

Meditation and Optimizing Mental Health

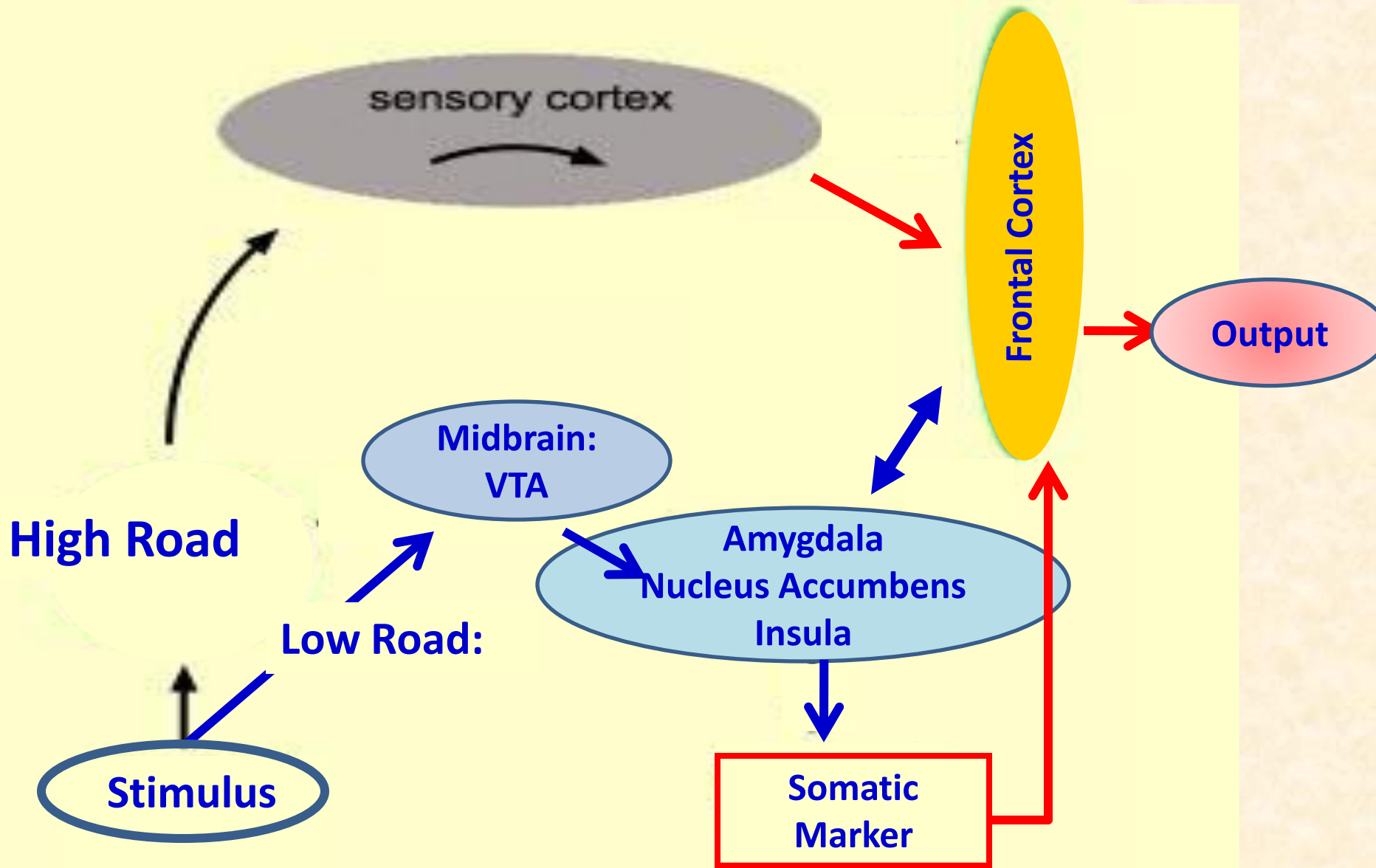


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Maharishi University of Management
Fairfield, Iowa USA

Wholeness

How we perceive a situation determines how we respond (McEwen). Perception is the coming together of knower and known. By changing self-knowledge we change our perception and so our response in any situation.

Low Road and High Road



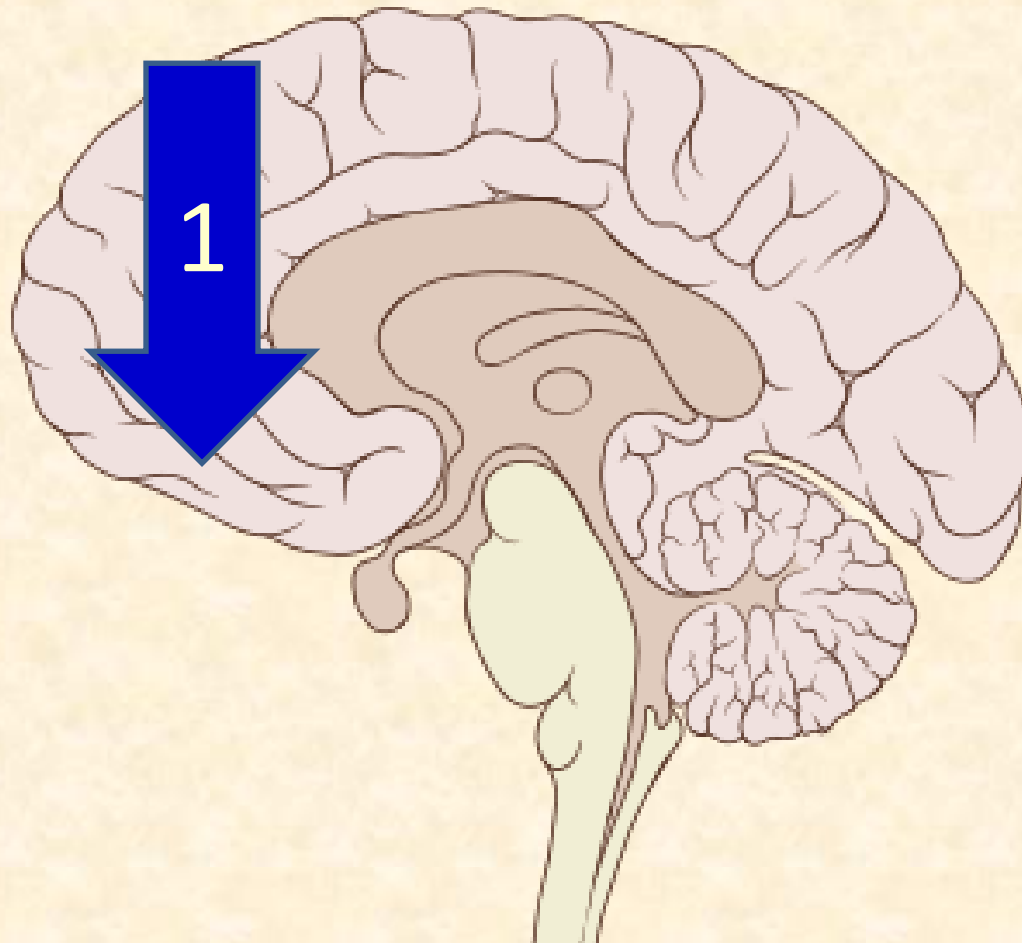
Intergroup Competition: seen in soccer and baseball

- **Failure of a person on your team;**
 - Anterior insula activated— helping behavior and greater empathy
- **Failure of a person on the other team;**
 - Nucleus accumbens—part of pleasure circuit.

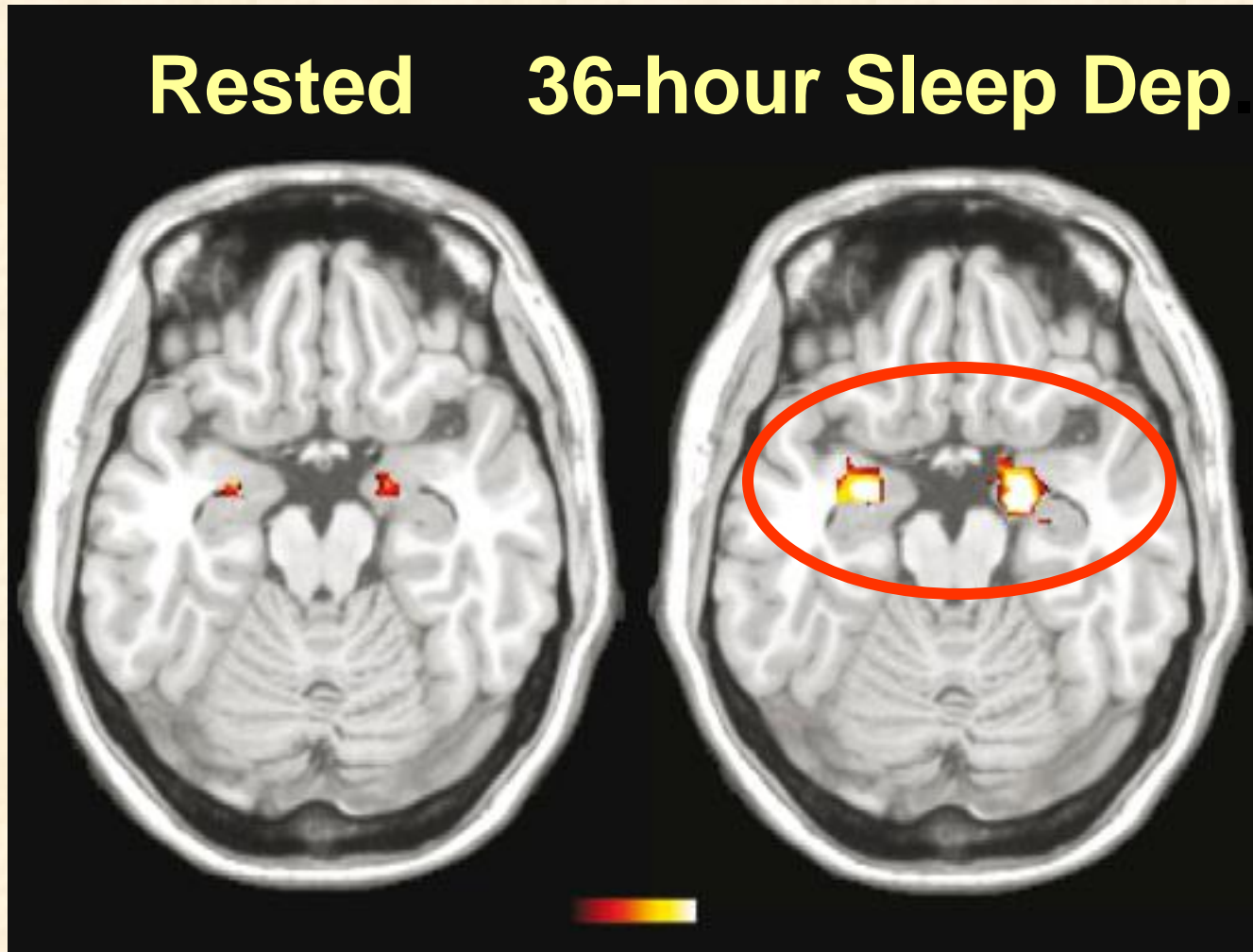
Racial Profiling

- **Policemen will most often see a youth of color pull a gun from their coat; and a white youth pull an ipod from their coat.**

**Frontal areas are offline when
you are tired and when you
are under stress**



Fatigue: Everything is More Intense.

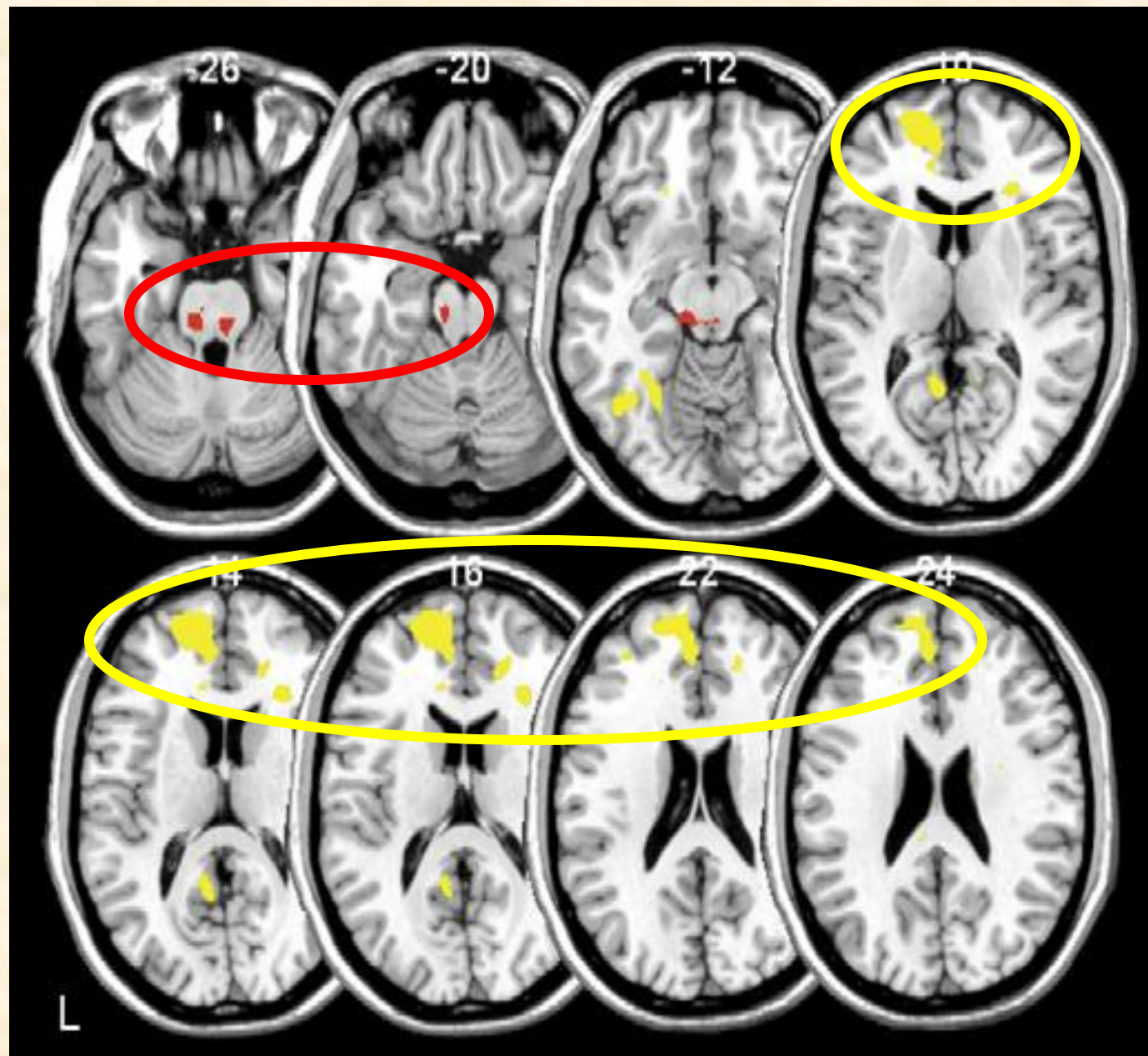


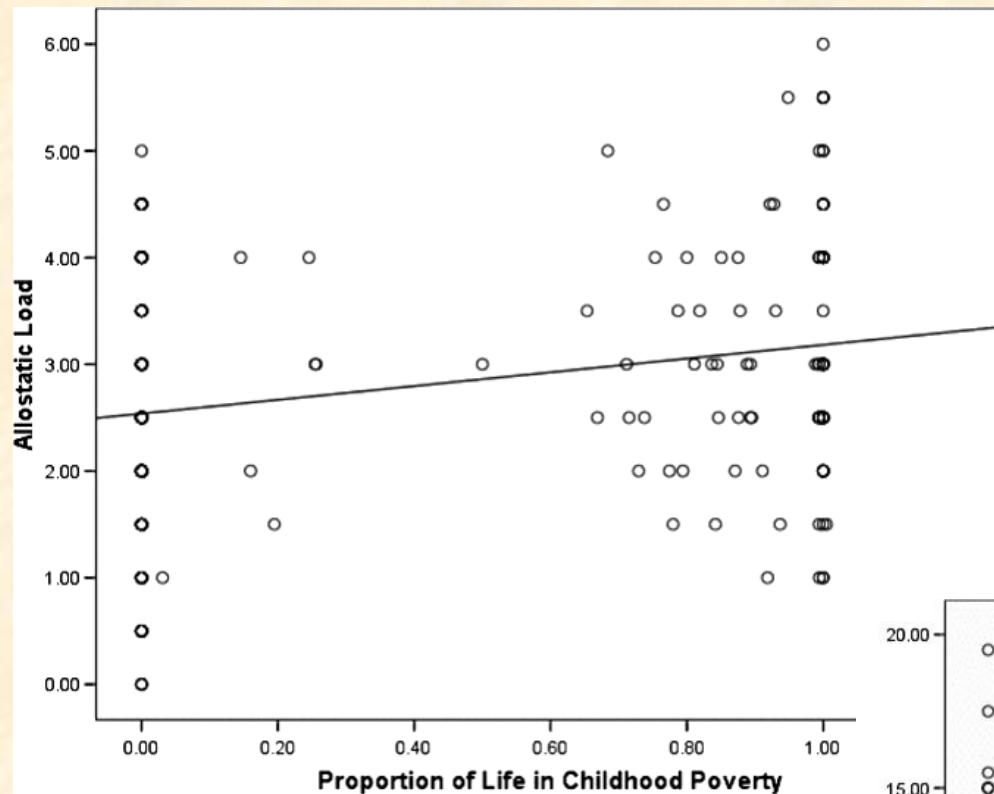
**Amygdala
60% more
active
and 3
times
greater
area
when
tired.**

Yoo et al. (2007) The human emotional brain without sleep -- a prefrontal amygdale disconnect. *Current Biology*, Vol. 17, No. 20, R877-R878.

