamic–pituitary–adrenal (HPA) axis with reductions in plasma cortisol- A review of 81 studies found that yoga surpassed exercise regimens in numerous outcome measures of health such as salivary cortisol, blood glucose, fatigue, pain, and sleep in both healthy and clinical samples
- One study of yoga found an associated with increased dopamine release in the ventral striatum, a major area of the brain's reward system .

Acevedo, Lavretsky 2016

Randomized Controlled Trials of Yoga for the Disorders of Aging

	Positive Findings	Uncertainty
Hypertension	22 pooled showed decline in both systolic and diastolic blood pressure (−4.17 and −3.26 mmHg, respectively)	The type of yoga but not duration- yoga with postures, meditation, and breathing had larger reductions of −8.17 (systolic) and −6.14 (diastolic) mmHg
Osteoporosis	In 2 studies, yoga practice increases muscular strength of specific groups, and muscle endurance for repetitive tasks, and delay bone loss and prevent fractures.	Anecdotal reduction in osteopenia
Insomnia	One cluster randomized trial of Silver yoga	Unclear benefit for comorbid features like pain
Stroke	Several studies for emotional lability, poststroke hemiparesis improves	Unclear benefit for prevention
Dementia	1 study with Preventing Loss of Independence through Exercise (PLIÉ) (Tai Chi, yoga, Feldenkreis, and dance movement)- improved memory	1) Functional changes included increasing body awareness, movement memory and functional skills. 2) Emotional changes included greater acceptance of resting, and a positive attitude towards exercise. 3) Improved coherent social interactions
Diabetes	2 studies with significant positive effects. decrease in glucose, HbA(1c), lipids, cortisol, ferritin, MDA and a significant increase in catalase activity	very few studies
Osteoarthritis	Several smaller studies for OA	1) Sleep improved but not pain.
Healthy aging	Prevention of depression, cognitive decline, osteoporosis in high risk groups	Yoga has a very important role to play in this as it influences physical, intellectual, emotional and spiritual dimensions of life.

Neural mechanisms of mindfulness meditation



- **Prefrontal cortex** -cognitive processing and executive control, attention
- **Anterior and posterior cingulate-** mood regulation, memory
- **Insula** -sensory awareness
- **Striatum**-reward, learning, and motivation
- **Amygdala** -Emotional processing (fear, anxiety)

Acevedo, Lavretsky 2016

Neural mechanism differences between mindfulness and mindful exercise

- *Unique to mindfulness- four regions*

- Premotor area (PMA)
- Mid-cingulate
- Angular gyrus (AG)
- Primary and secondary somatosensory cortex (SSI and II)
- =Areas of motor and emotional, and somatosensory integration- greater awareness of Self=Consciousness
- Can be used for treatment of mood disorders, anxiety, ADHD, impulsivity, movement disorders, stress

- *Unique to yoga-based practices- seven regions*

- Dorsolateral prefrontal cortex (DLPFC)
- Medial frontal cortex
- Superior temporal area
- Paracentral lobe
- Precentral and postcentral gyrus
- Superior parietal lobule (SPL)
- =Areas of judgment- discernment; memory, language; visual-spatial and somatosensory integration =Social cognition/behavior
- Useful for enhancing judgement and self-control on deliberate actions
- Can be used-criminal system, at risk youth, substance abuse, mood disorders, neurological illness, dementia, cognitive decline, caregiver stress

Acevedo, Lavretsky 2016

Yogic meditation to reduce stress and improve functioning in family dementia caregivers

- Sponsored by the Alzheimer's Research Prevention Foundation
- To compare psychological, cognitive, and neurobiological effects of yogic meditation versus relaxation in stressed and depressed family dementia caregivers
- Practice for 12 minutes per day for 8 weeks.

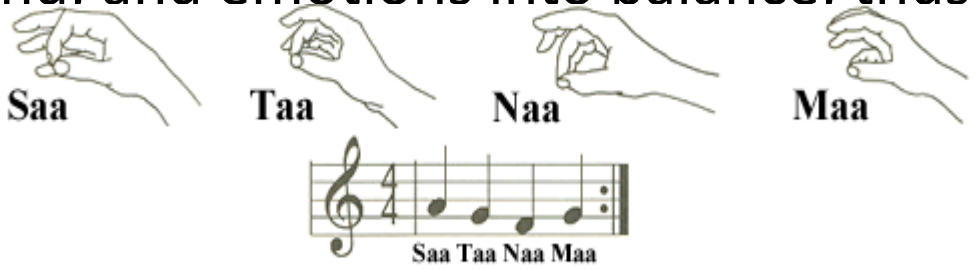
Lavretsky et al 2012; Black et al 2013; Pomykala et al 2013

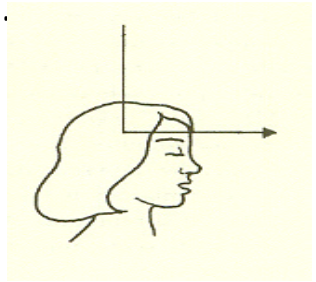
Kirtan Kriya versus Relaxation for stressed dementia caregivers

- 39 stressed caregivers with minor depression randomized to 12 minutes per day meditation versus listening to music tapes for 8 weeks
- NEW CONCEPT: " I have 20 minutes to myself"
- Breathing and chanting versus relaxing
- Distress, depressive symptoms, anxiety, burden
- Cytokines, cortisol, catecholeamines, cognition, PET scan, fMRI, NFkappaB, telomerase, gene expression

What is Kirtan Kriya?

- **Kirtan Kriya** is a 11-minute chanting exercise in the Kundalini yoga tradition that people have been practicing for thousands of years. This meditation involves repetitive finger movements, or mudras, plus verbal chanting and silent chanting of the mantra "Saa Taa Naa Maa."
- **What does Kirtan Kriya mean in English?**
  A kirtan is a song. These ancient primal sounds from Sanskrit mean "birth, life, death, rebirth." Kriya refers to a specific set of movements or chants.
- In the yogic tradition, kriyas are used to help bring the body, mind. and emotions into balance. thus crea healing
-



