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

High Road

Low Road:

Stimulus

sensory cortex

Midbrain: VTA

Amygdala
Nucleus Accumbens
Insula

Somatic Marker

Output

Frontal Cortex
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.

Hein et al, in press, Neuron
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.

Rested 36-hour Sleep Dep

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

Red = no sleep;
Yellow = rested
Stress reduces size of frontal (executive center) and hippocampal (memory) volume.

Challenge versus Stress

1. Challenge
2. Stress
**Focused Attention**

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

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**Open Monitoring**

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

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**Automatic Self-Transcending**

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

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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.

Automatic Self-Transcending

Conscious Mind

The TM Technique

Takes the mind from the active level to the source of thought, experienced as restful alertness

Source of Thought
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.
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)

Effectiveness in Reducing Trait Anxiety
Meta-analysis of 146 studies

Effectiveness in Decreasing Drug Abuse
Meta-analysis of 70 studies

Effect Size (Standard Deviations)

- **TM technique**
- **Peer Influence**
- **Preventive Education**

Effectiveness in Decreasing Alcohol Use
Meta-analysis of 97 studies

Brain Integration during tasks (3-mon TM)

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

Effectiveness in Reducing Blood Pressure
Meta-Analysis 34 Studies

- TM
- Relaxation Response
- Other Meditation
- Biofeedback
- All others

American Journal of Health Promotion. 1998:(5)297-298
• ...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.
Thank you.
Any Questions?

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

![Bar chart showing effect size for decrease in PTS symptoms for TM and MBSR practices.](chart.png)
Meta analysis

Sedlmeier et al, 2012
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

Coherence Difference Maps: Pre Minus Post

Control Group

TM Group

Control Group: 3-mon – 6-mon posttest
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

Pretest 30-Day Posttest 135-Day Posttest

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)

Decreased Symptoms of Post-Traumatic Stress (RTC)

Journal of Counseling and Development. 1985:(64);212-215
Decreased Symptoms of Post-Traumatic Stress (RTC)
Change in PTS Symptoms in Veterans from Iraq and Afghanistan after 8-Week TM Practice

Conscious Choice—dynamic interplay between emotions and thinking
Highest

Cognitive Control

Lowest
Increased Physiological Relaxation
Meta-analysis of 32 studies

Killingsworth, Science, 2010
Yoga Nidra
Task: 5 sec – 0 sec

Alpha

Beta

Gamma
TM: 30 sec – 35 sec

Alpha  Beta  Gamma