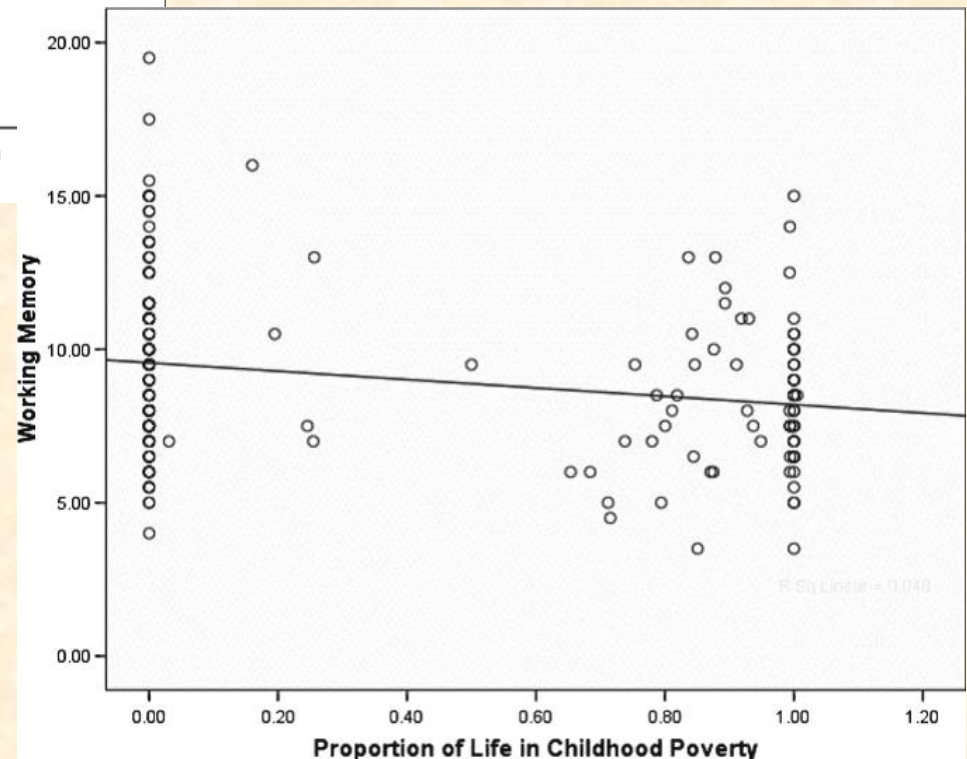
**Red =
no
sleep;**

**Yellow =
rested**





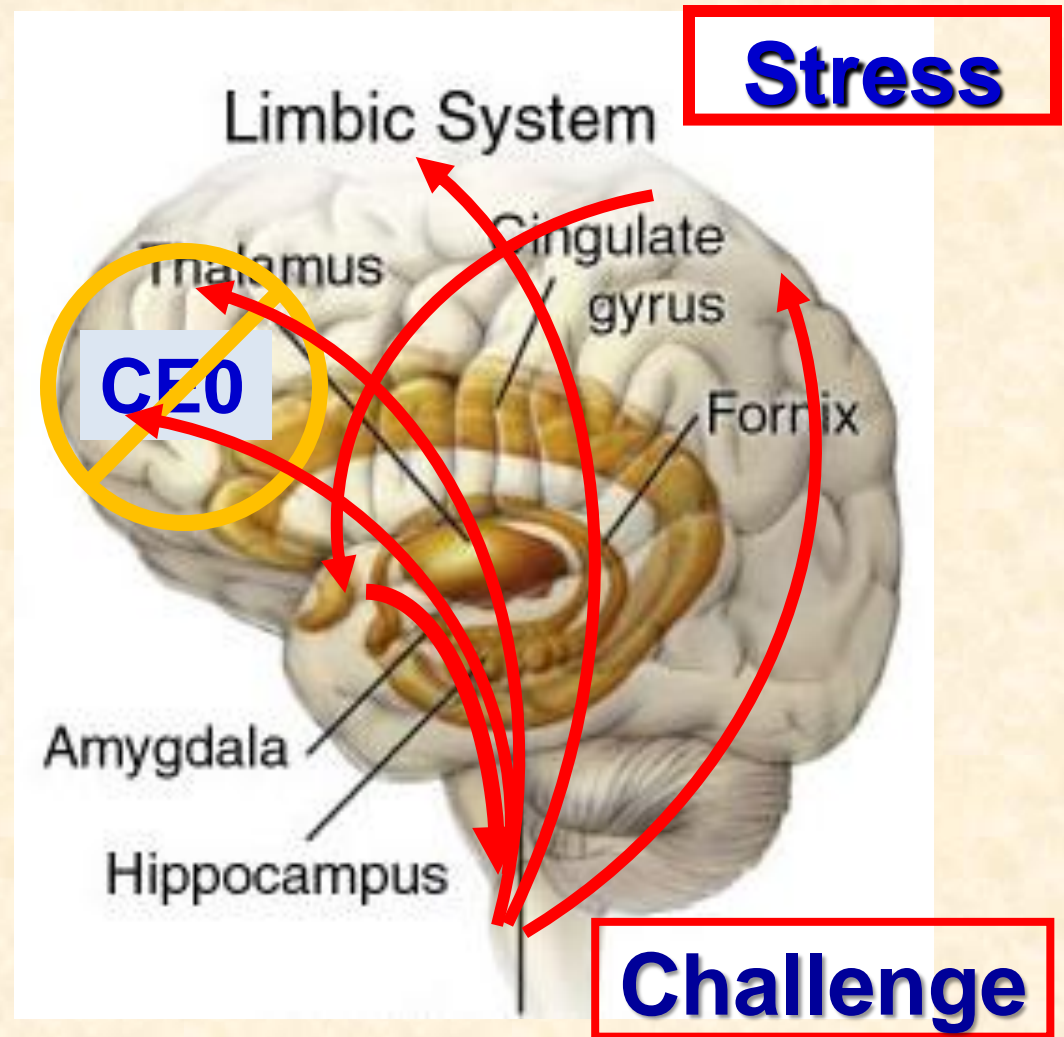
**Stress reduces
size of frontal
(executive center)
and hippocampal
(memory) volume.**



**Evans & Schamberg (2009)
Proceedings of the National
Academy of
Sciences, 106(16) 6545–
6549**

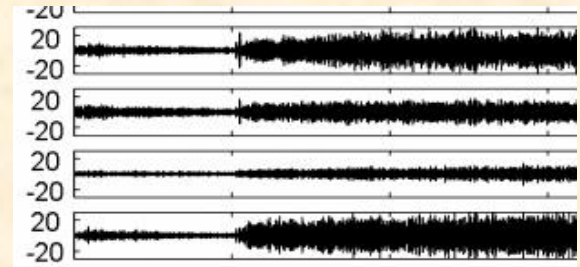
Challenge versus Stress

1. Challenge
2. Stress



Focused Attention

....voluntary focusing of attention on a chosen object (Lutz)

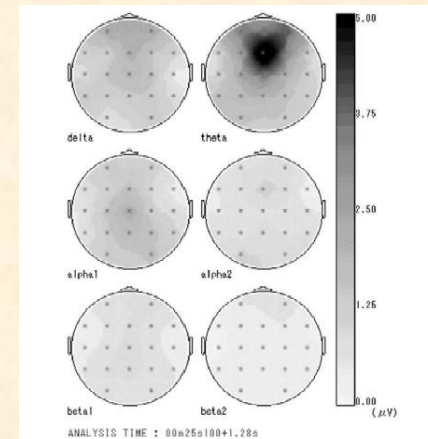


Gamma (20-50 Hz)

Open Monitoring

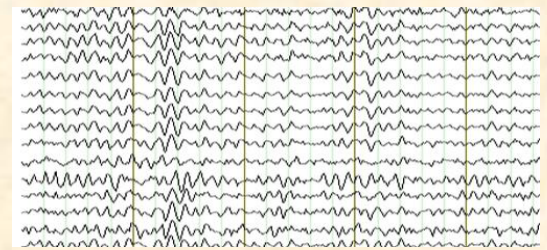
...nonreactive monitoring of the content of experience from moment to moment (Lutz)

Theta2
(6 – 8.0)



Automatic Self-Transcending

...transcend the steps of the meditation practice (Travis and Shear)

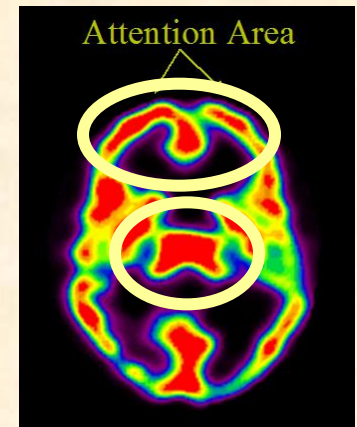


Alpha1 (8.0-10 Hz)

Travis and Shear, 2010, Consciousness and Cognition, 19:1110-1119.

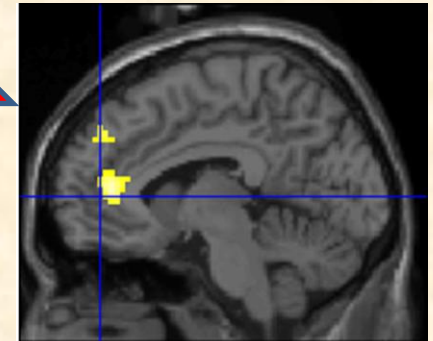
Focused Attention

- Zen
- Compassion Meditation
- Qigong
- Diamond Way Buddhism
- Vipassana



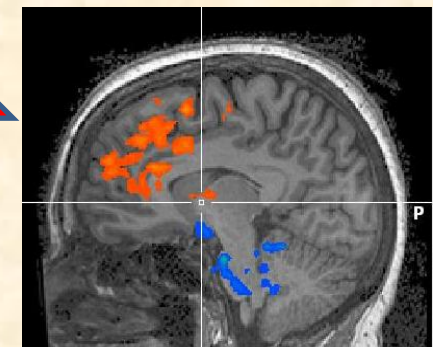
Open Monitoring

- Zazen
- Mindfulness
- Saharaj
- Qigong
- Kriya Yoga



Automatic Self-Transcending

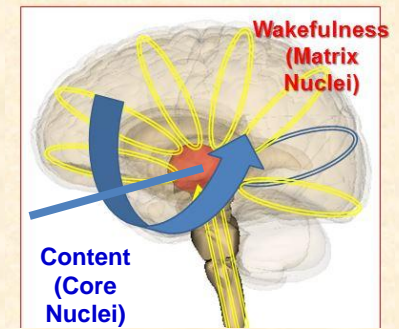
- Transcendental Meditation
- Two Case studies:
Expert Qigong and Mindfulness



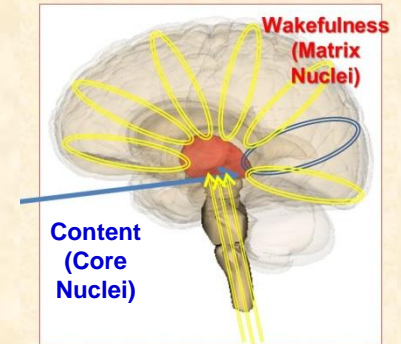
Focused Attention

Meditations in both FA and OM categories:

- Are “**constructed**” states created through deployment of specific attentional strategies

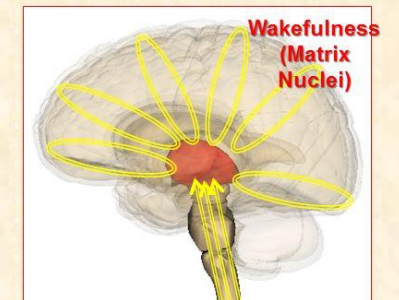


Open Monitoring

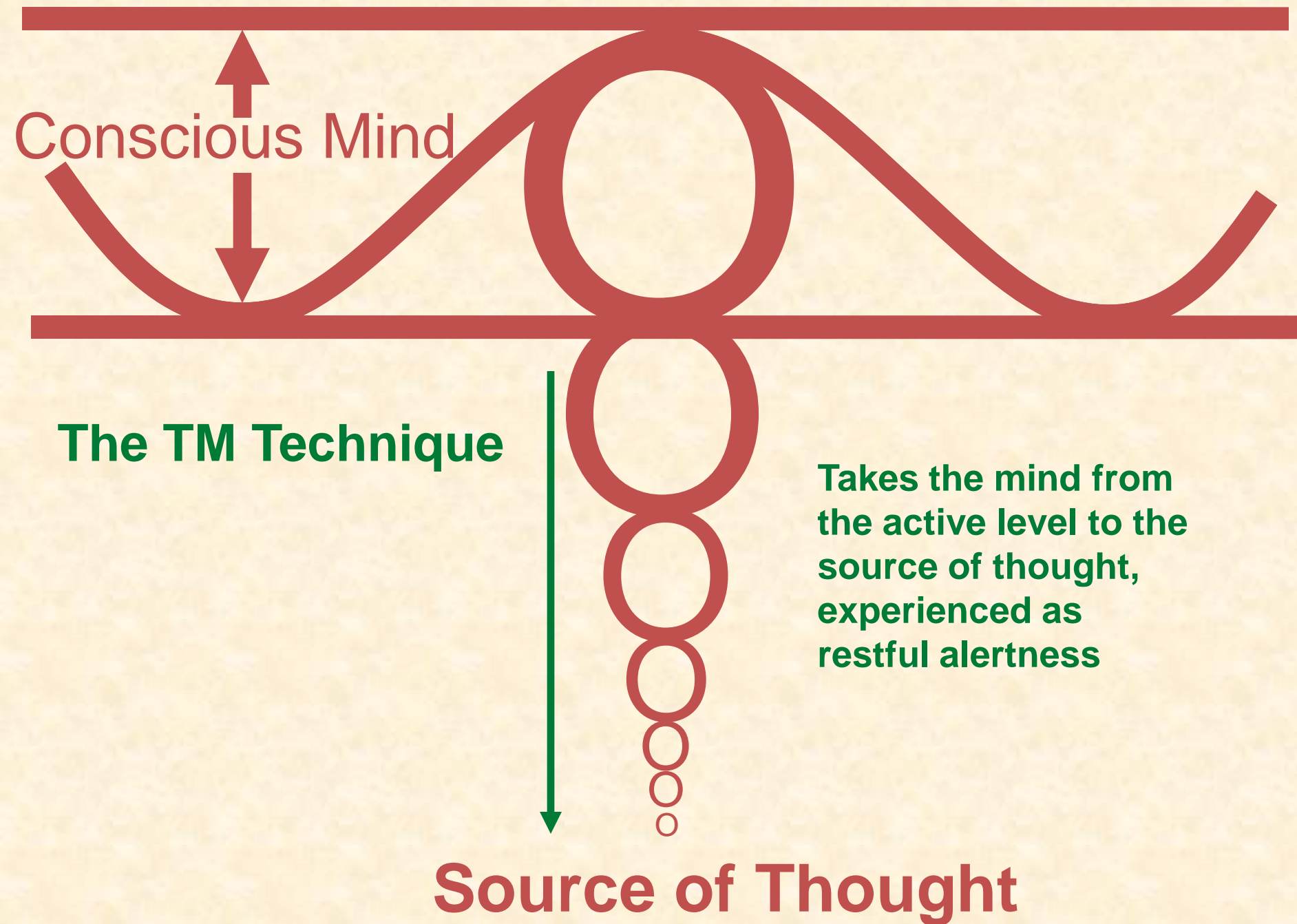


Meditations in AST:

- Are “**unconstructed**” and do not involve intentional effort; based on reflexive awareness.



Travis and Shear, 2010, *Consciousness and Cognition*, 19:1110-1119.