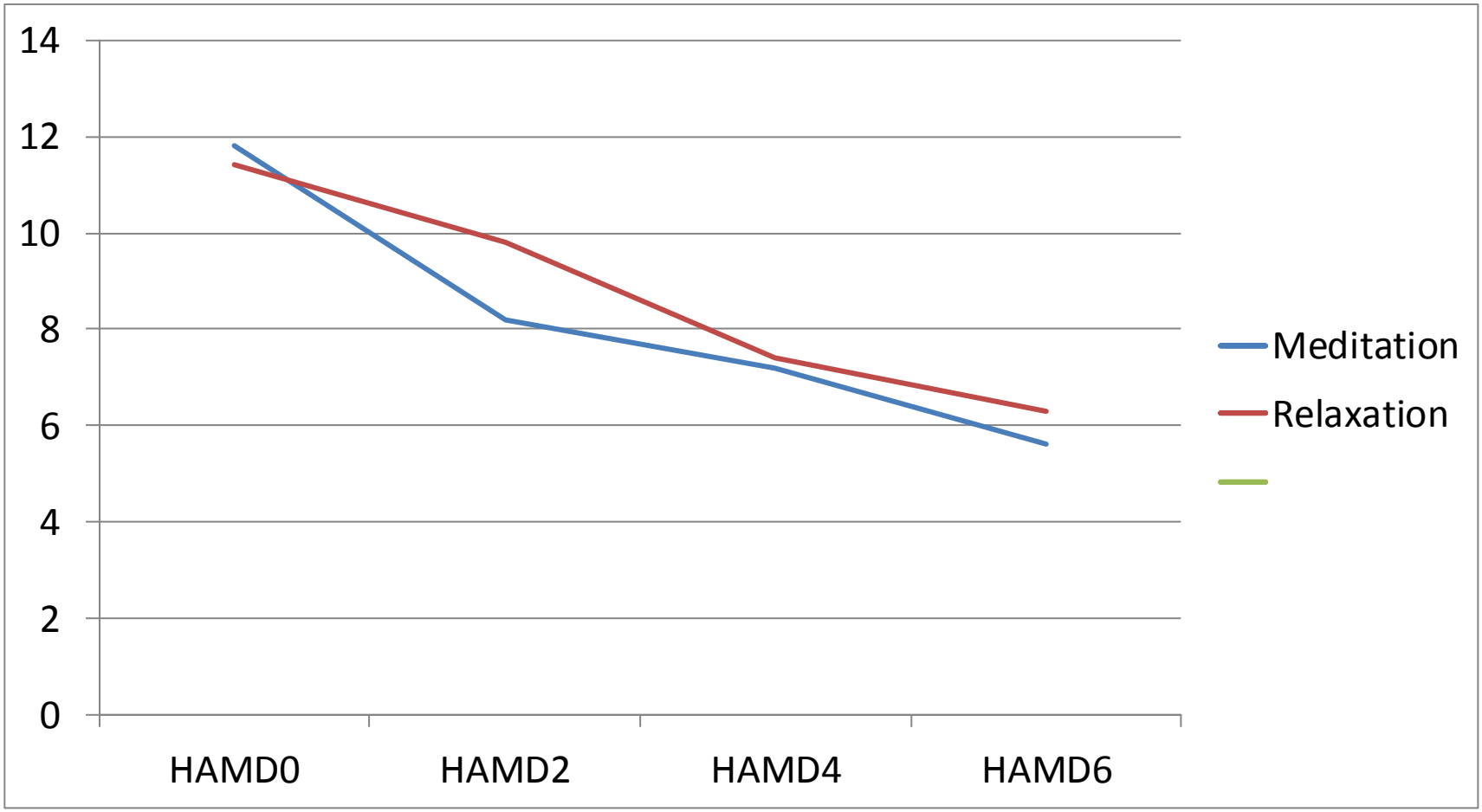


•Focus of attention

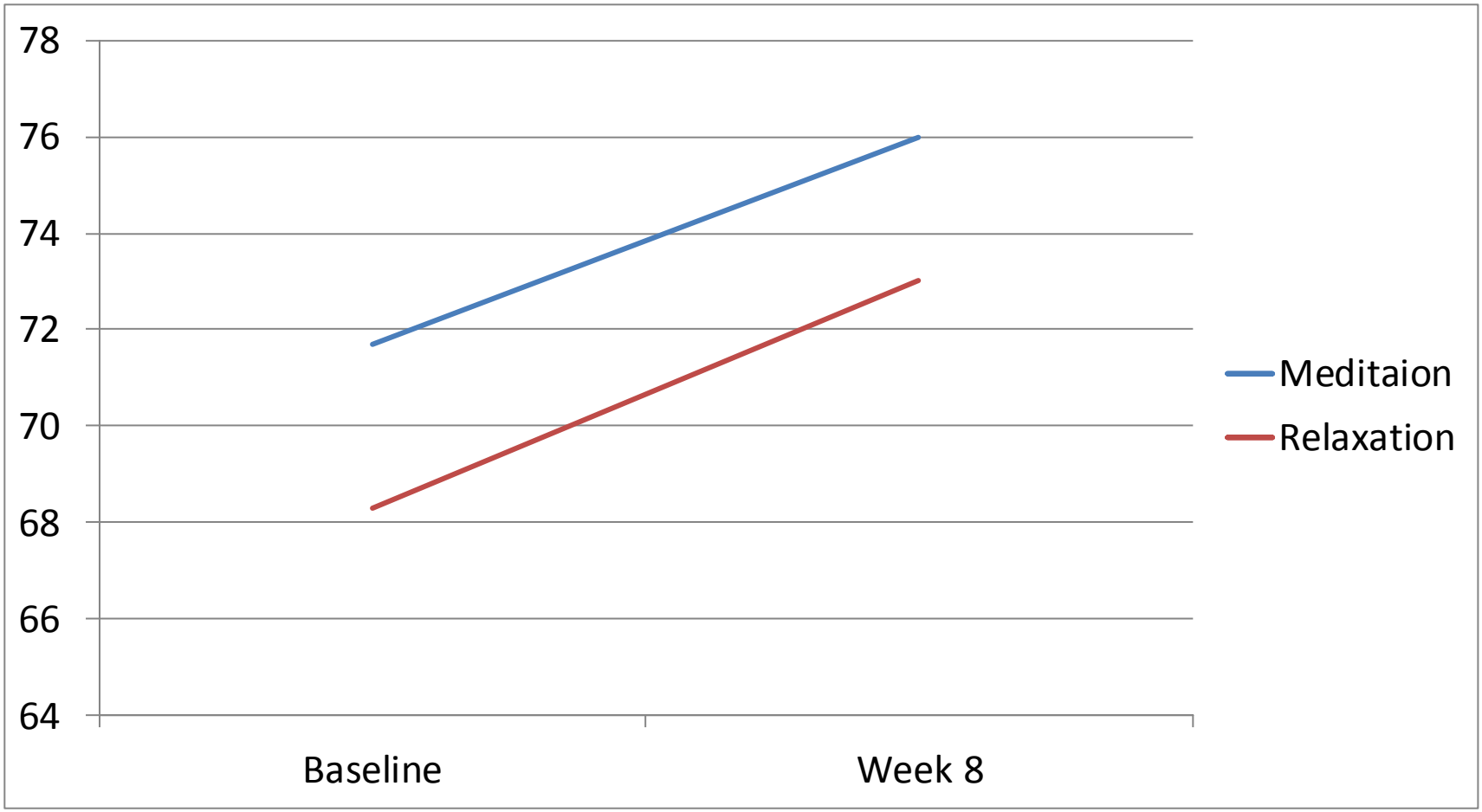
Group comparison in 39 completers

Variables	Meditation (N=23)	Relaxation (N=16)	t; P
Age	60.5 (8.2)	60.6 (12.5)	0.03; 0.9
Education	16.1 (2.1)	15.1 (2.8)	-1.2; 0.2
Month of depression	45.1 (35.4)	39 (21.2)	-0.6; 0.5
Yrs of caregiving	4.7 (2.4)	4.2 (2.9)	-0.6; 0.6
Hours per week	47.8 (35.8)	63.3 (36.2)	-0.2; 0.2
CIRS	3.0 (2.3)	4.6 (3.1)	1.8; 0.08
CVRF	5.2 (3.7)	7.4 (6.4)	1.4; 0.2
HAMD baseline	11.8 (4.1)	11.4 (4.0)	-0.3; 0.7