Front

Middle

Back

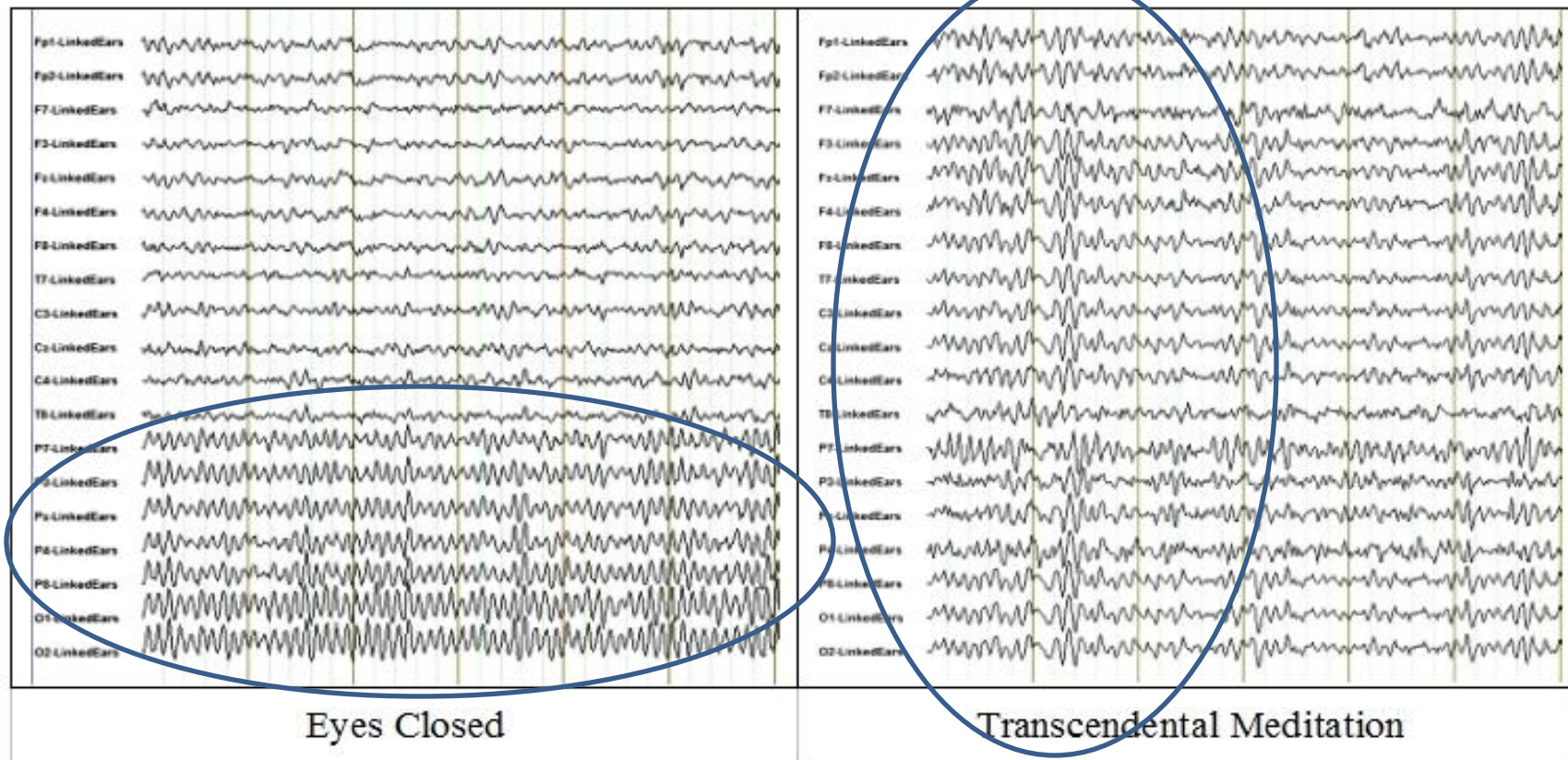


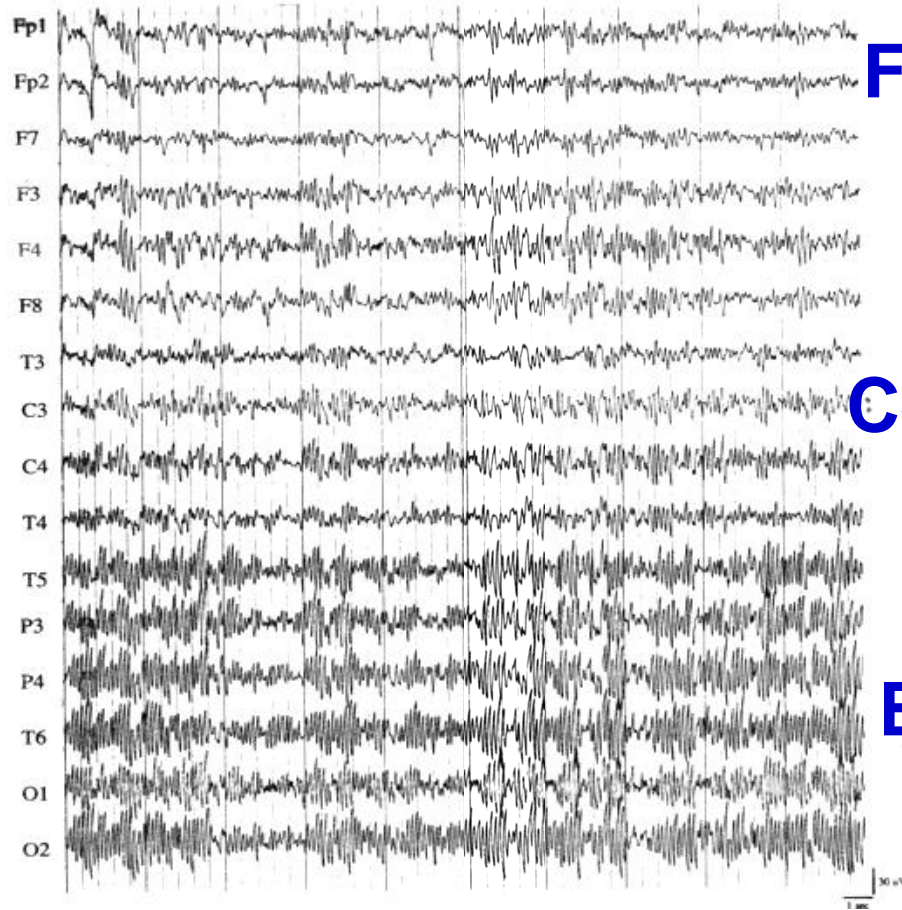
Figure 1: Raw EEG Tracings during Eyes Closed Rest (left) and Transcendental Meditation practice (right). These figures present 18 tracings over 6 seconds. The top tracings are from frontal sensors; the middle tracings are from central sensors; the bottom tracings are from parietal and occipital sensors. Note the high-density alpha activity in posterior leads during eyes closed rest, and the global alpha bursts across all brain areas | during Transcendental Meditation practice.

Travis et al, 2009

Let's See EEG Patterns during TM in Real Time...

- **Notice how quickly brain patterns change during TM practice.**
- **Notice how the coherence is uniformly higher during TM practice.**

Four Months TM Practice

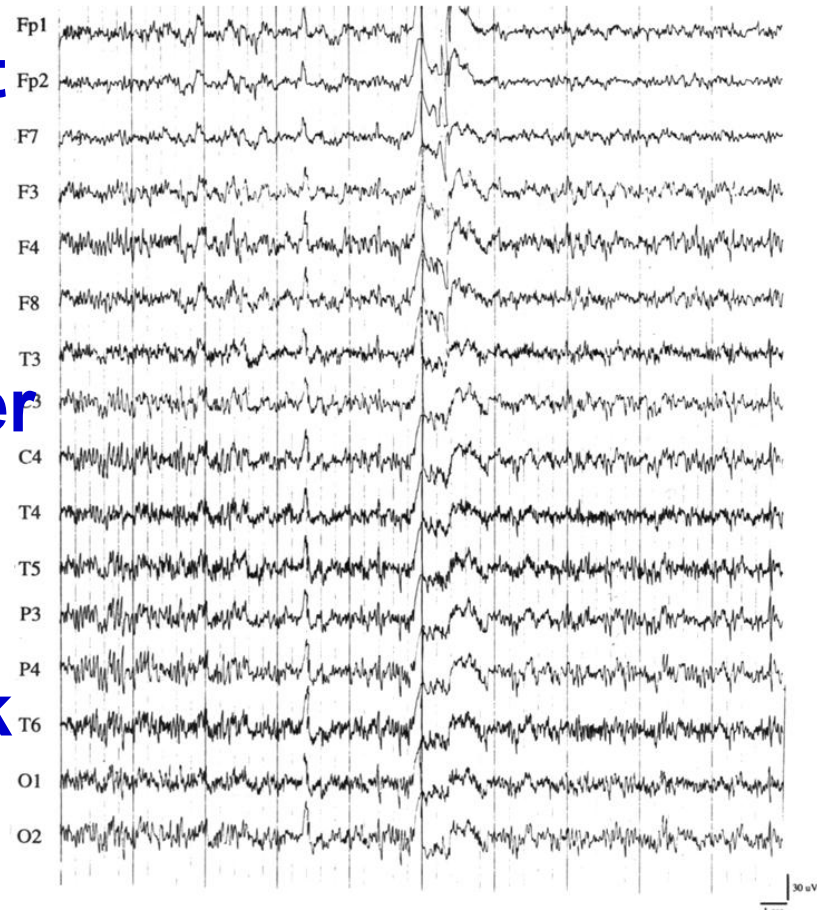


Front

Center

Back

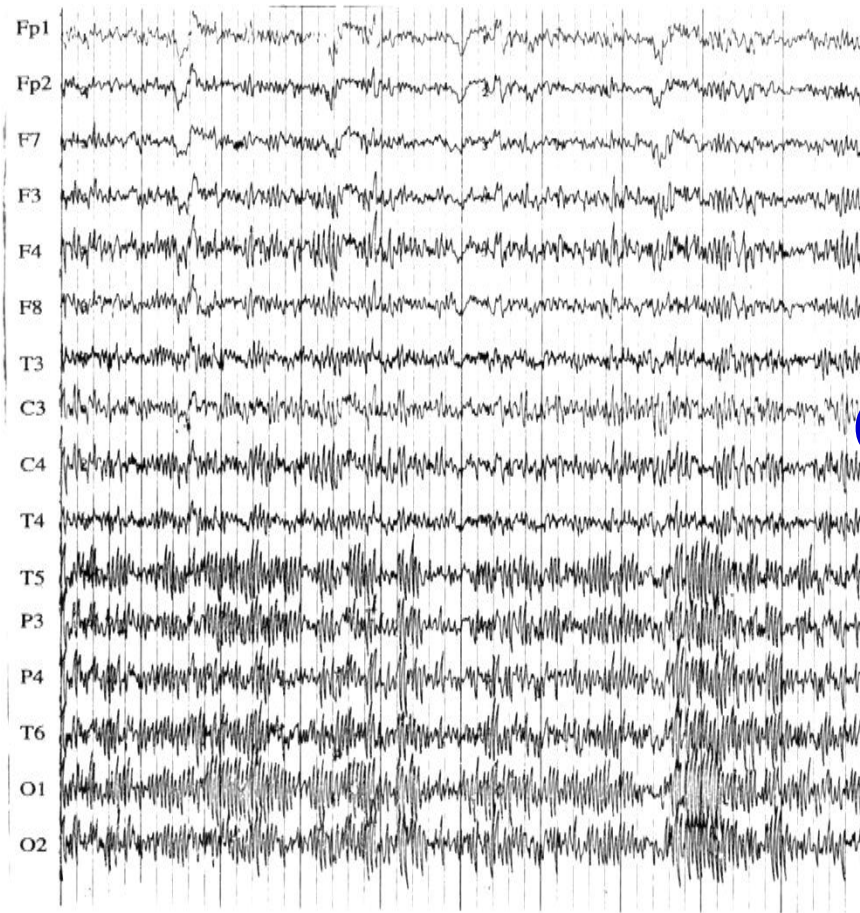
TM



Eyes Open

Travis, 1991

Eight Years TM Practice

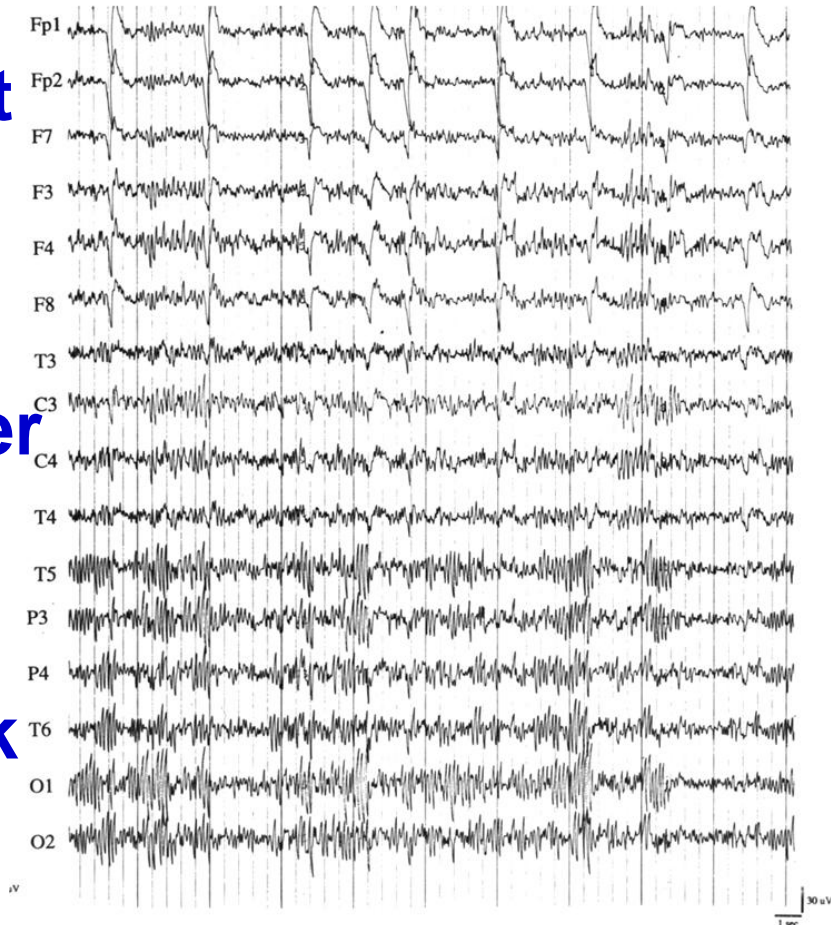


Front

Center

Back

TM



Eyes Open

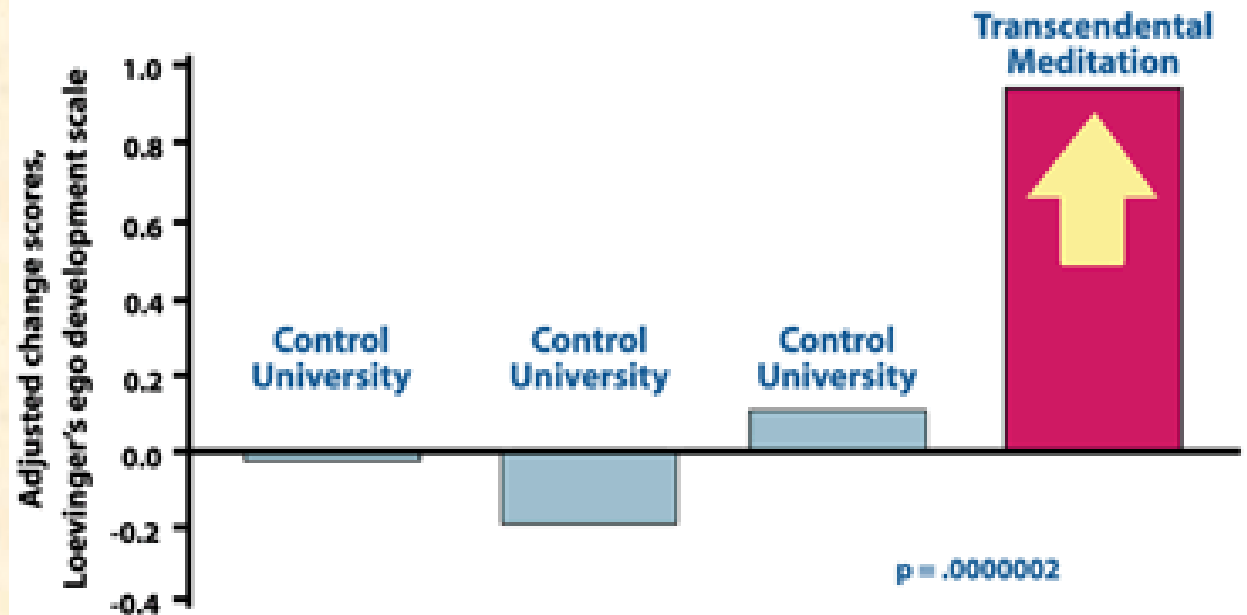
Travis, 1991

M.U.M. Alumni

38% at or above Autonomous stage 10
years after graduation.
(2–3% general
population)

Increased Self-Development

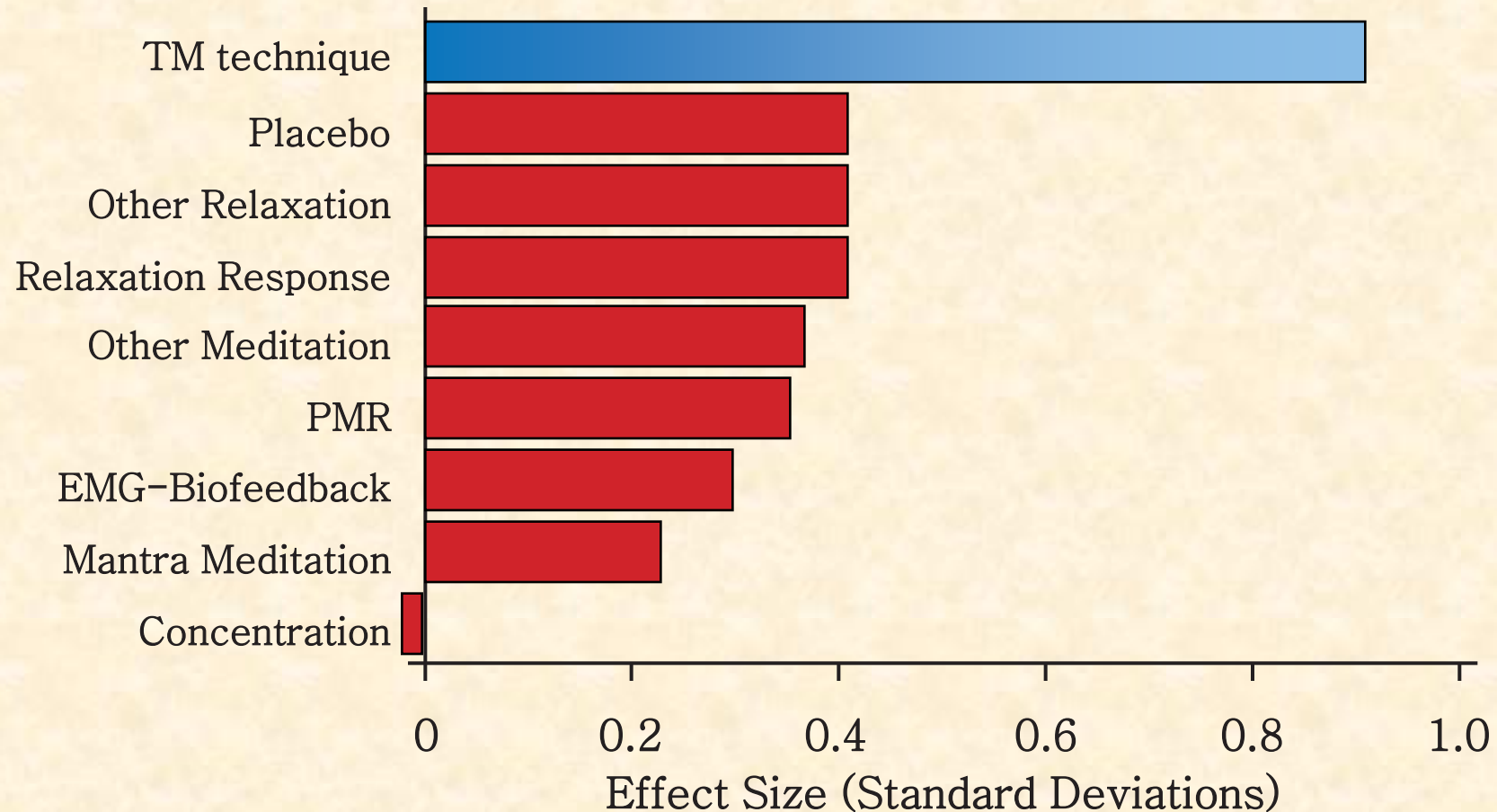
THROUGH THE TRANSCENDENTAL MEDITATION PROGRAM