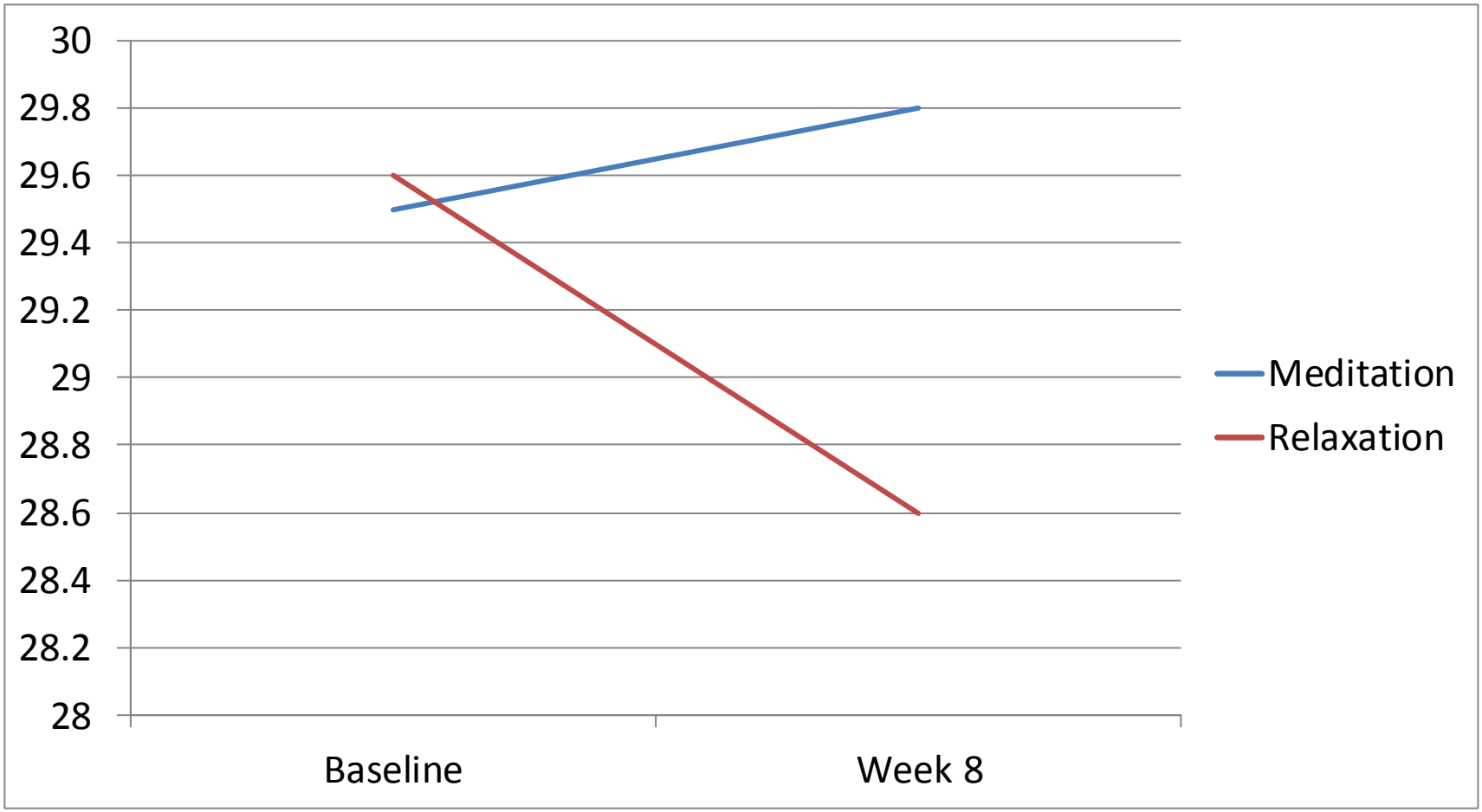
HAMD scores over time



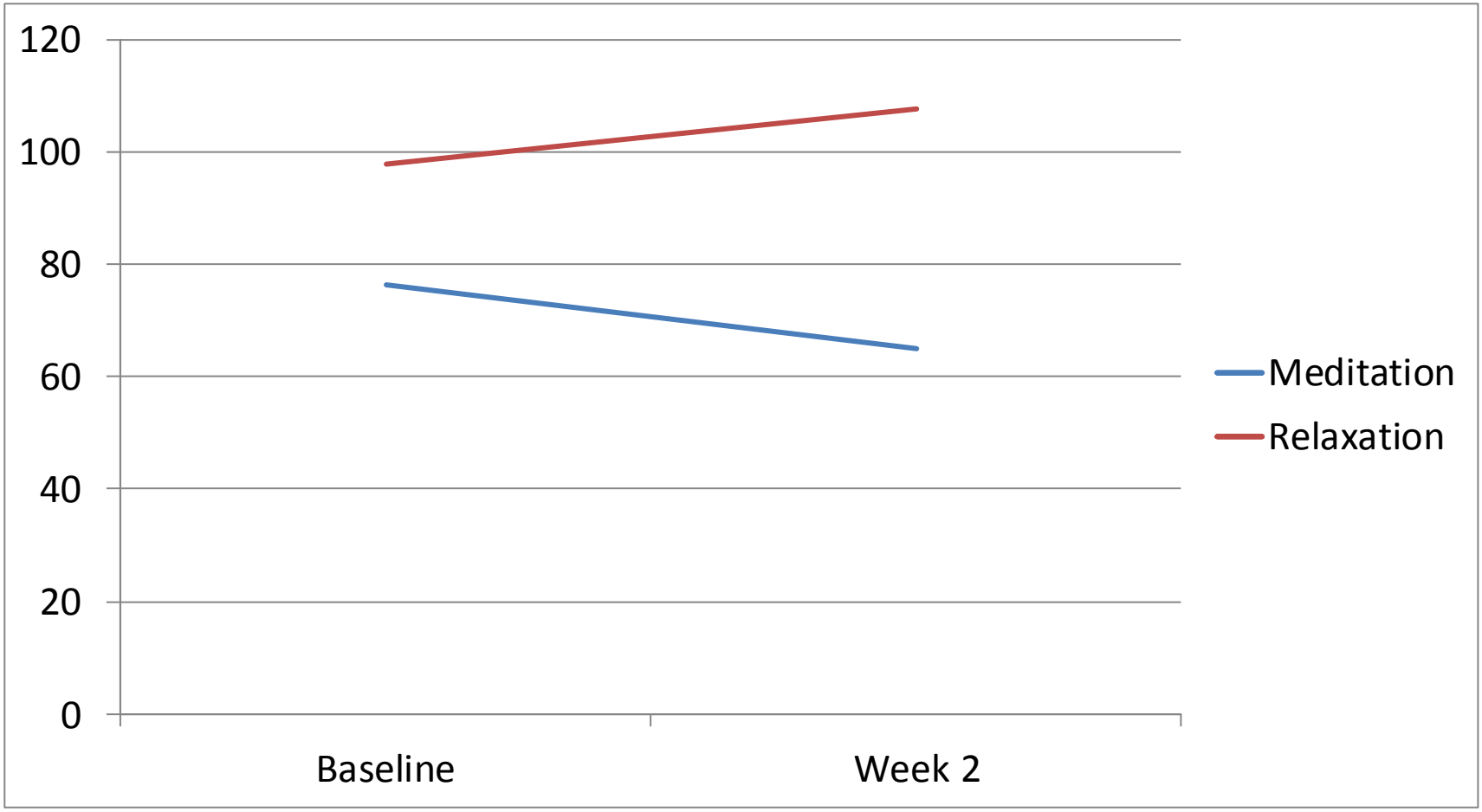
Resilience



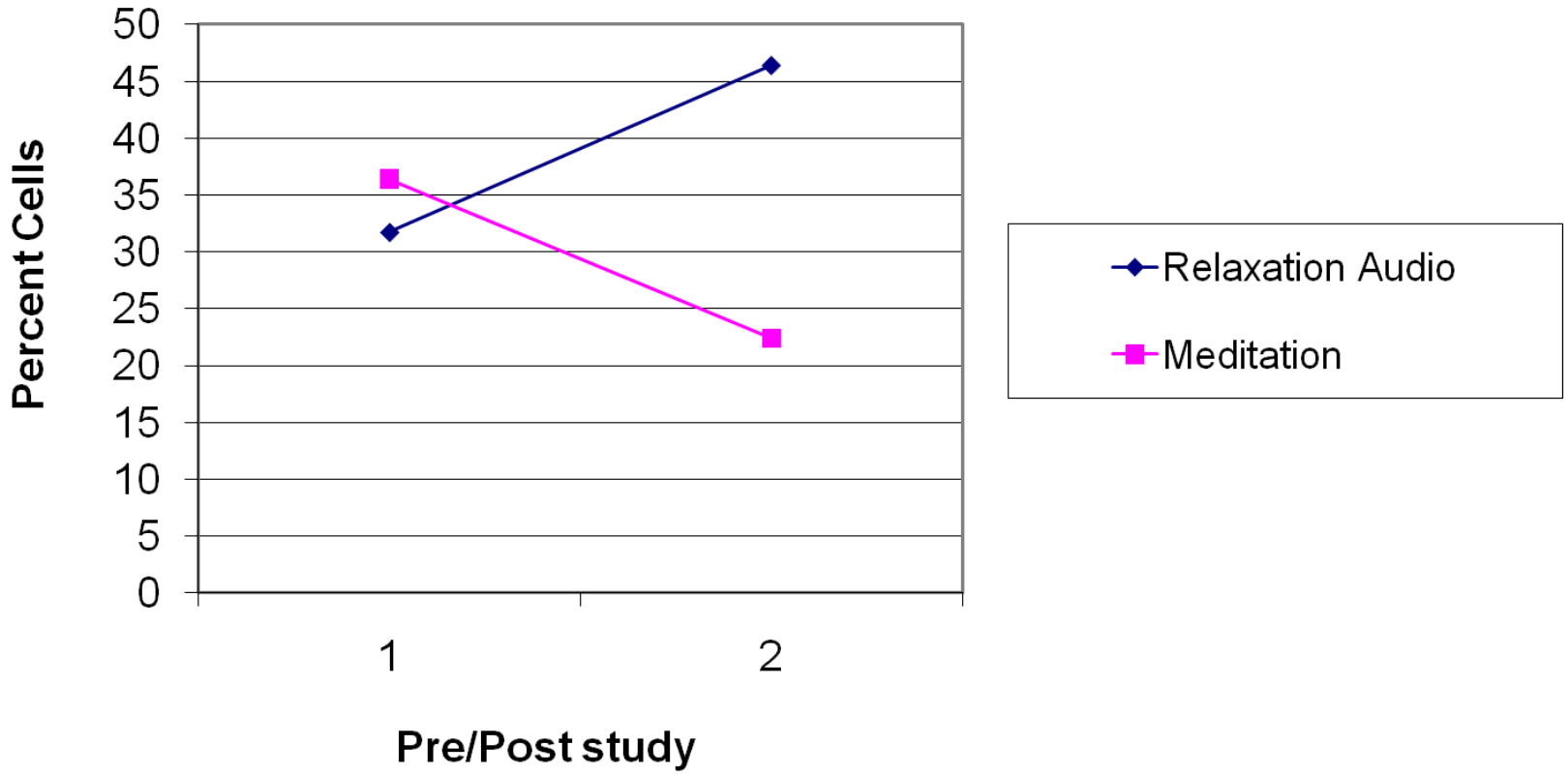
Cognition-MMSE



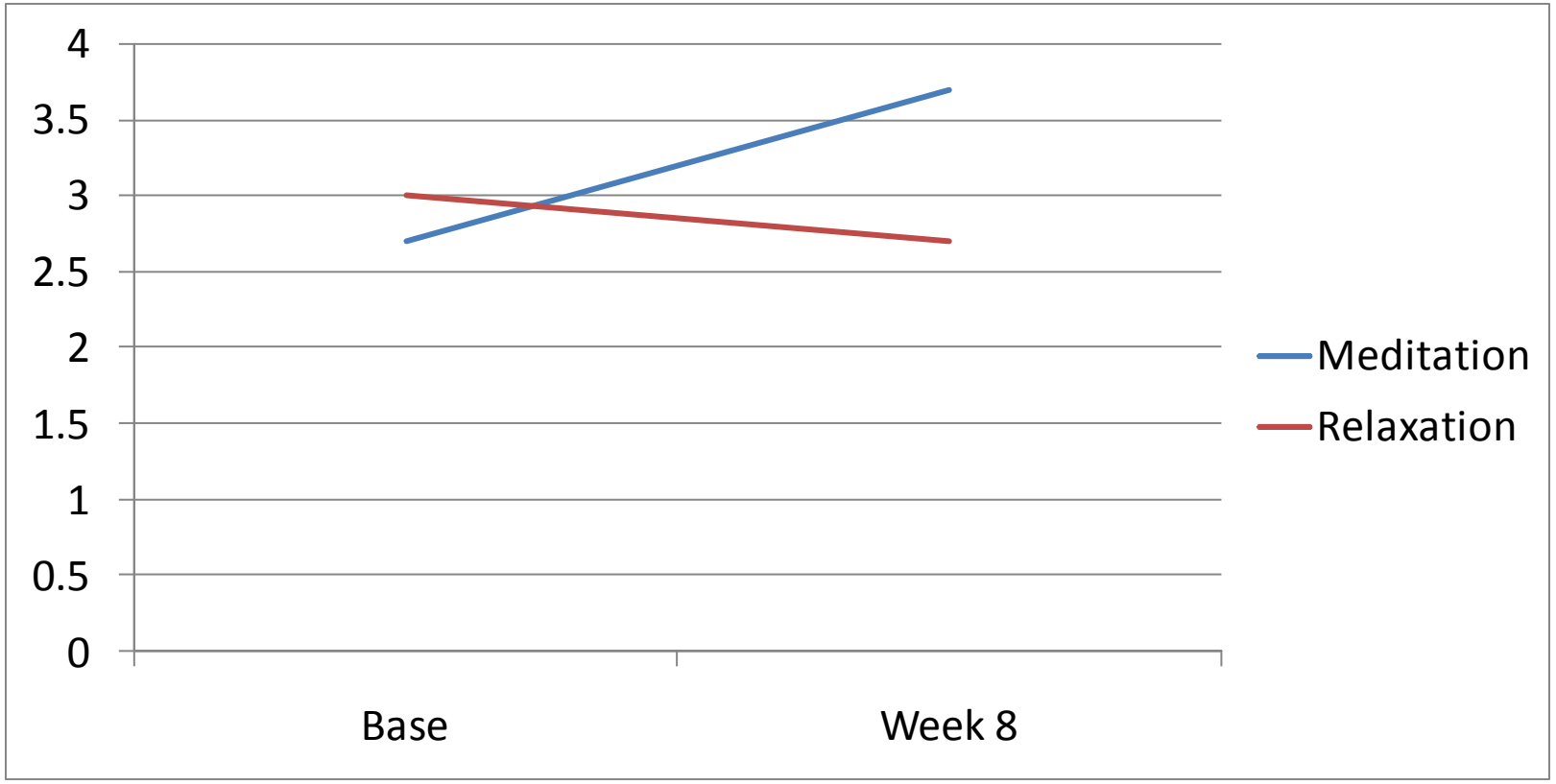
Cognition- Trail B seconds

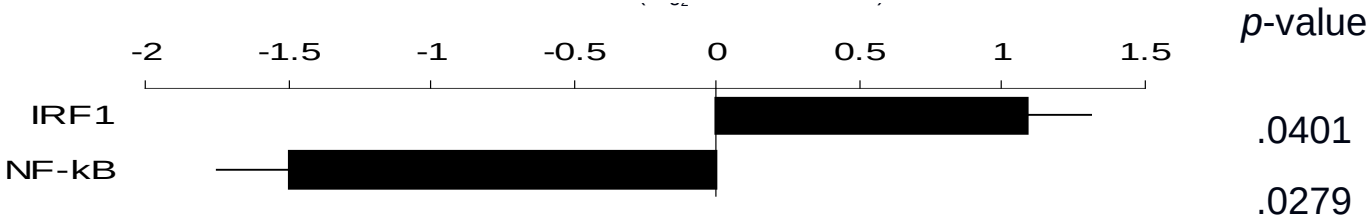


Mean Total Cells Under High Stimulation Expressing NFkB Pre and Post Study



Telomerase activity





p-value

.0401

.0279