Chandler, et al, 2003

Effectiveness in Reducing Trait Anxiety

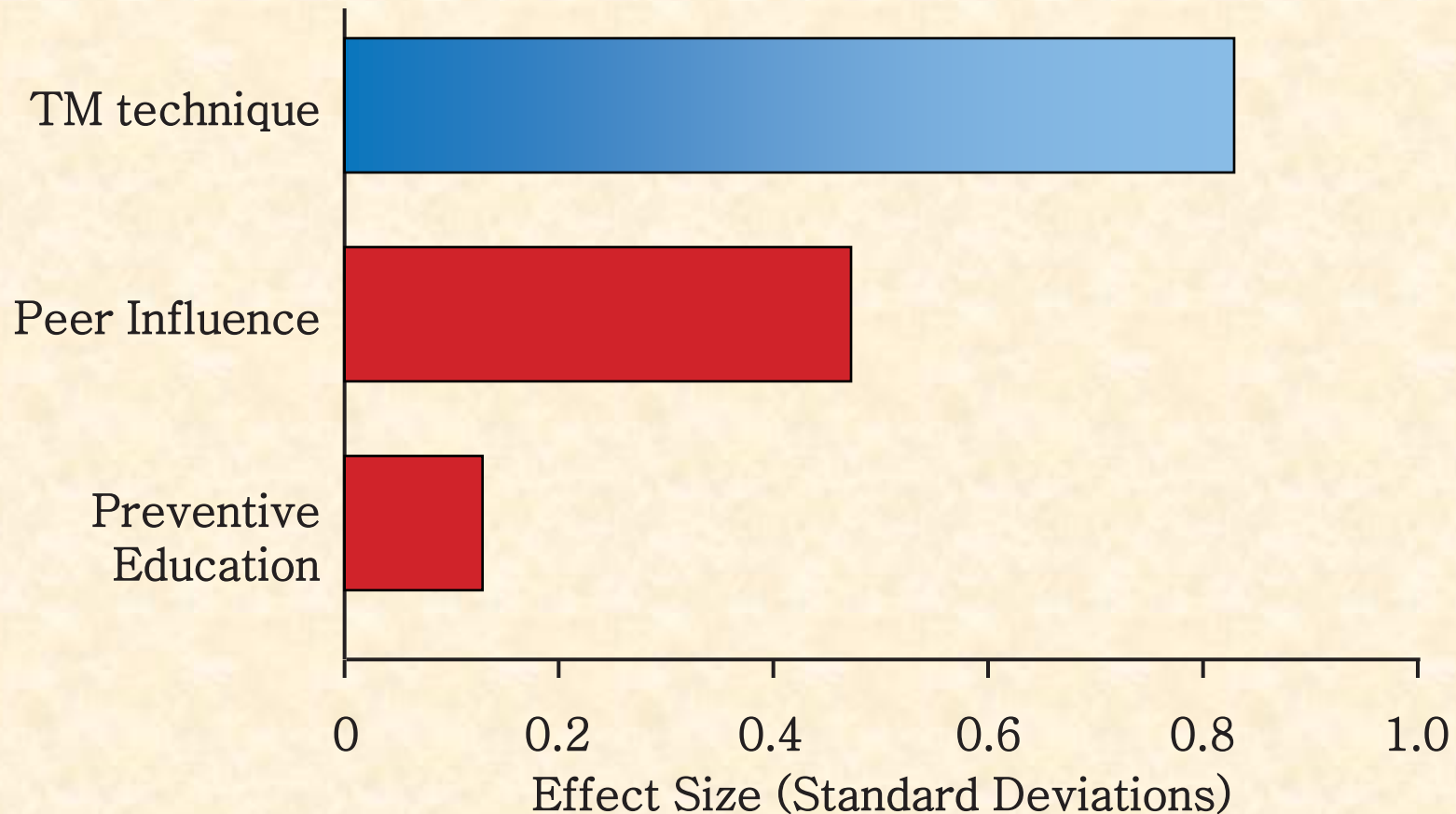
Meta-analysis of 146 studies



Eppley, K., Abrams, A., Shear, J. (1989). Differential effects of relaxation techniques on trait anxiety: a meta-analysis. *Journal of Clinical Psychology*, 45 (6): 957–974.

Effectiveness in Decreasing Drug Abuse

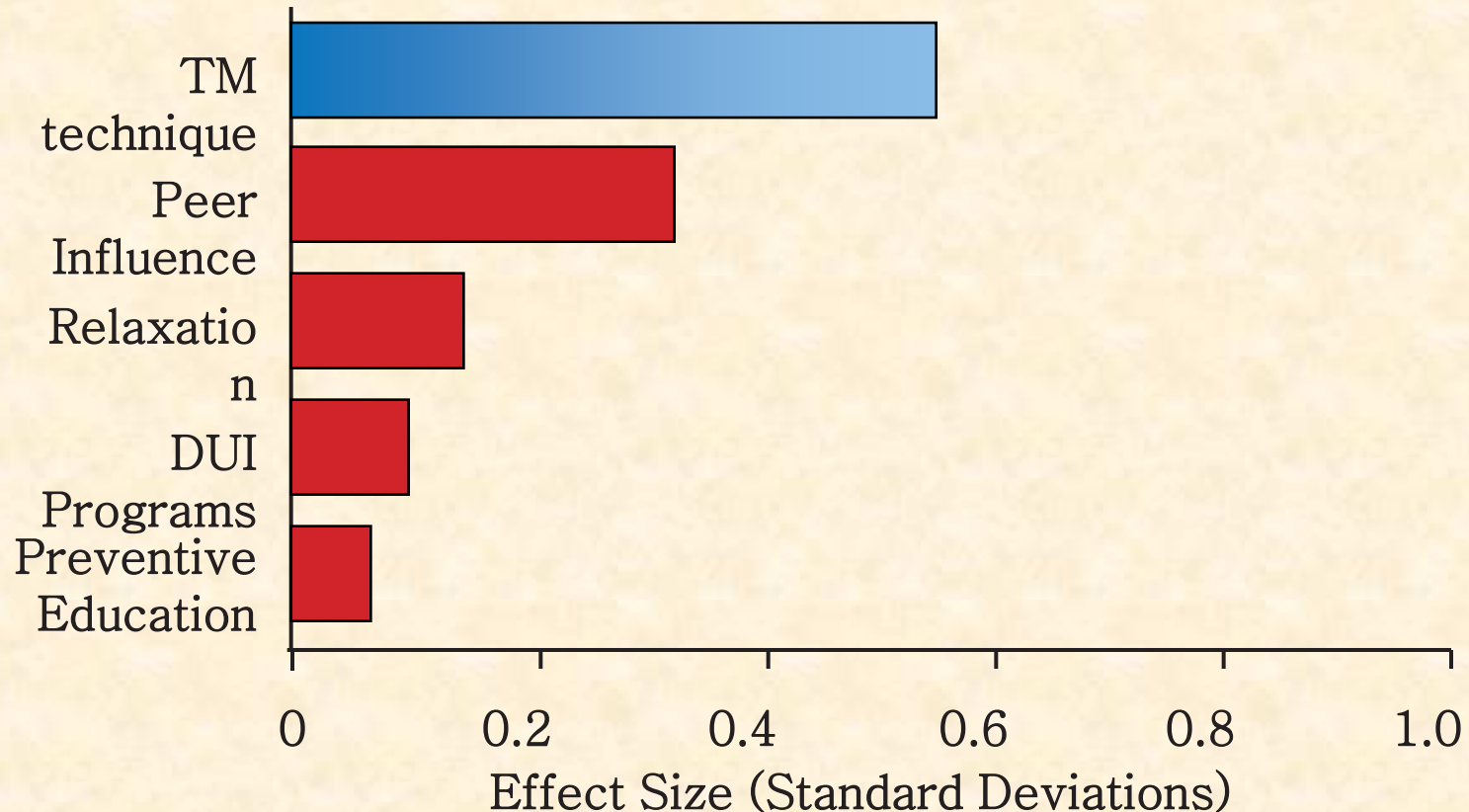
Meta-analysis of 70 studies



Alexander, C.N., Robinson, P., & Rainforth, M. (1994). Treating and preventing alcohol, nicotine, and drug abuse through Transcendental Meditation: A review and statistical meta-analysis. *Alcoholism Treatment Quarterly*, 11, 13–88.

Effectiveness in Decreasing Alcohol Use

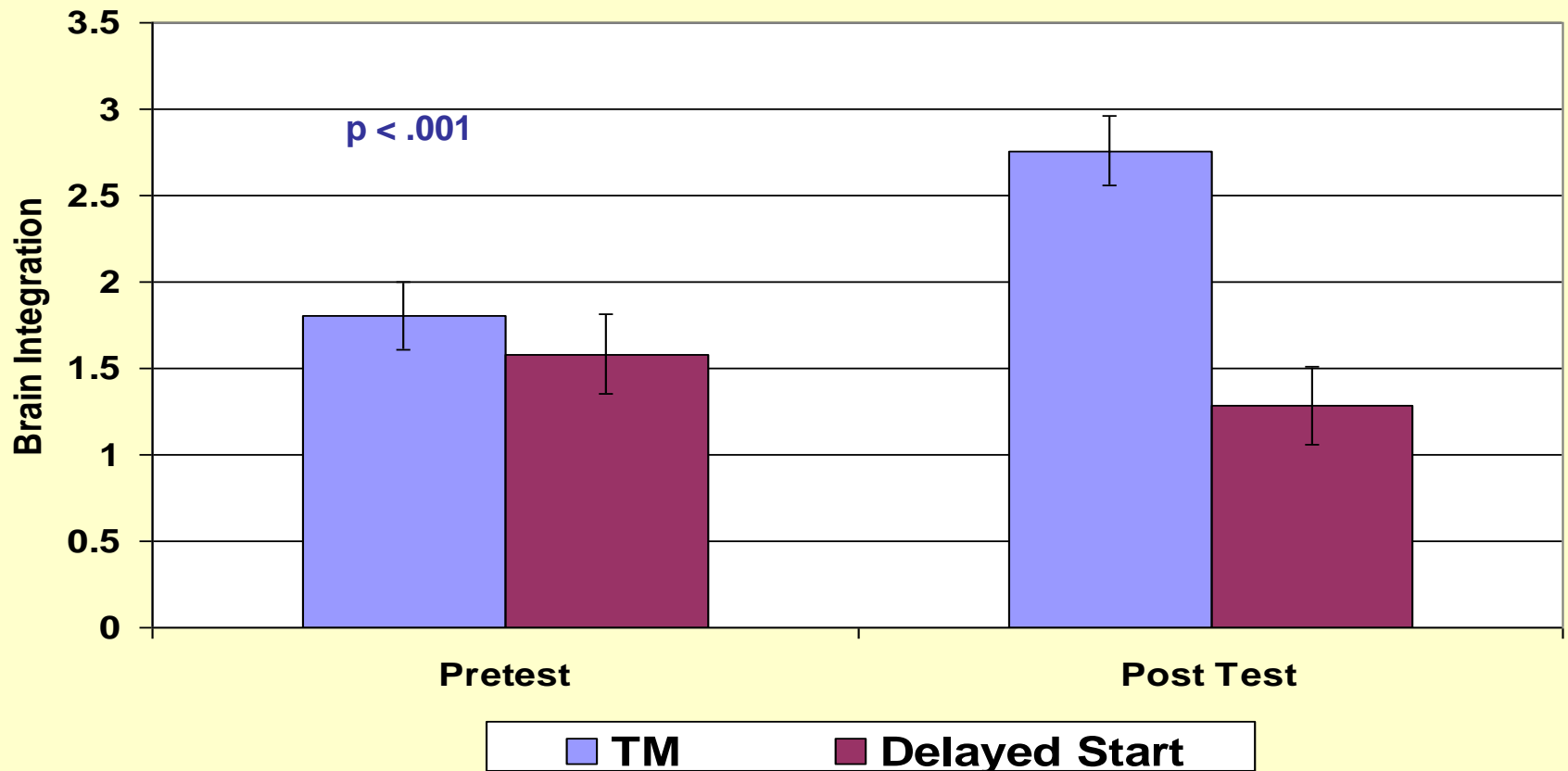
Meta-analysis of 97 studies



Alexander, C.N., Robinson, P., & Rainforth, M. (1994). Treating and preventing alcohol, nicotine, and drug abuse through Transcendental Meditation: A review and statistical meta-analysis. *Alcoholism Treatment Quarterly*, 11, 13–88.

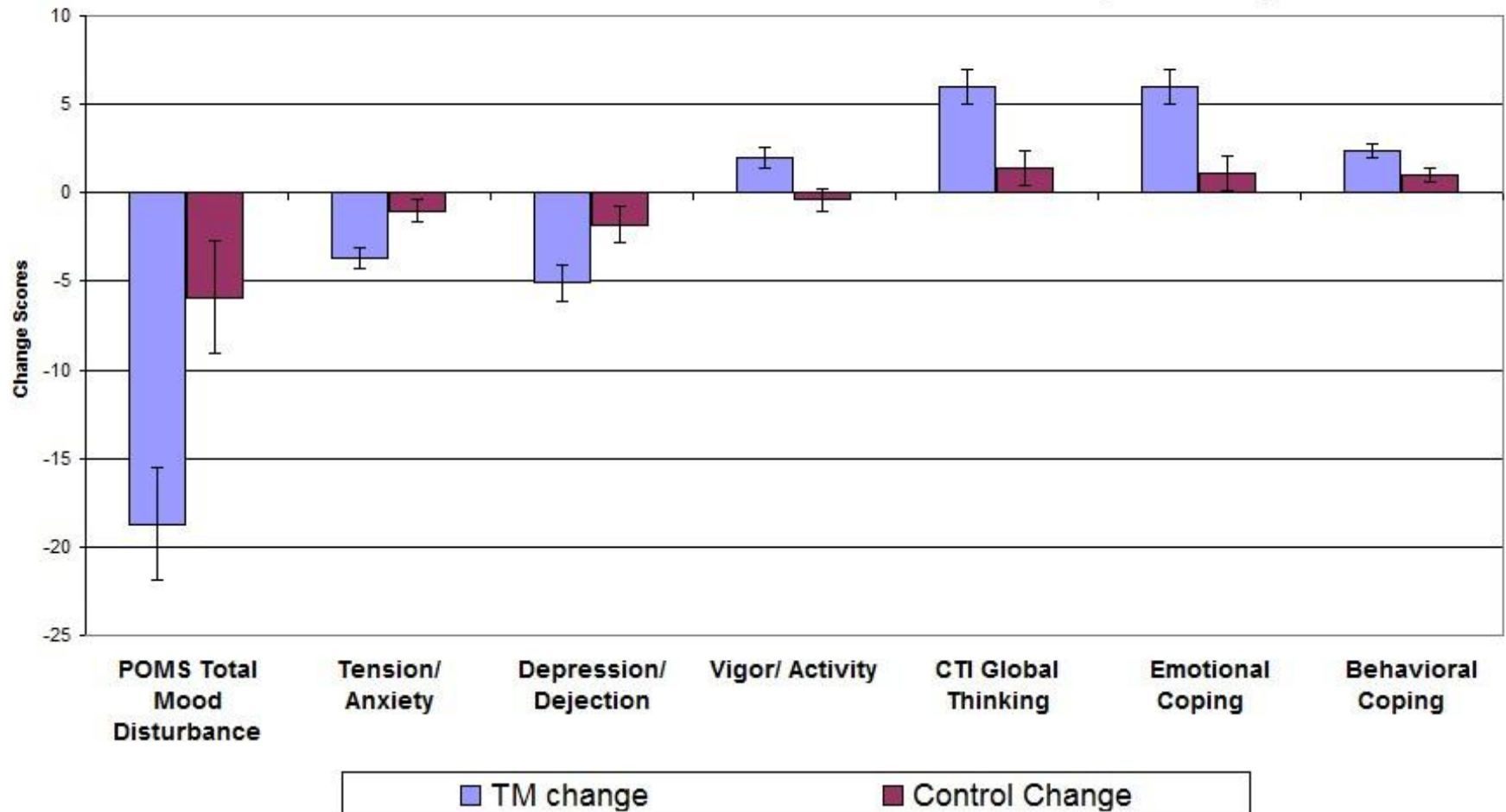
American University College Students

Brain Integration during tasks (3-mon TM)



Travis et al, 2009, International Journal of Psychophysiology, 71:170-176.

Change Scores on Profile of Mood States and Global Constructive Thinking after 3 Months Transcendental Meditation Practice (N=204)

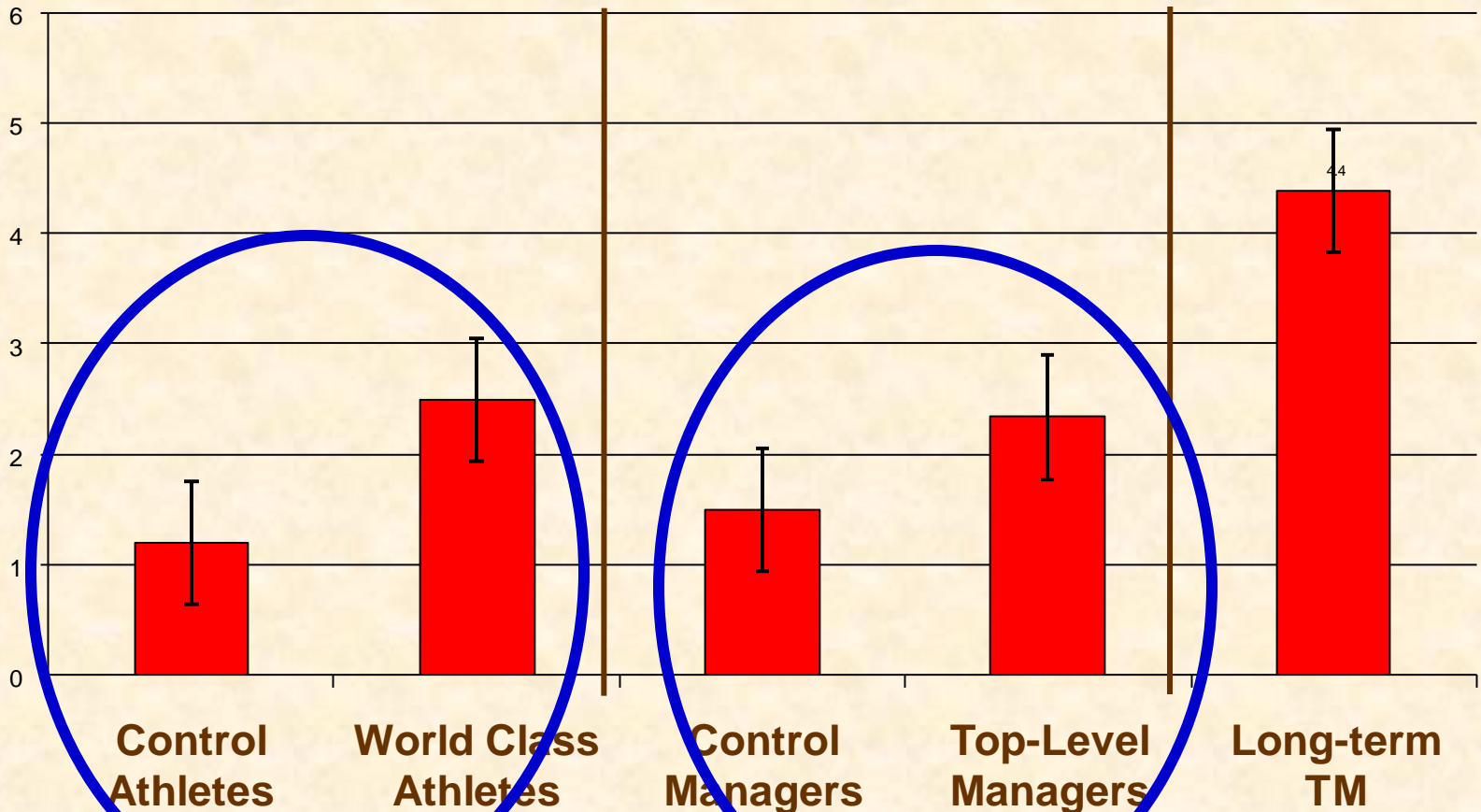


(Nidich et al, in press, American Journal of Hypertension)

Brain Integration Scale

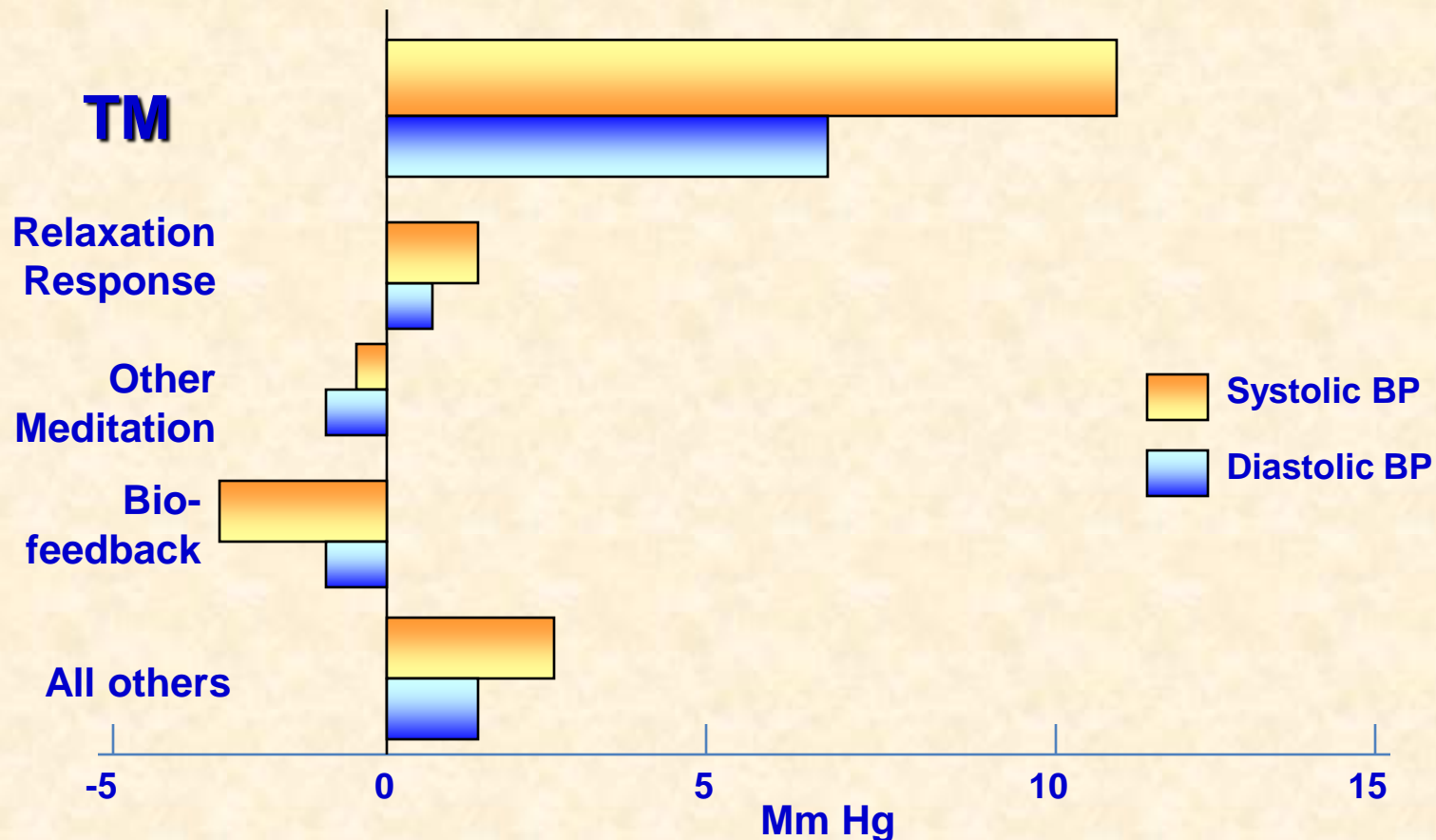
Frontal Coherence, Alpha Relative Power, and Brain Preparatory Response

Summed Z-scores of EEG
Parameter



Harung et al, (2011) Scandinavian Journal of Sport and Science, 1, 32-41.
Harung and Travis, (2012) Cognitive Processing, 13: 171-181

Effectiveness in Reducing Blood Pressure Meta-Analysis 34 Studies




American Heart Association, 2013

- **...the Transcendental Meditation technique is the only meditation practice that has been shown to lower blood pressure... all other meditation techniques (including MBSR) received a 'Class III, no benefit, Level of Evidence C' recommendation and are not recommended in clinical practice to lower blood pressure at this time.'**

Conclusion

TM meditation practice leads to a change of state—to pure consciousness—that gives one a new basis for processing experience.

The practical benefit is that you are more in control of your life able to thrive in a challenging world.

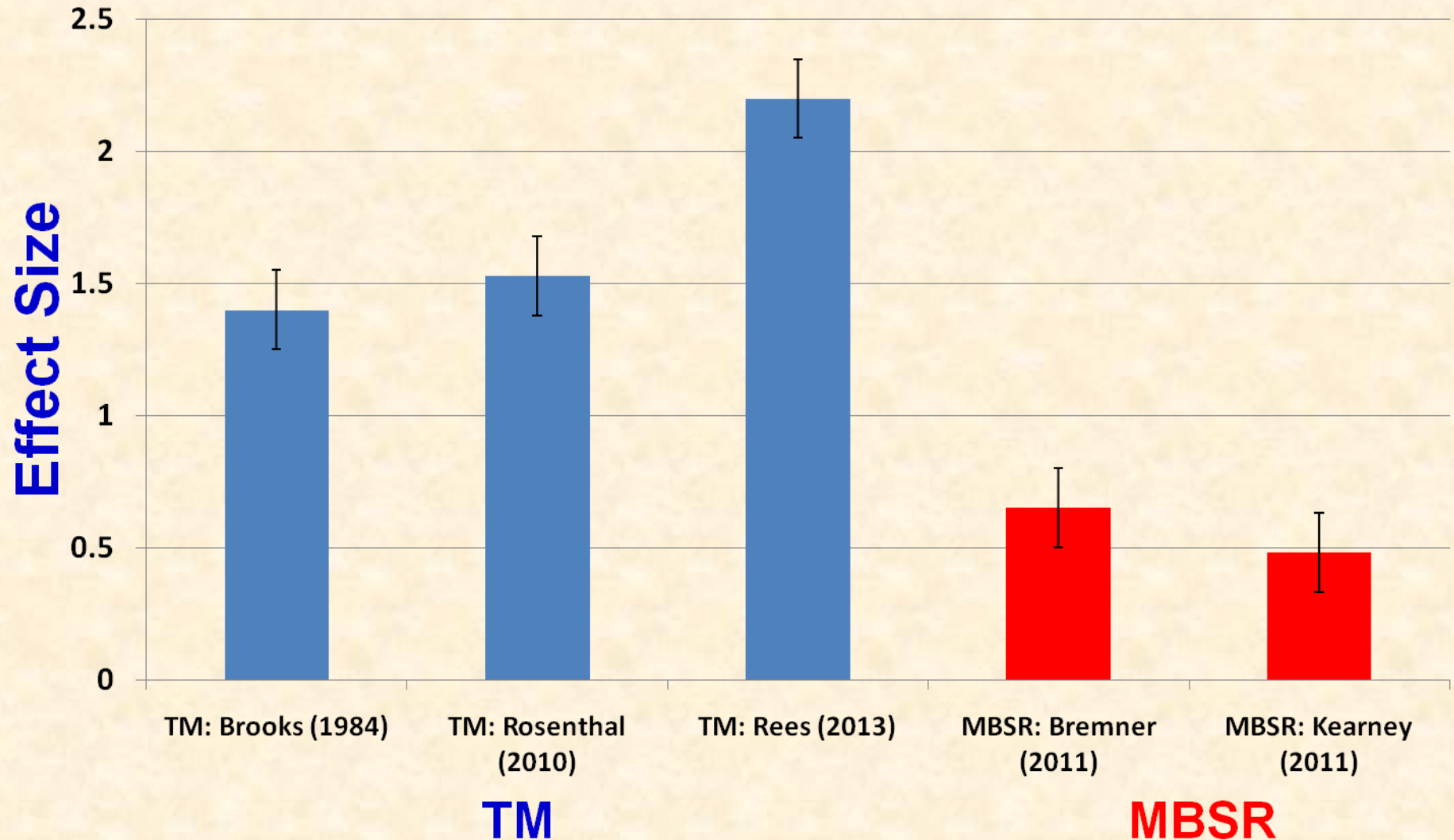
The background of the slide is a photograph of a man and a woman standing on a beach, looking out at the ocean during sunset. The sun is low on the horizon, creating a bright, golden glow that reflects on the water. The silhouettes of the man and woman are visible in the foreground, with the man on the left and the woman on the right. The overall mood is peaceful and contemplative.

Thank you.
Any Questions?