FIGURE 1. Cross sectional view shown above displays the crosshair intersection within the right inferior frontal area. This region was the most significant and largest cluster demonstrating a decrease in the meditation group compared to the control group over time (t=4.74 with p=0.001,160 conti voxels at p<0.01)

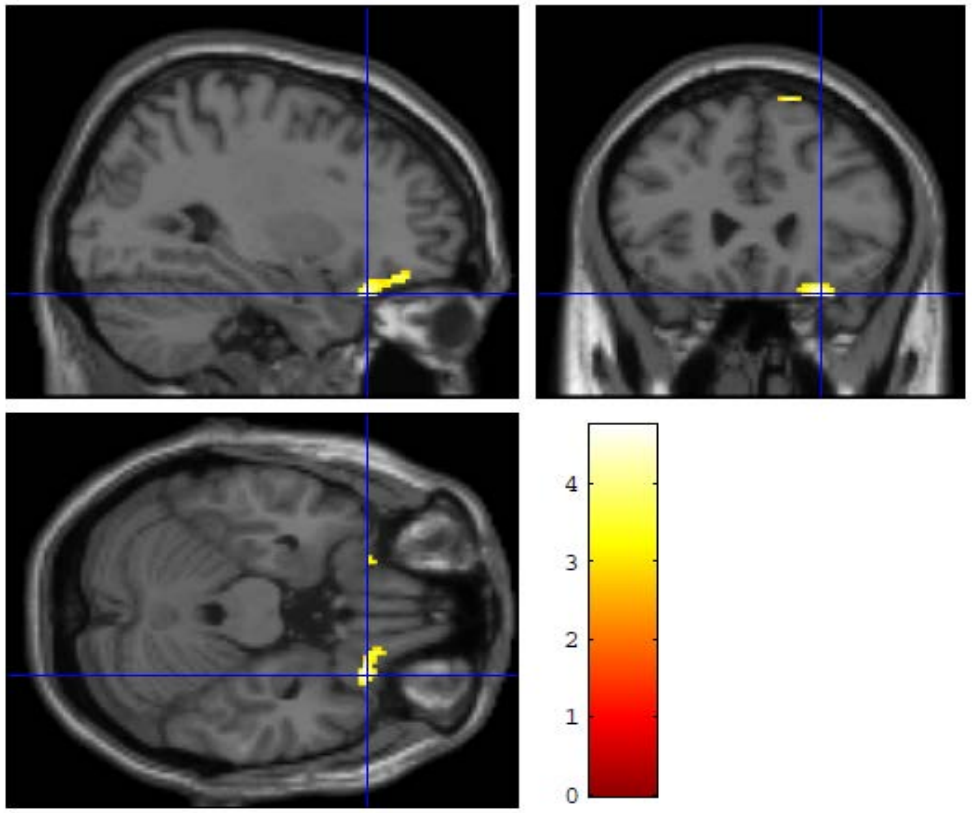
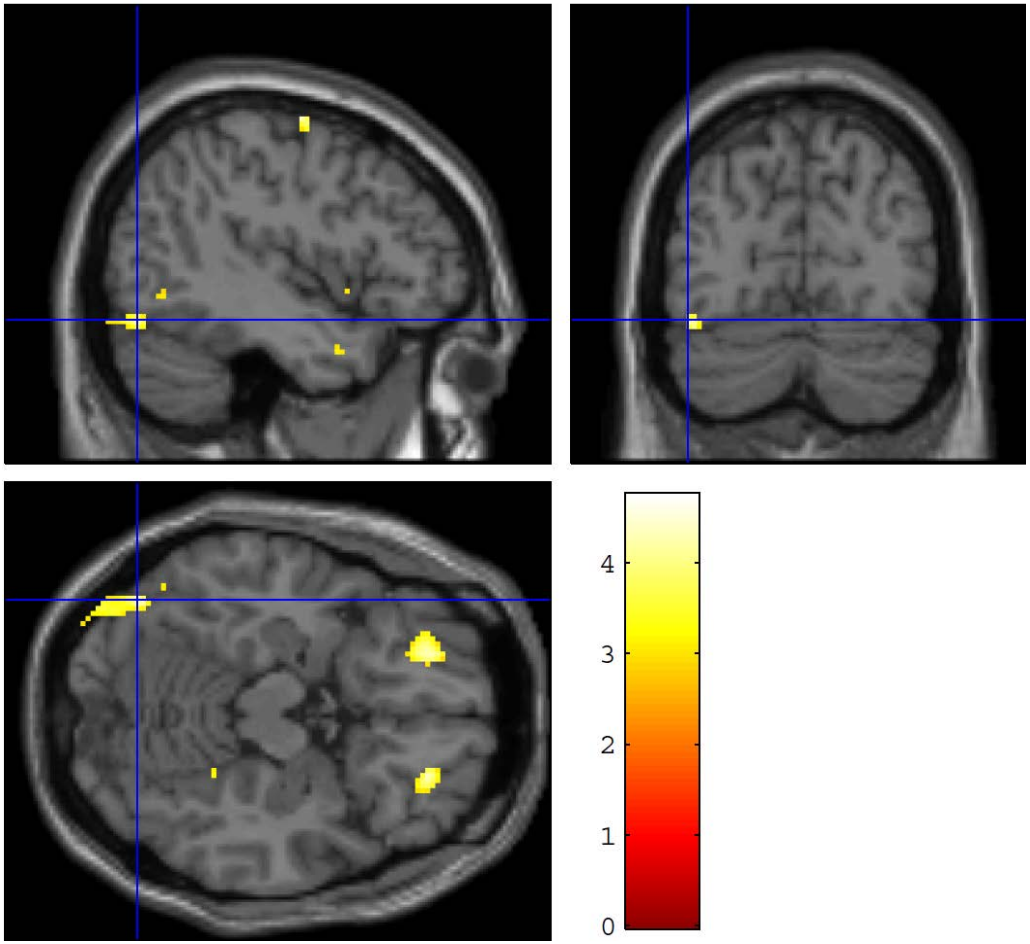
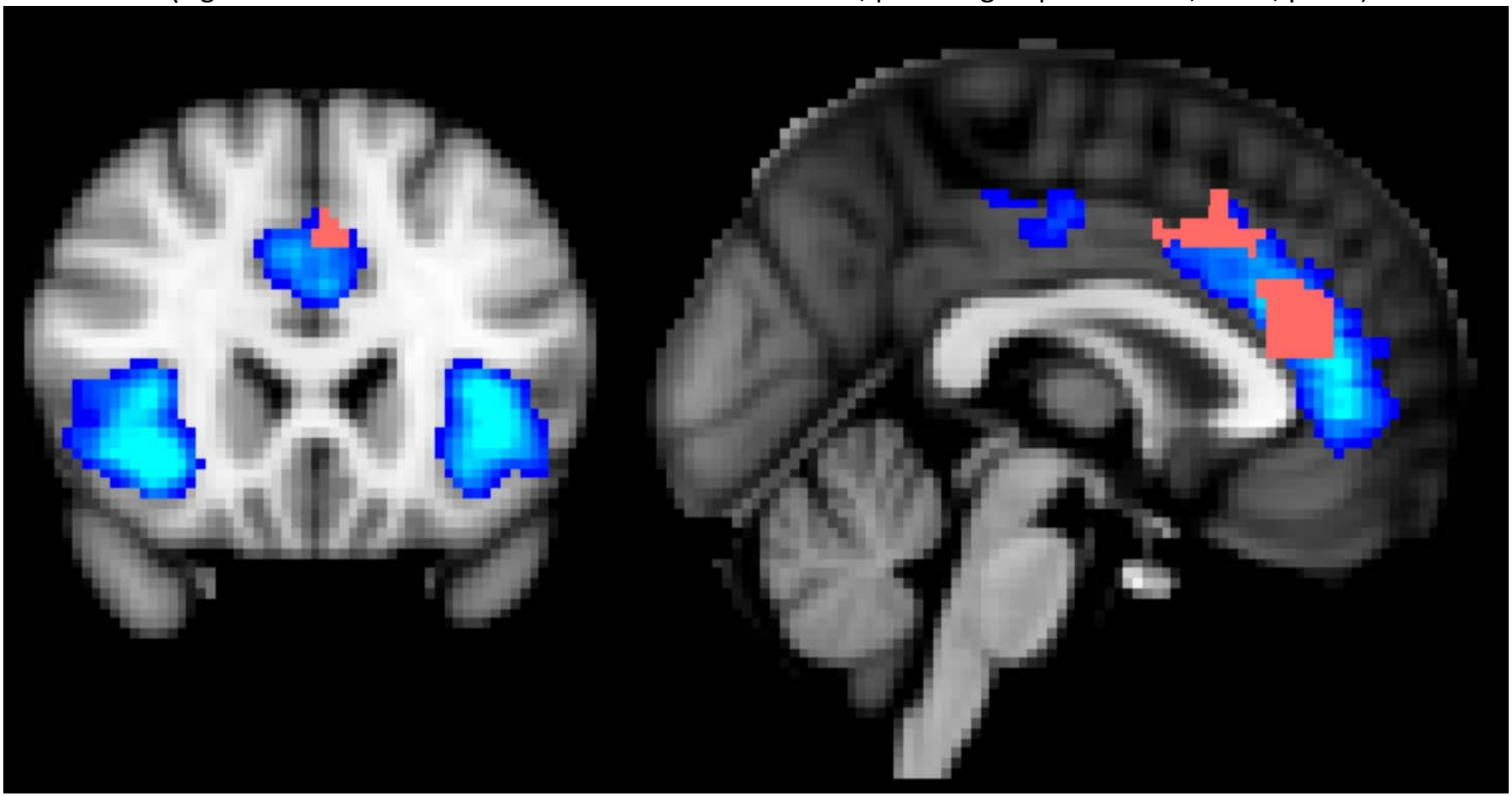


FIGURE 2. Cross sectional view shown above displays the crosshair intersection at (-44,-74,-16), within the left associative visual cortex. This region also decreased in the meditation group compared to the control group over time (t=4.15, p=0.002)



fMRI in meditators showed higher activity in a functional network including the anterior cingulate, fronto-orbital cortex and insula

(Light blue areas show the ACC-orbito-insular network, pink for group difference, z=1.7, p<.05)



Yoga for mild cognitive impairment

Eyre et al 2016; Yang et al 2016; Eyre et al 2017

UCLA

Outcome Measures

Cognitive:

- Verbal memory: HVLT; WMS-IV
- Visual-spatial: Rey-O
- Executive function: TMT-B, Stroop Word-Color, Animal Naming.

Mood and Other:

- GDS, AES, CD-RISC

Time:

- Baseline, 12 weeks, 24 weeks

Yoga

Kundalini Yoga (KY):

- 60 mins per week, 8 – 10 group.
  - Tuning In; Warm Up; Breath Techniques; Kirtan Kriya; Meditation; Rest.

PLUS

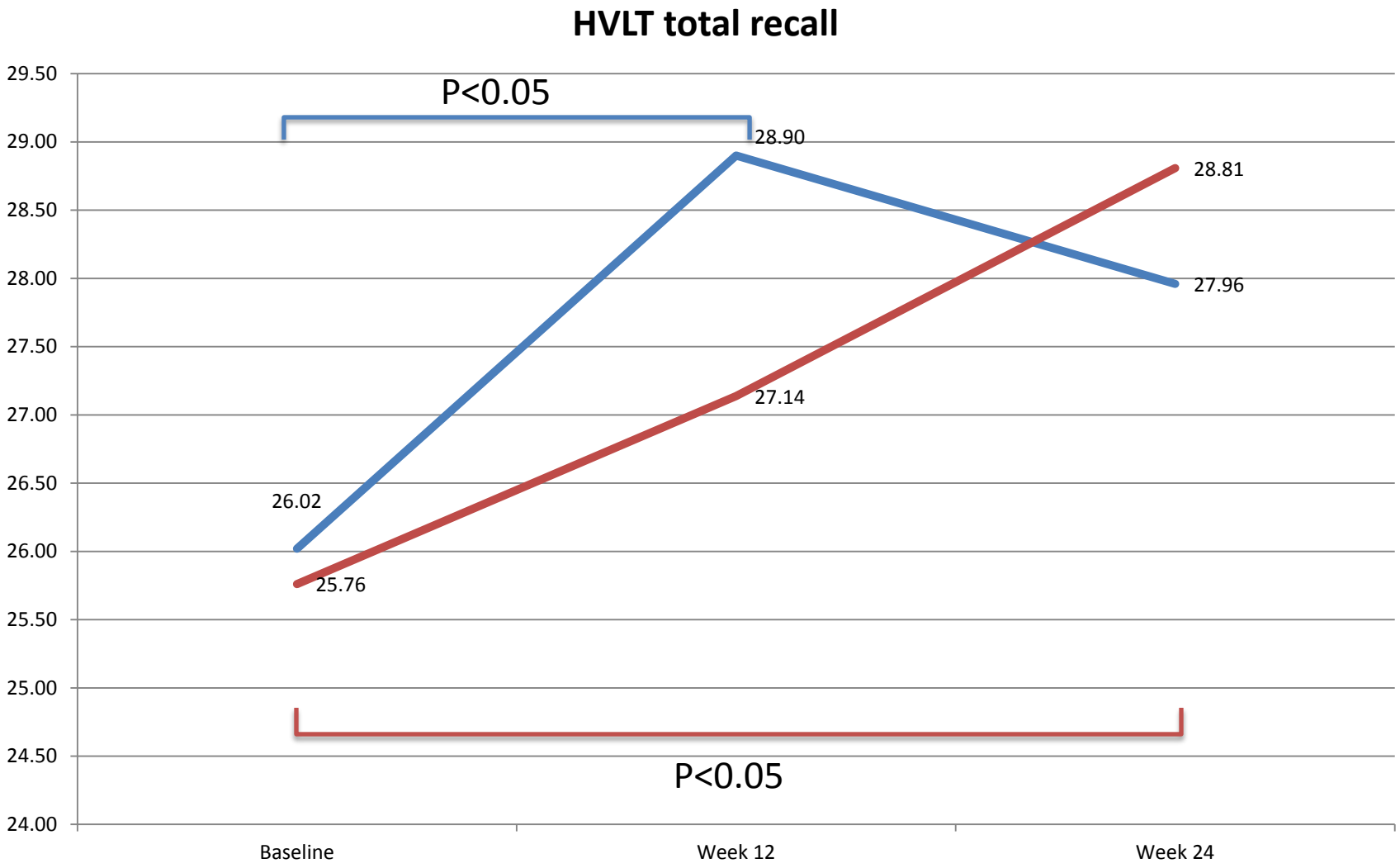
Kirtan Kriya:

- Daily homework, 12 mins.
  - Finger movements, mantras, deep breathing.