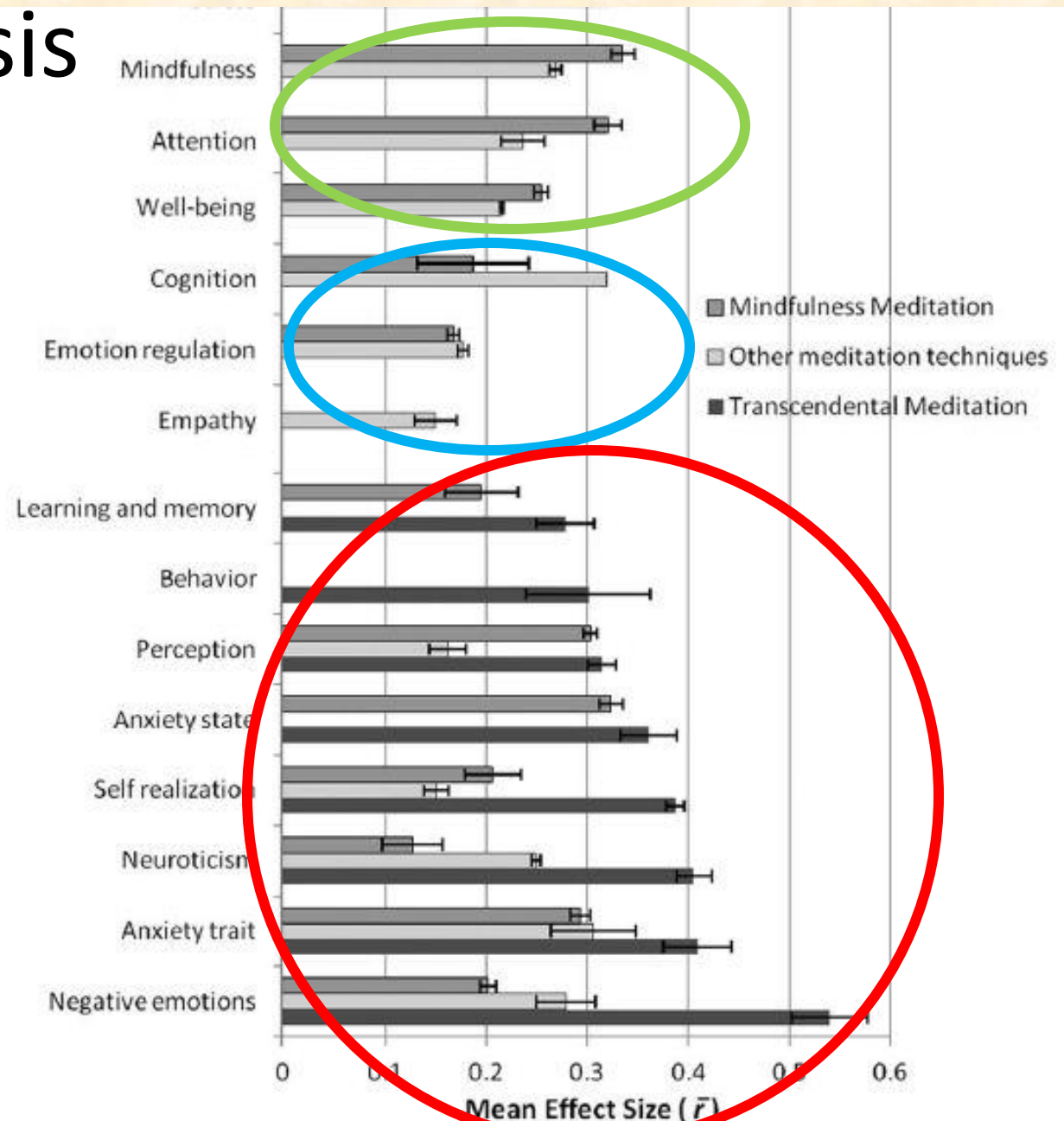
ftravis@mum.edu

drfredtravis.com

Effect Size for Decrease in PTS Symptoms: TM Practice and MBSR

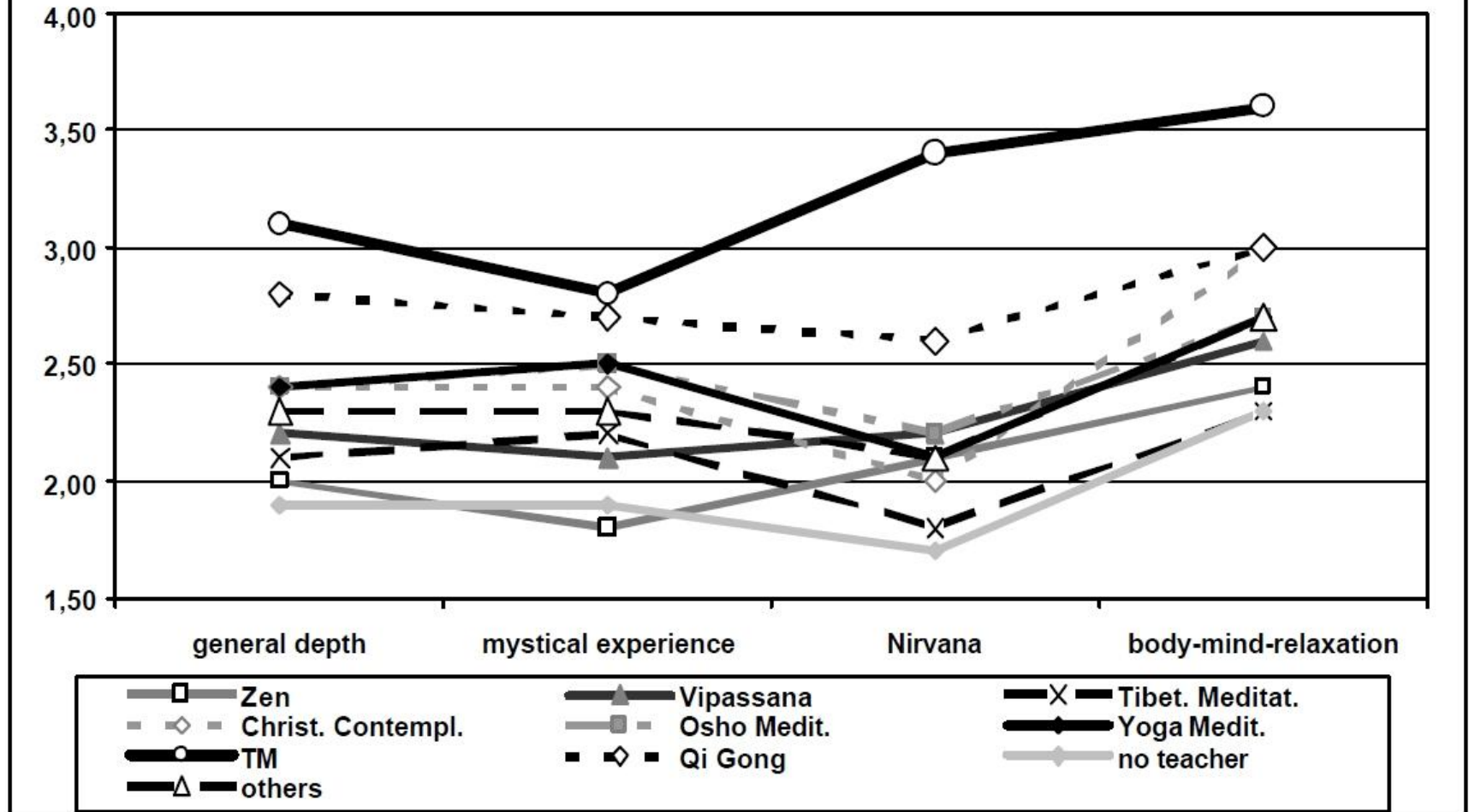


Meta analysis



Sedlmeier et al, 2012

Diagram 10: Meditation Depth

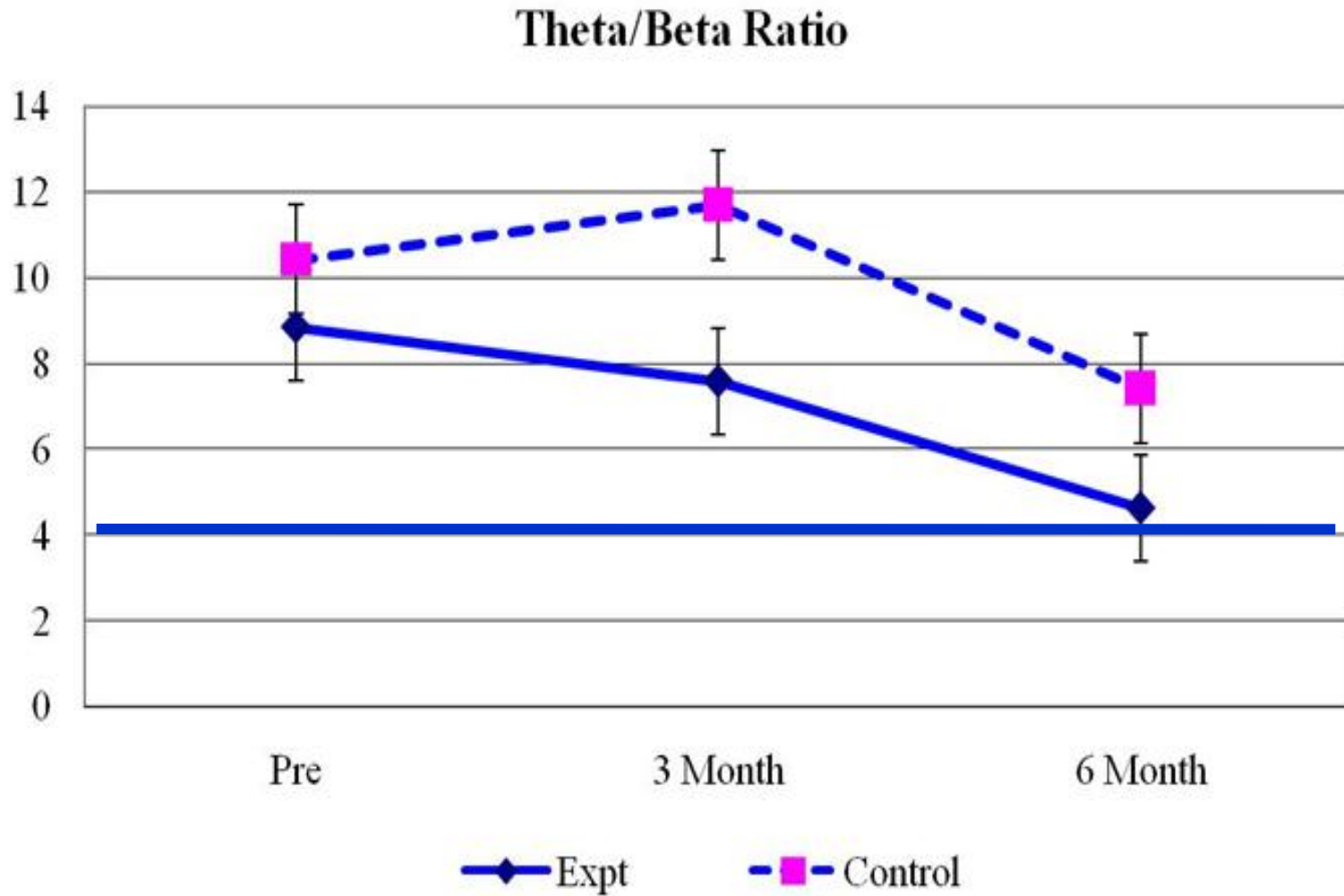


Engel, K. (2001), Meditative Experience and Different Paths: Data Based Analyses. Journal for Meditation and Meditation Research 1 (1), 35 - 53

TM and ADHD: Random Assignment/ Delayed Start Design

- **Eighteen students were randomly assigned to learn TM immediately (average age 12.9 years)**
- **or learn TM in three months (average age 13.0 years)**

TM Intervention



Normal

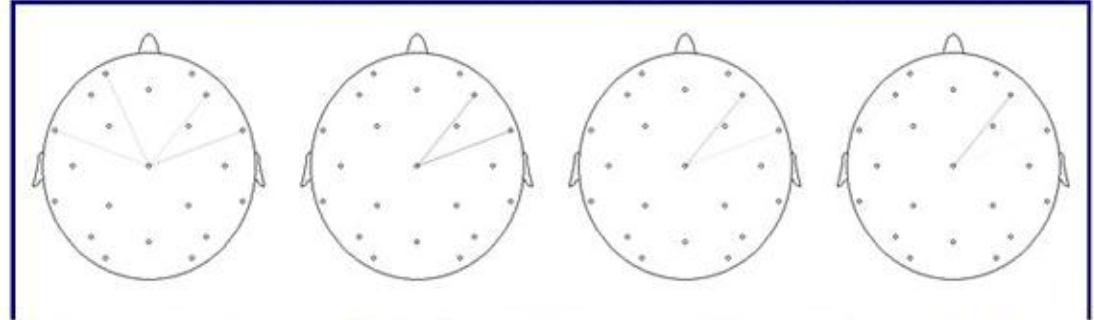
Coherence Difference Maps: Pre Minus Post

Control Group

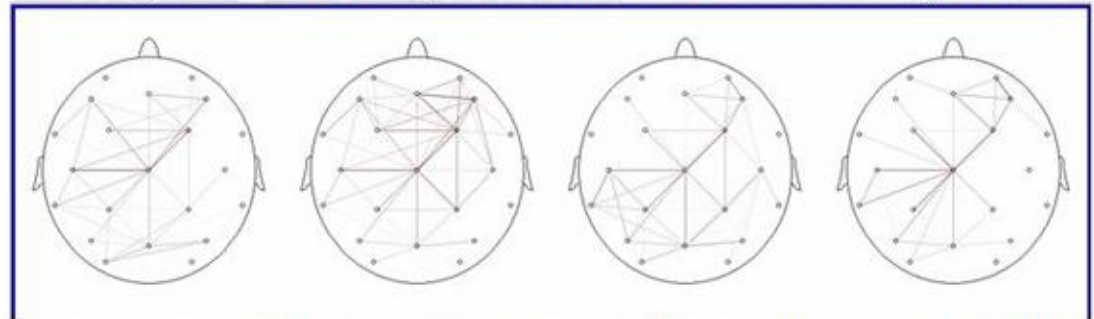
TM Group

**Control Group:
3-mon – 6-mon
posttest**

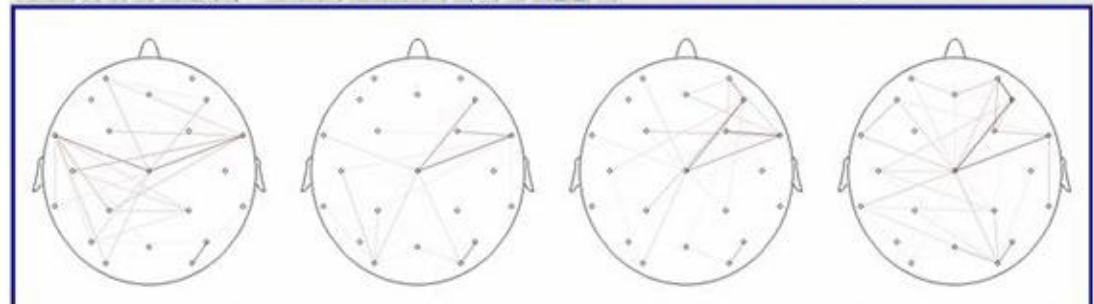
Control Group: Coherence during 3-mon Posttest – Coherence during Pretest



TM Group: Coherence during 3-mon Posttest – Coherence during Pretest



Control Group: Coherence during 6-mon – Coherence during 3-mon Posttest



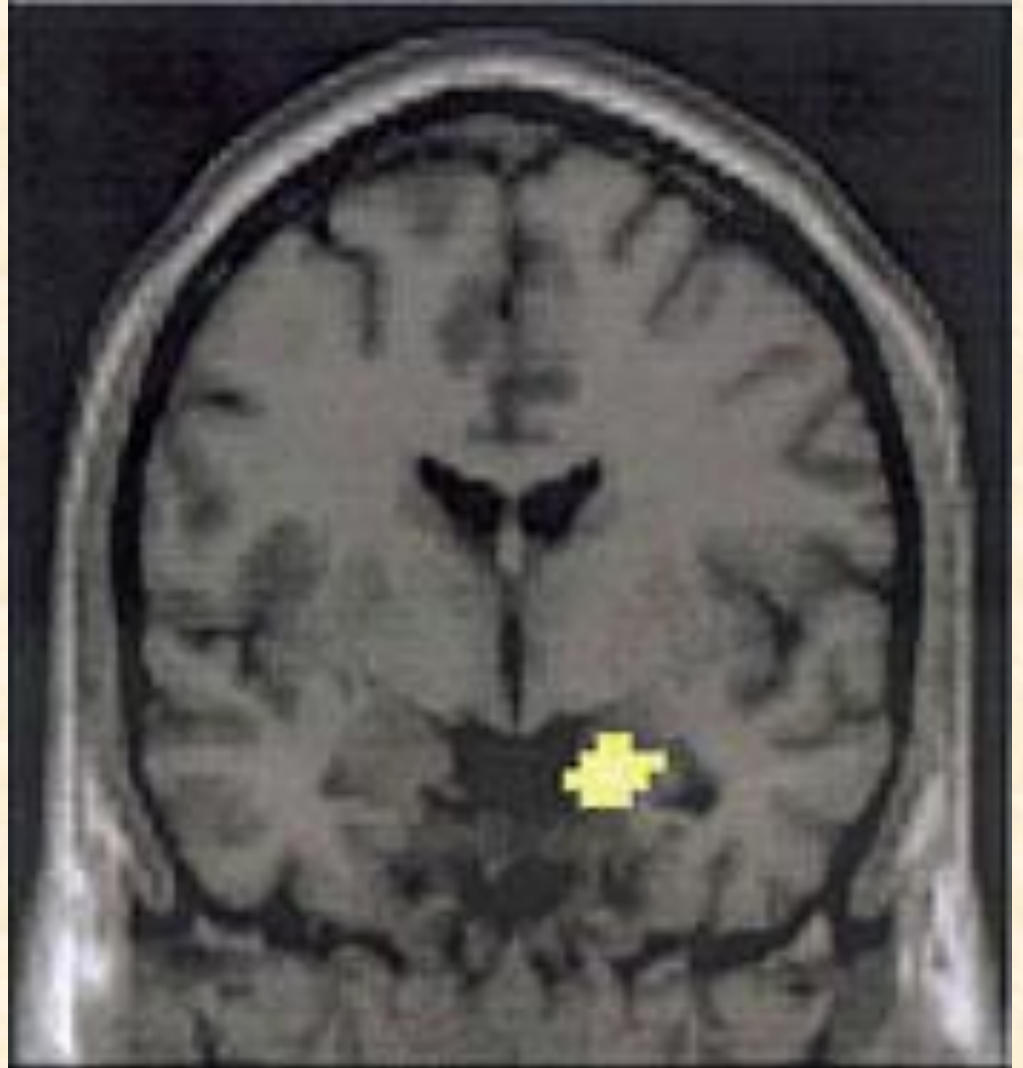
Theta (5-7.5Hz) Alpha (8-12 Hz) Beta1 (12.5-20 Hz) Gamma (20.5-50 Hz)



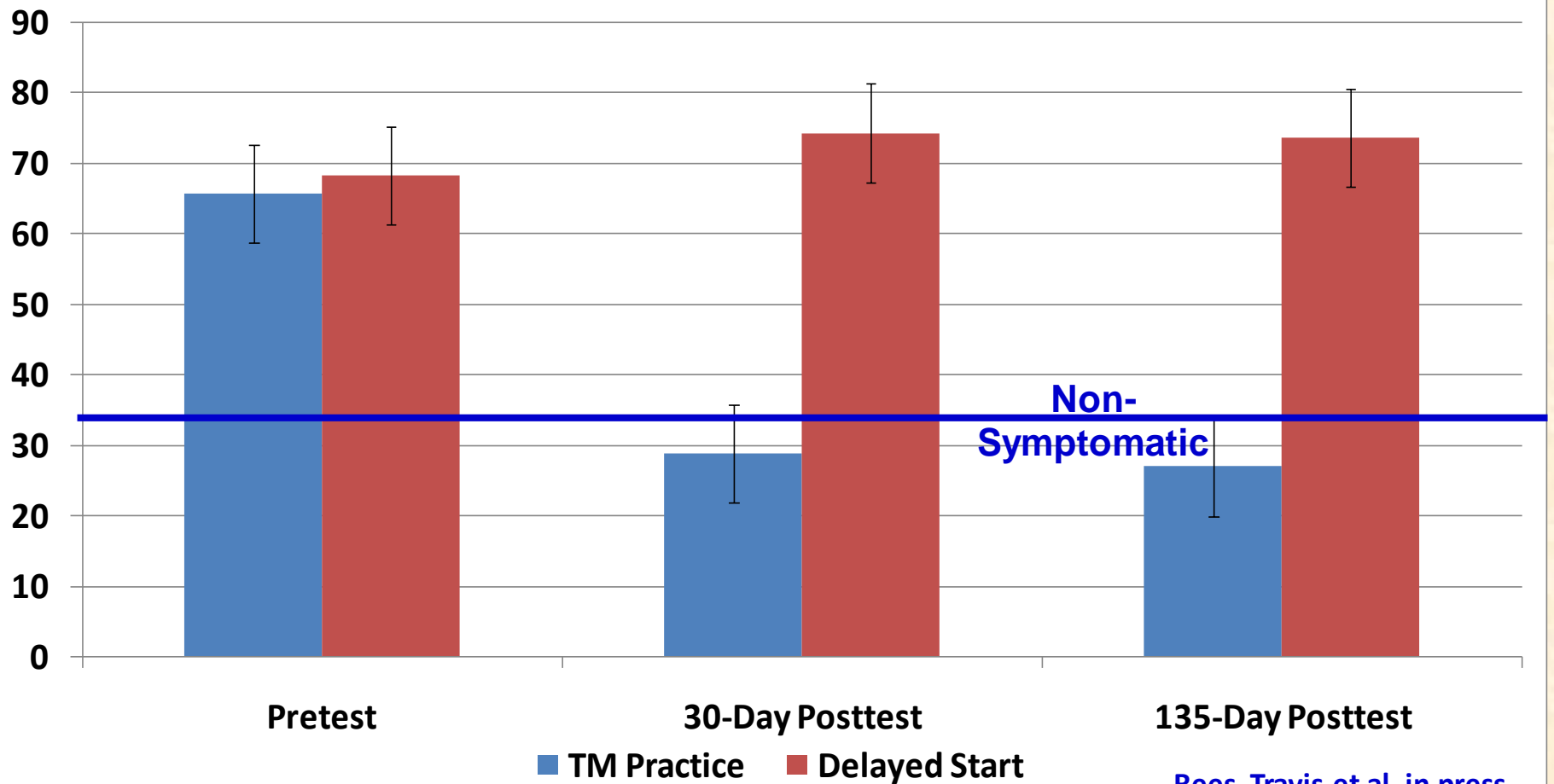
Brain and PTS

Amygdala is
more active.

Now, every
experience
produces high
fear state.