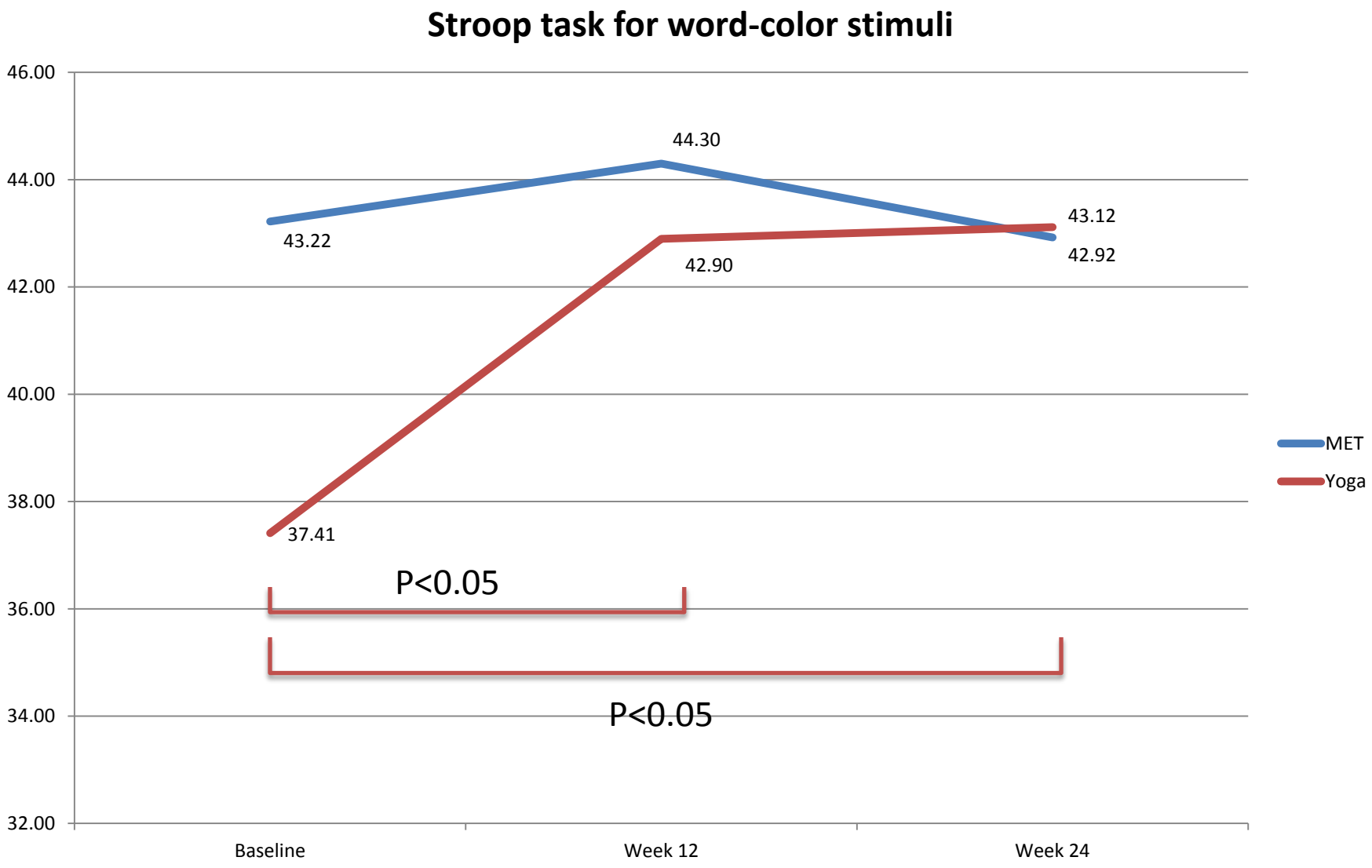
Memory Enhancement Training (MET)

- ‘Gold standard’.
- Developed by UCLA Longevity Center.
- Verbal and visual association strategies and practical strategies for memory.
- Weekly group session of 60 mins and daily homework (memory exercise for about 15 min a day).