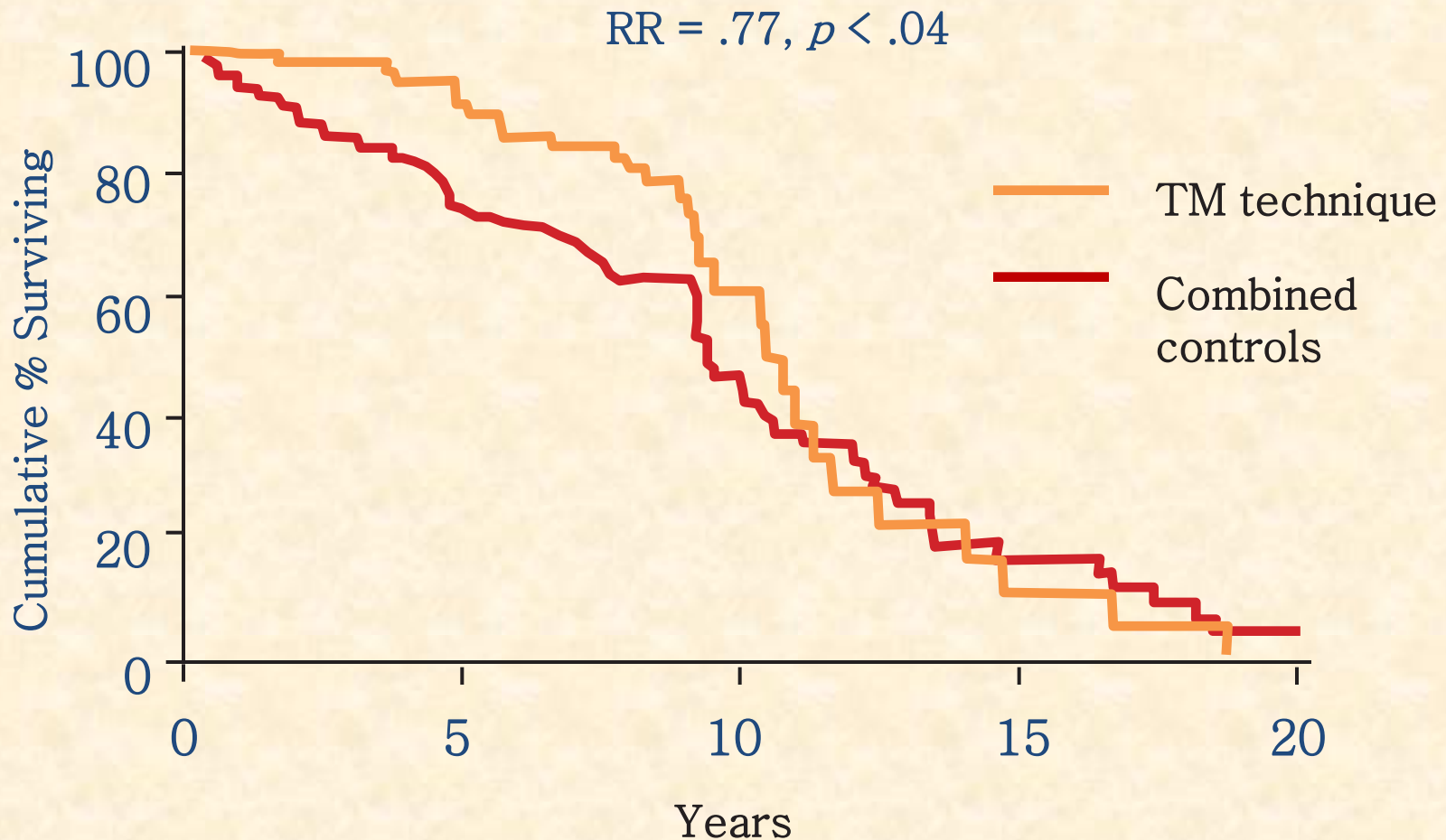


Posttraumatic Stress Scores in African Refugees Practicing the Transcendental Meditation Technique



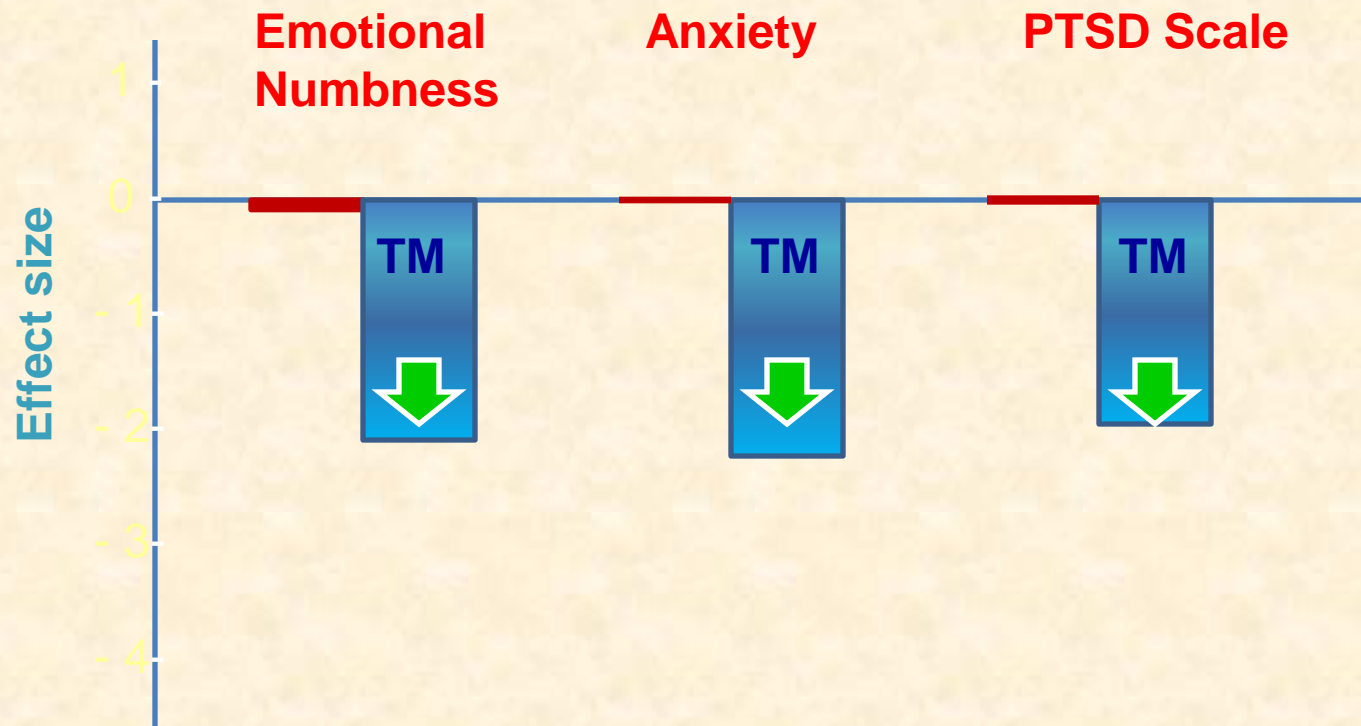
Rees, Travis et al, in press

Effects of stress reduction on all-cause mortality on older subjects: Pooled results of two randomized trials (N = 202)



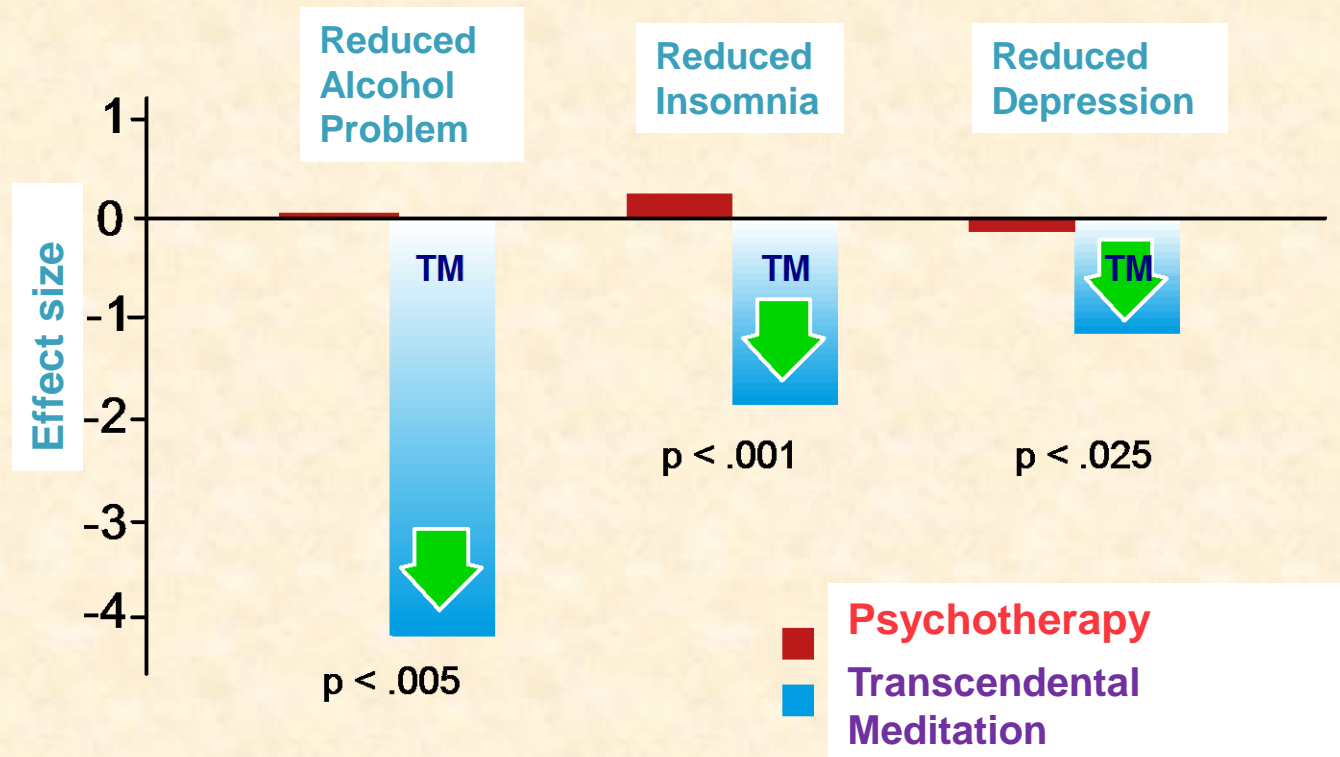
Schneider, R. H., Alexander, C. N., Staggars, F., Rainforth, M., Salerno, J. W., Hartz, A., et al. (2005). Long-term effects of stress reduction on mortality in persons ≥ 55 years of age with systemic hypertension. *American Journal of Cardiology*, 95 (9): 1060–1064.

Decreased Symptoms of Post-Traumatic Stress (RTC)



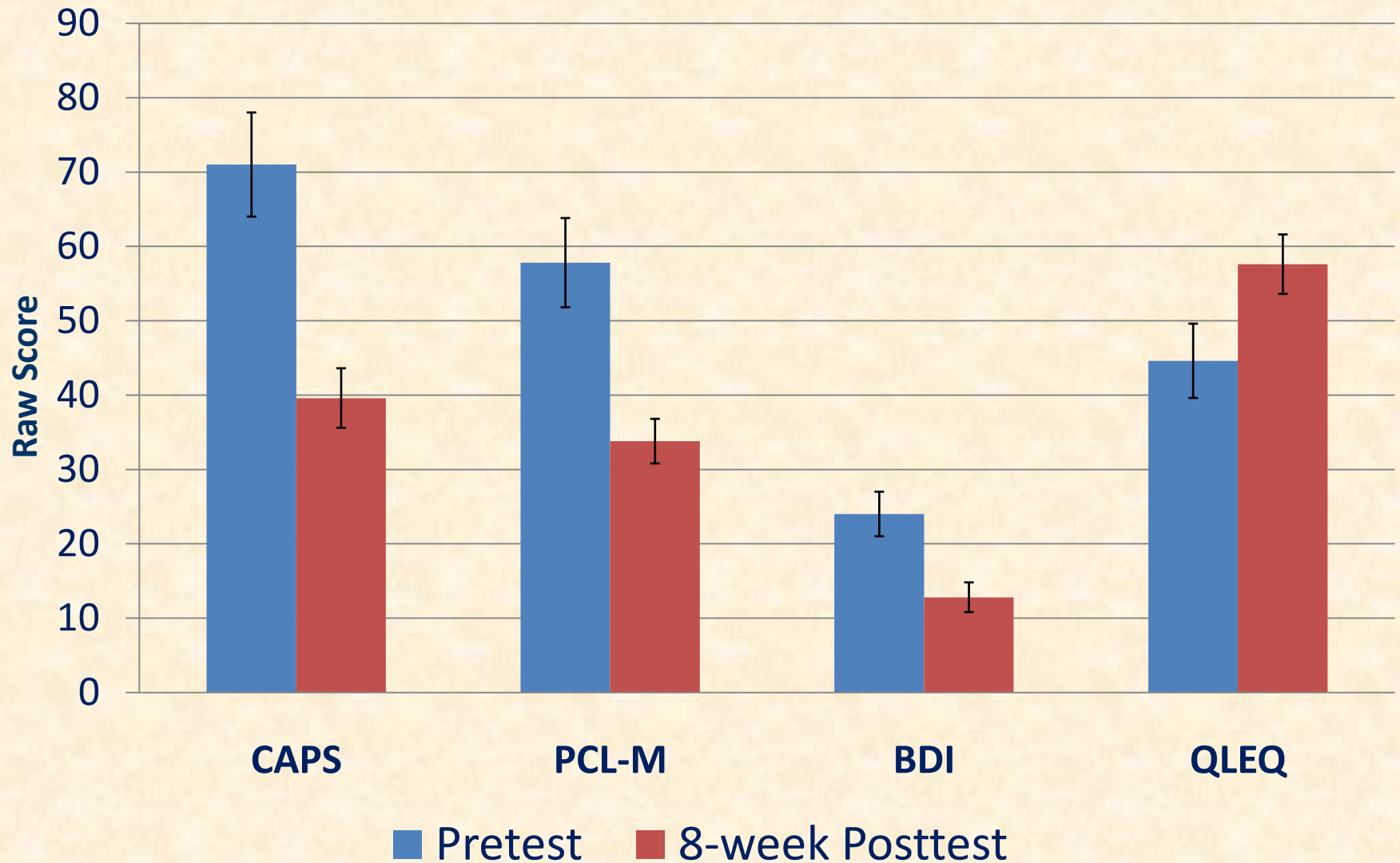
Journal of Counseling and Development. 1985;(64);212-215

Decreased Symptoms of Post-Traumatic Stress (RTC)



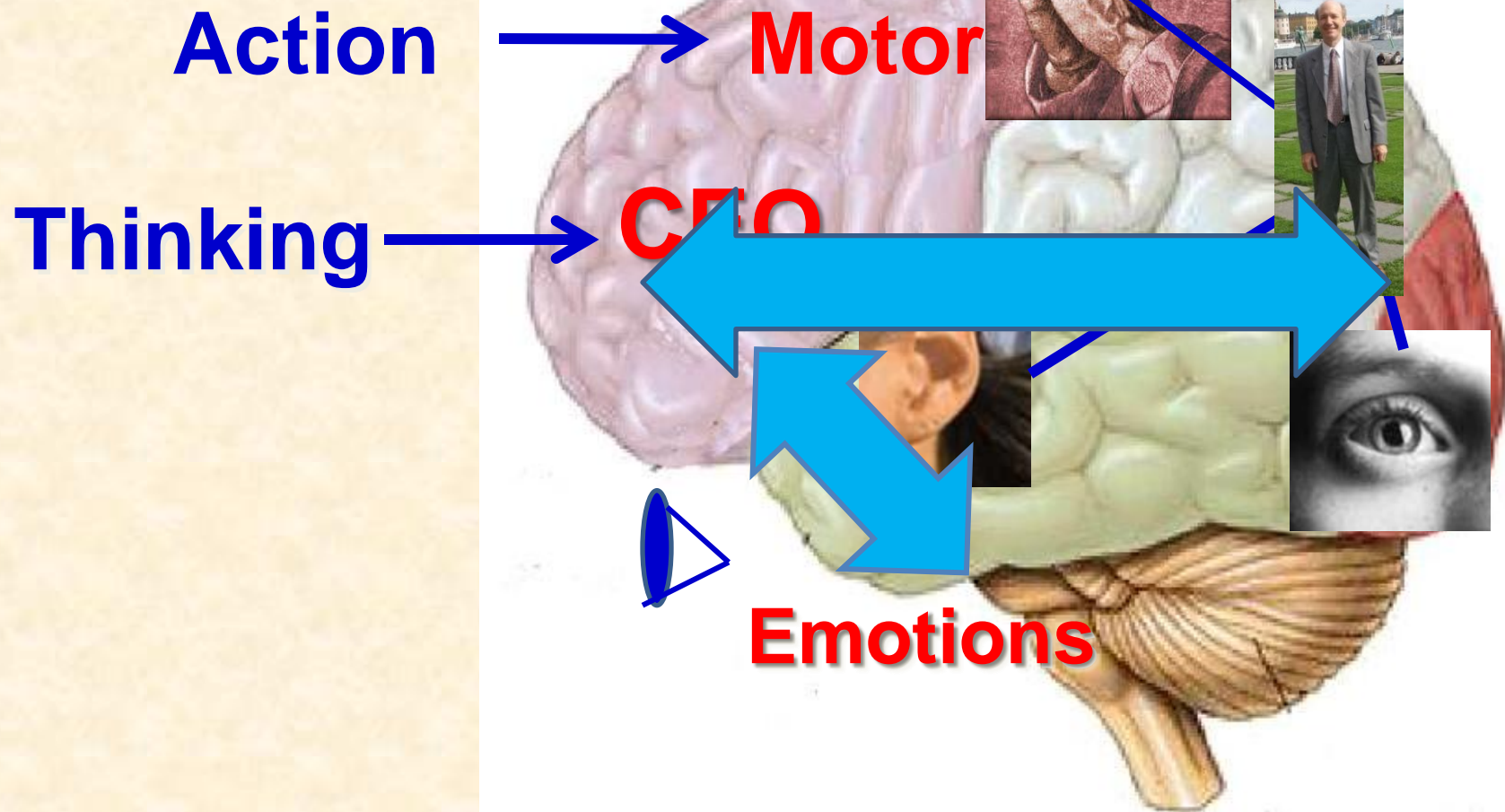
Journal of Counseling and Development. 1985;(64);212-215

Change in PTS Symptoms in Veterans from Iraq and Afghanistan after 8-Week TM Practice