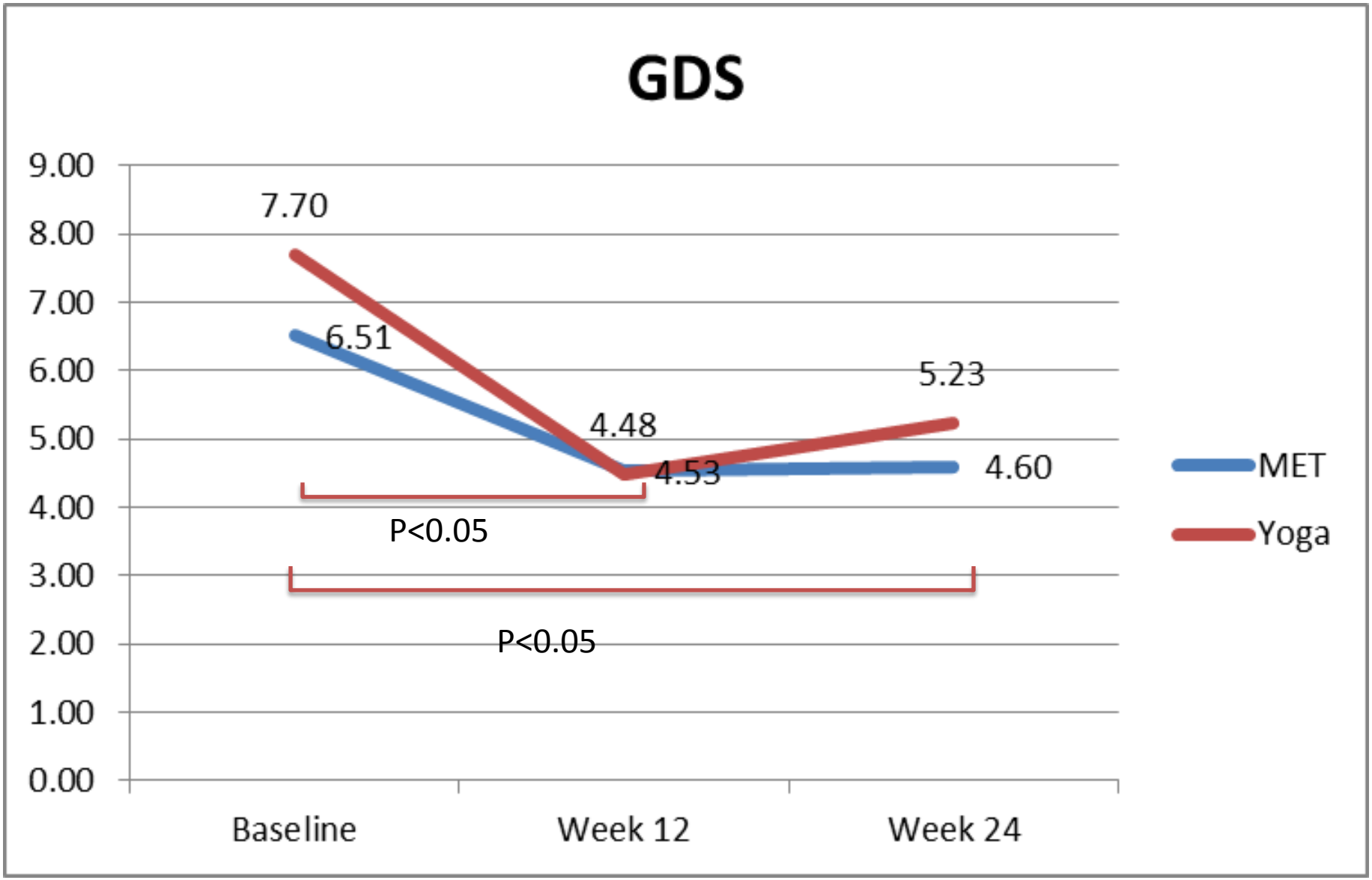
VERBAL MEMORY



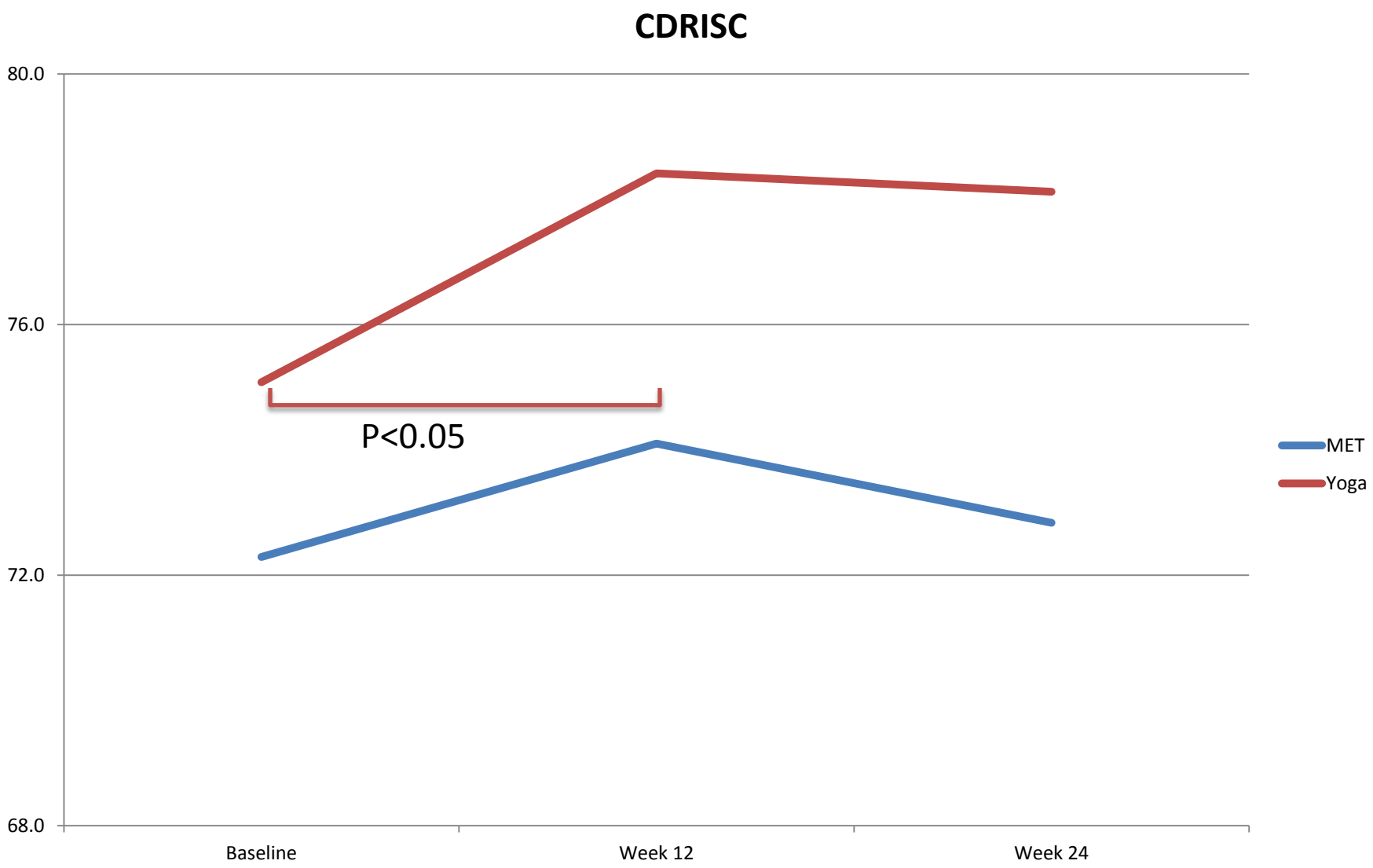
Executive function



Depressive Symptoms



Resilience



The New York Times

Well

PHYS ED

Yoga May Be Good for the Brain

By GRETCHEN REYNOLDS JUNE 1, 2016 5:31 AM 116

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National Opinion Business Tech World Olympics

Lifestyle Health & Wellbeing Food & Drink Fashion & Beauty

Yoga shown to boost the brain

5:30 PM Thursday May 12, 2016

THE DENVER POST

NEWS › HEALTH

If you want to improve memory, remember to doodle and do yoga

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HEALTH + BEHAVIOR
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NATION, WORLD + SOCIETY
ARTS + CULTURE

HEALTH + BEHAVIOR

To reduce pre-Alzheimer's cognitive impairment, get to the yoga mat

UCLA study finds yoga, meditation more effective than memory-boosting exercises

The Telegraph

calcutta, india

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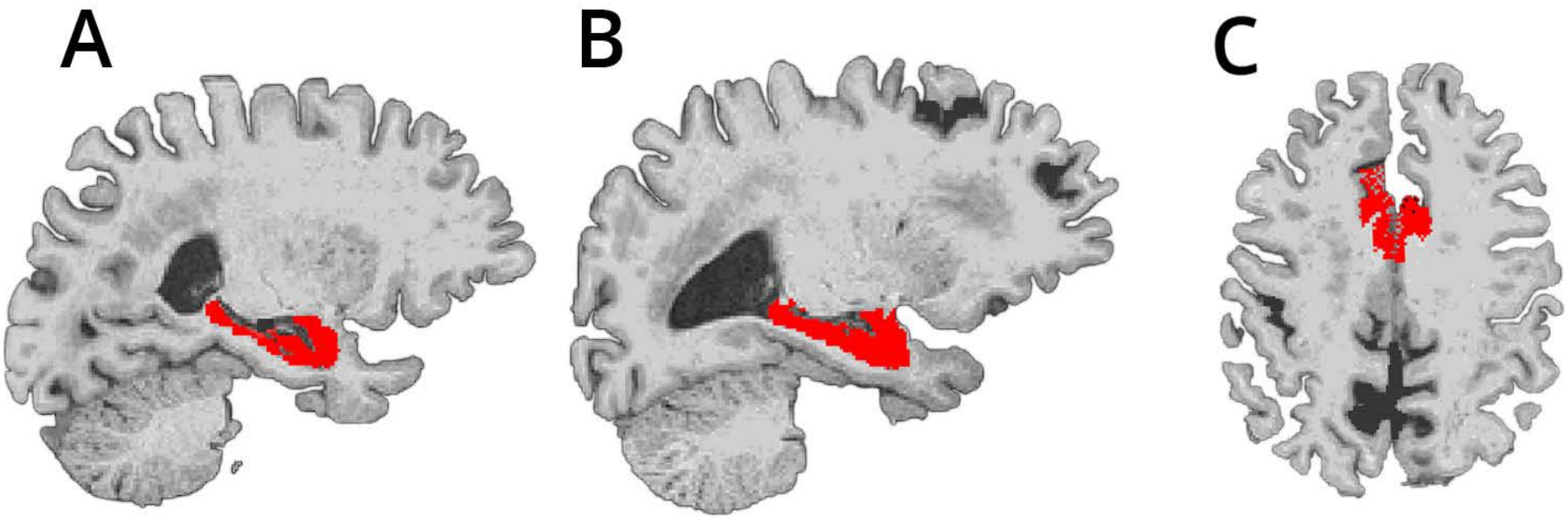
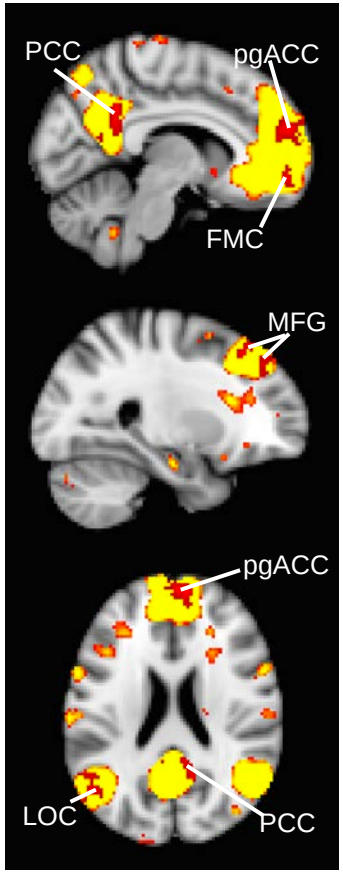
Yoga relief for Alzheimer's

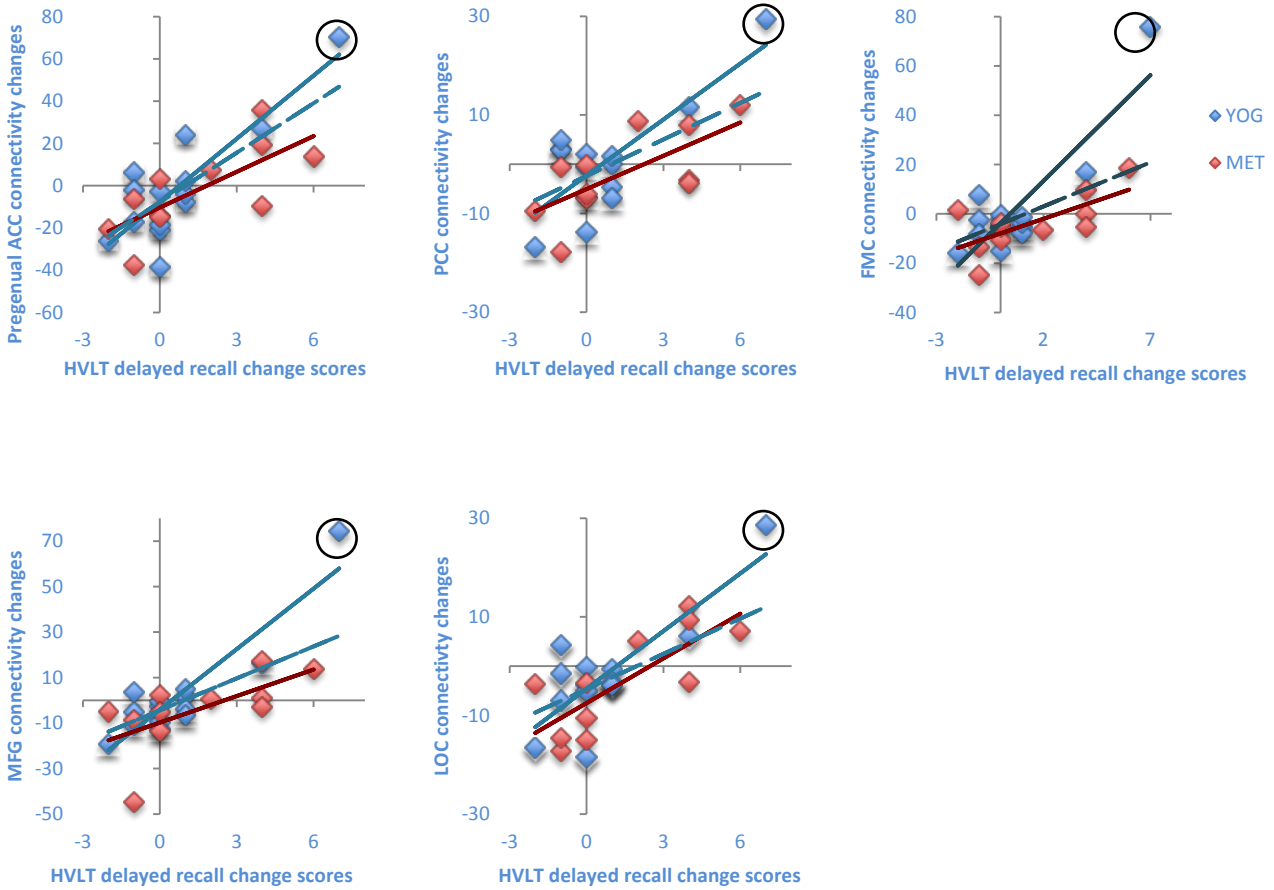


Example locations of bilateral hippocampus and dorsal ACC regions used in Freesurfer volume analyses. The right hippocampus (A), left hippocampus (B), and dorsal ACC (C) are displayed in red on a representative subject's brain image.

Changes in functional connectivity within the default mode network correlated with improved verbal memory performance.



B.

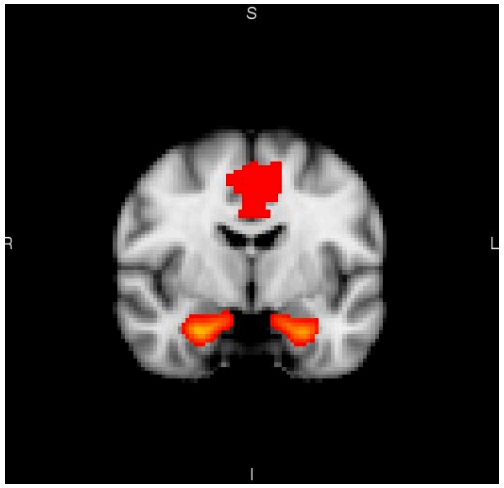


A. The default mode network (DMN) is displayed in yellow on a template brain in neurological convention. Regions that exhibited significant correlations between changes in DMN connectivity and changes in HVLT delayed recall are shown in red ($z > 2.3$, $p < 0.05$, corrected). All correlations were positive, and significant clusters included the pregenual anterior cingulate cortex (**ACC**), frontal medial cortex (**FMC**), posterior cingulate cortex (**PCC**), middle frontal gyrus (**MFG**), and lateral occipital cortex (**LOC**). B. Scatter plots indicate positive correlations in the clusters displayed in A in yoga (YOG, blue) and memory enhancement training (MET, red) groups. Trend lines are plotted for each group; dashed lines indicate trendlines without the outlier (marked with a black circle) for the yoga group.

Eyre et al 2016

MRI structural analysis

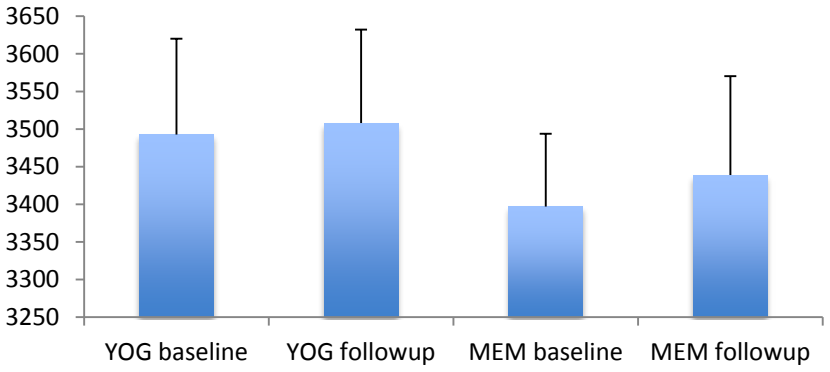
Dorsal ACC and bilateral hippocampus structure changes for yoga and MET groups



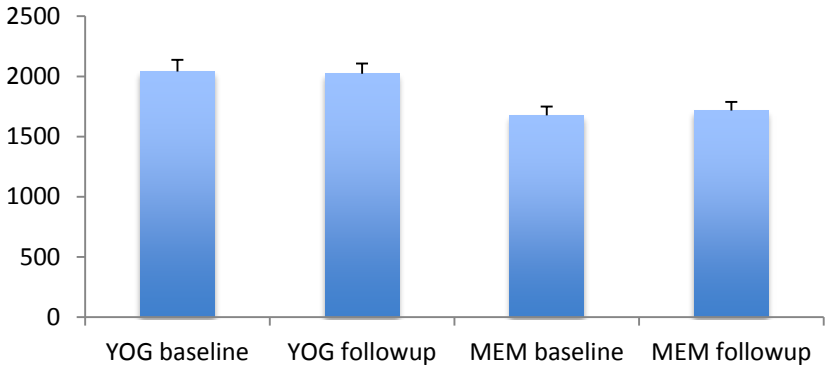
Dorsal ACC

Bilateral hippocampus

Bilateral hippocampus volume



Dorsal ACC volume

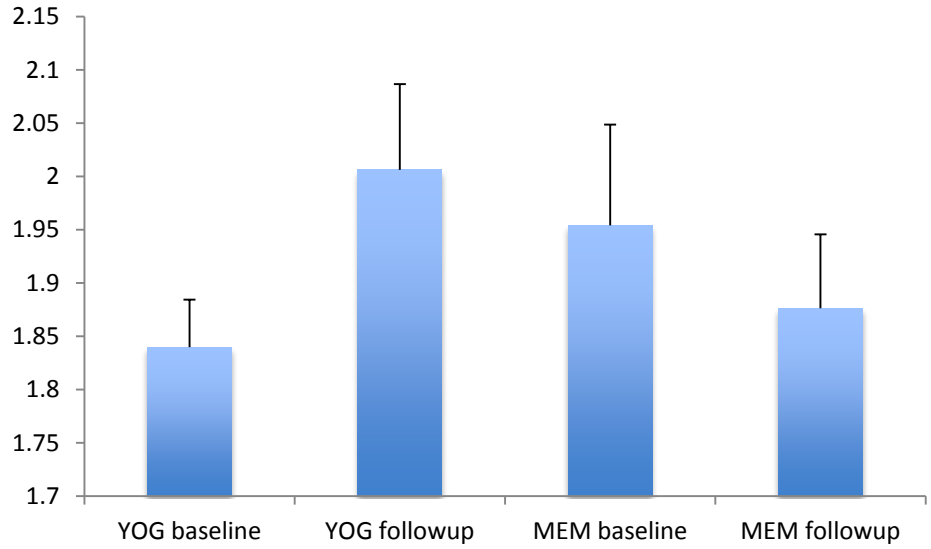


Yang et al 2016

Interaction between time*Group (hippo), F=4.53, P=0.0443,
Main group effect (dACC), F= 7.56, P=0.0114,
No other significant result was found.

MRS chemical analysis for dorsal ACC and bilateral hippocampus

Bilateral hippocampal Choline changes for yoga and MET groups



Yang et al 2016

Interaction between time*Group, F=4.62, P=0.0434
Choline = phosphocholine + glycerophosphocholine
No other significant result was found for Creatine, NAA and Glx.

Conclusion

First study to examine changes in cognition with a yoga and MET in MCI.

Cognitive outcomes:

- Comparable changes for both yoga and MET in memory performance.
- Yoga>MET improved in executive function test performance.
- Yoga>MET continued to improve at 6 month

Mood outcomes:

- Yoga>MET had a broader impact on mood and resilience.

Brain outcomes:

- Increased connectivity within DMN and the language network in association with improved verbal memory performance for both Yoga and MET groups.
- MET increased hippocampal volume, associated with baseline language scores
- Yoga increased and MET decreased hippocampal Choline concentration

Promising results for future studies of yoga vs. pharmacological approaches for prevention of cognitive decline

Acceptability is improved with the use of non-pharmacological and spiritual interventions