Rosenthal, et al 2011. *Military Medicine*, 176,6:626, 2011

Conscious Choice—dynamic interplay between emotions and thinking



Highest

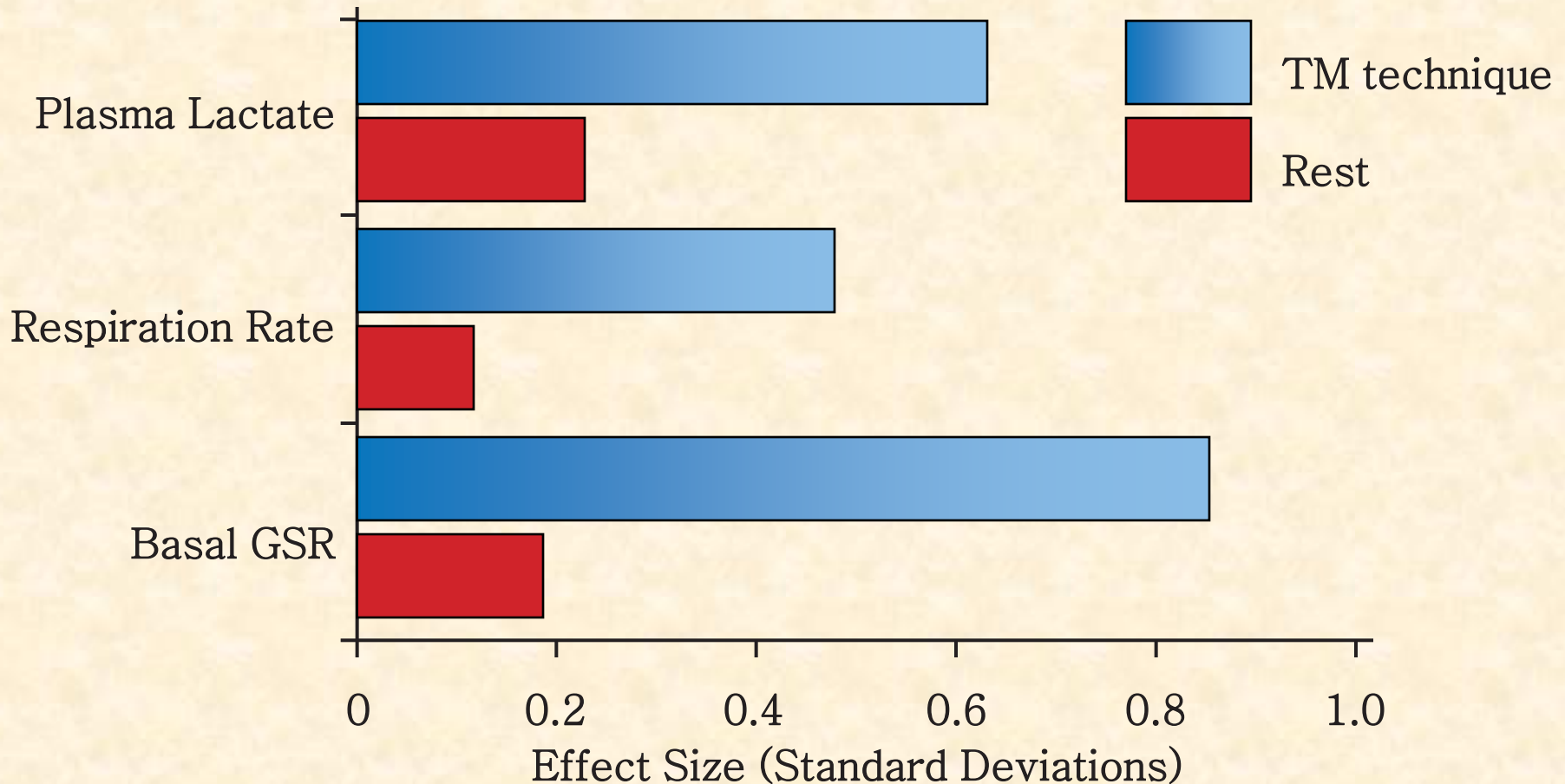
Cognitive Control

Lowest



Increased Physiological Relaxation

Meta-analysis of 32 studies

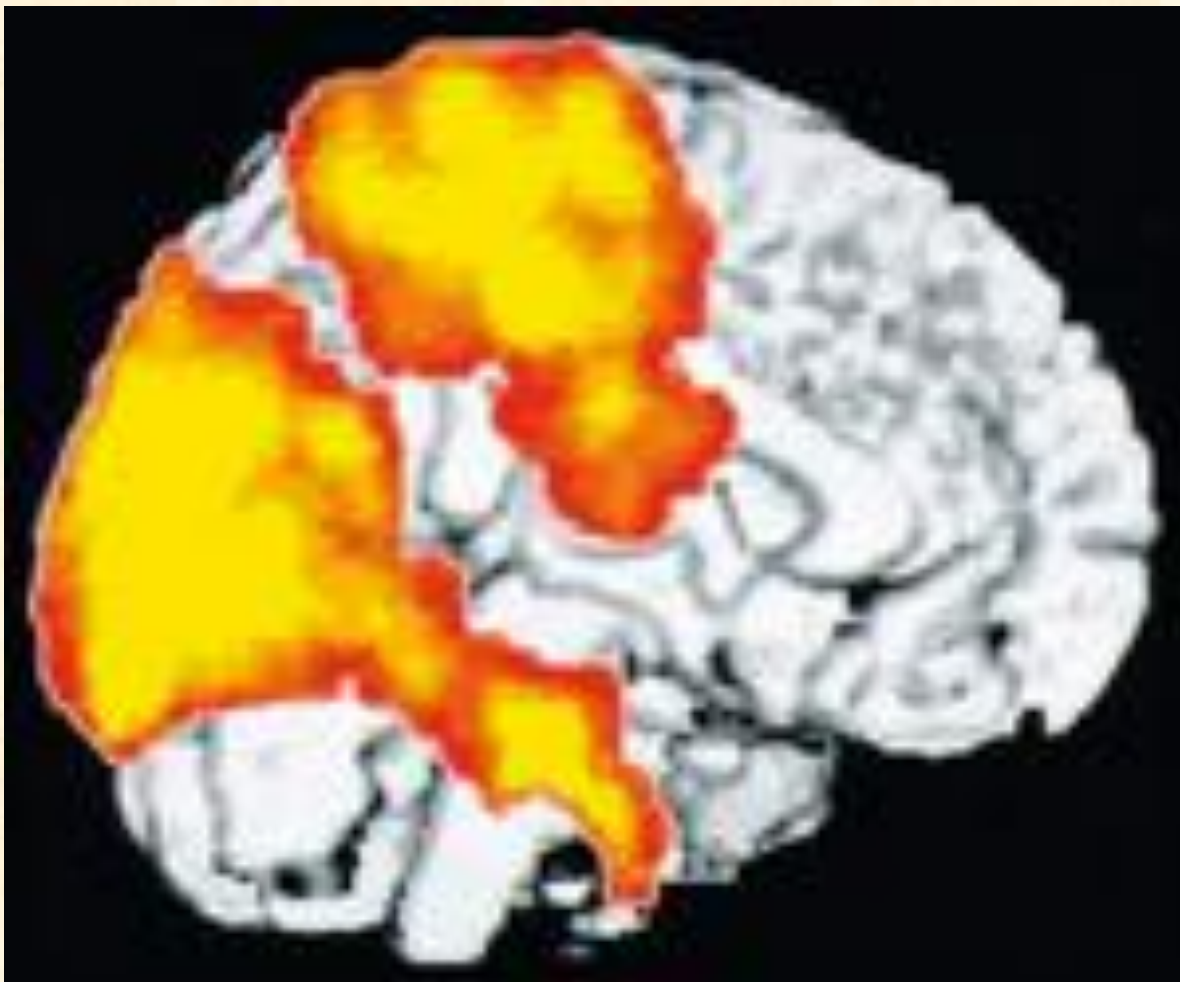


Dillbeck, M., and Orme-Johnson, D. (1987). *American Psychologist*, 42, 879–881.

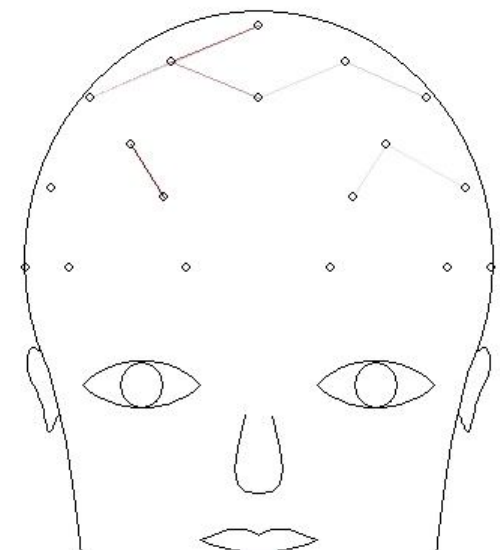
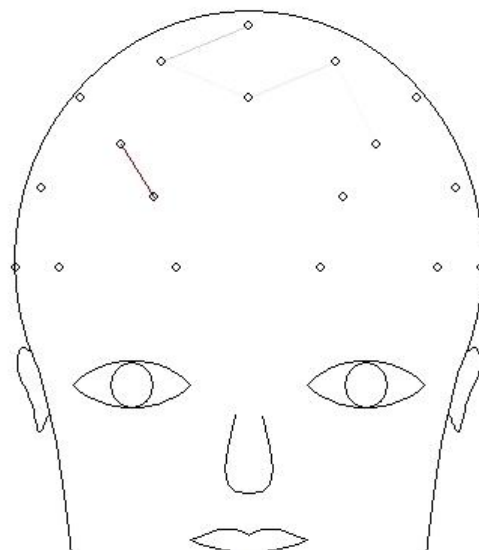
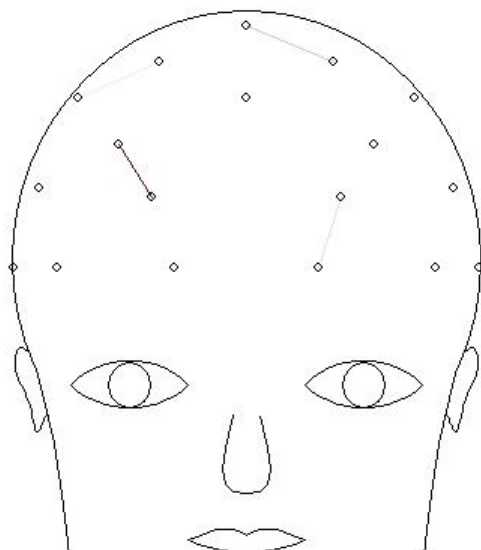
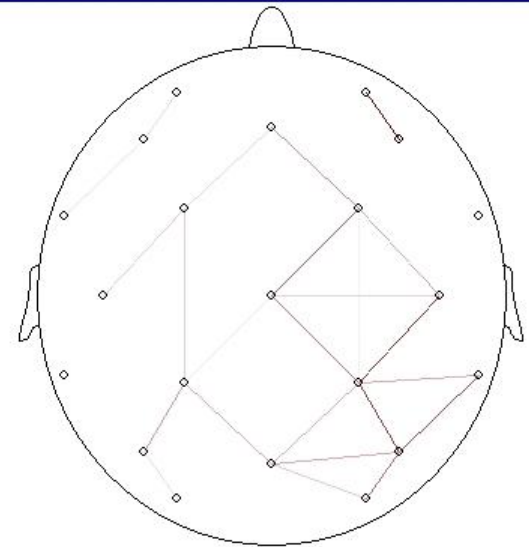
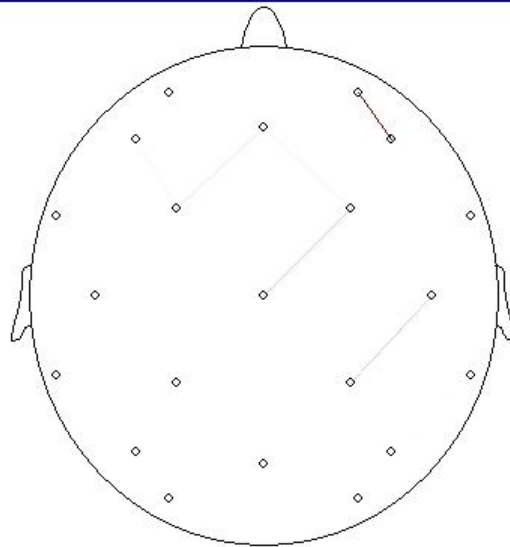
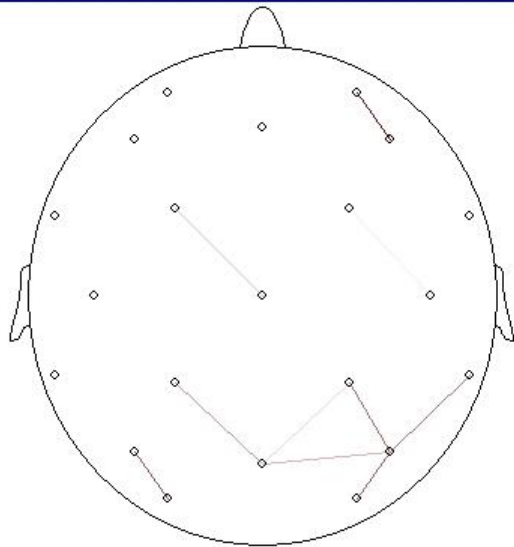
Killingsworth, Science, 2010



Yoga Nidra



Task: 5 sec – 0 sec

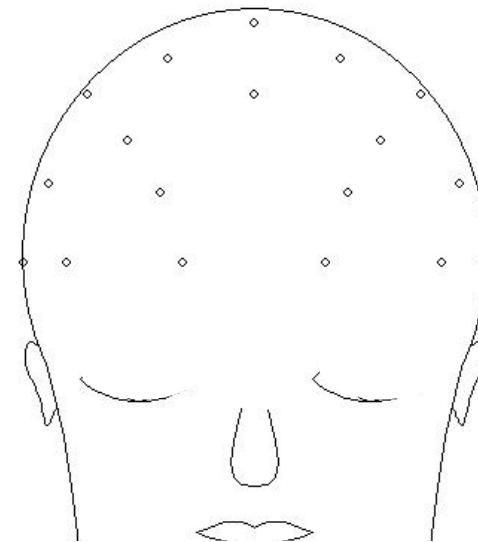
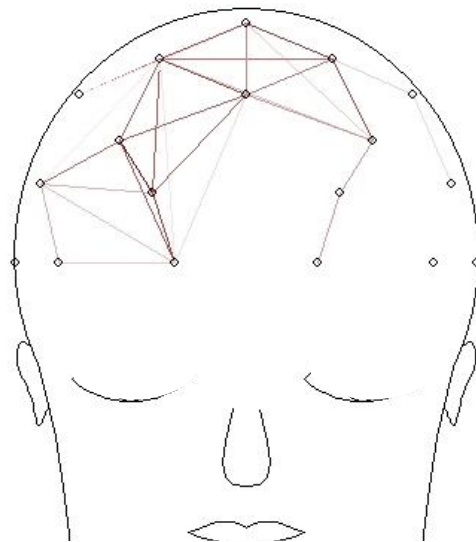
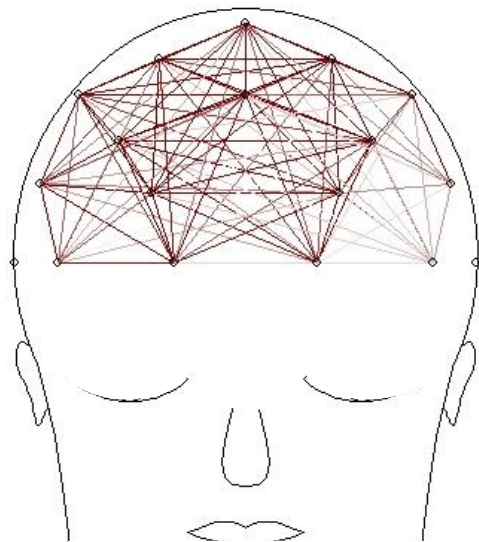
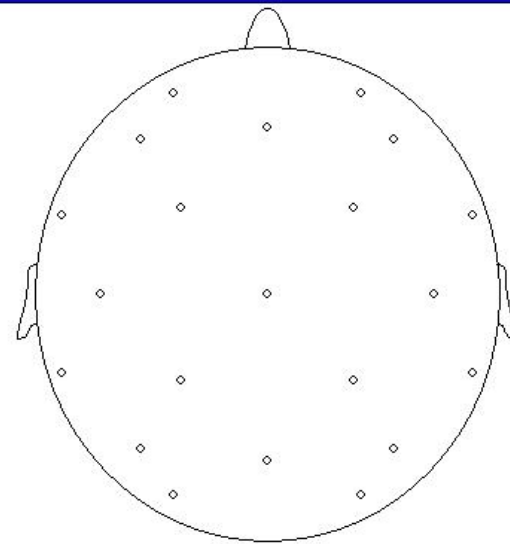
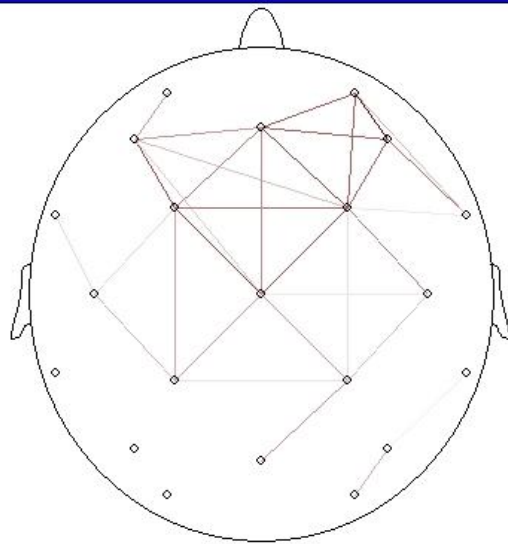
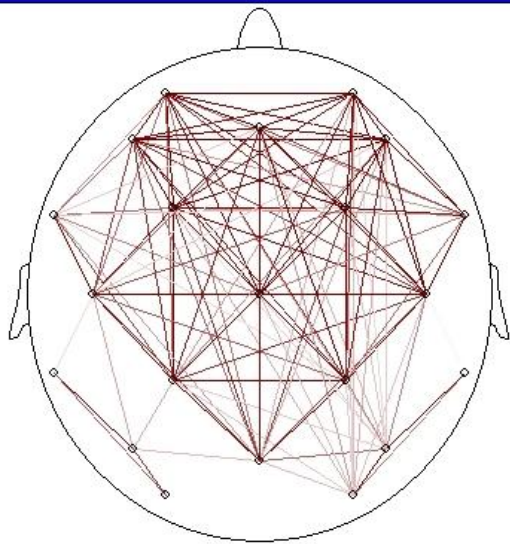


Alpha

Beta

Gamma

TM: 30 sec – 35 sec



Alpha

Beta

Gamma