Mindfulness for resilience, wellbeing and sustainable performance

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Mind wandering and happiness

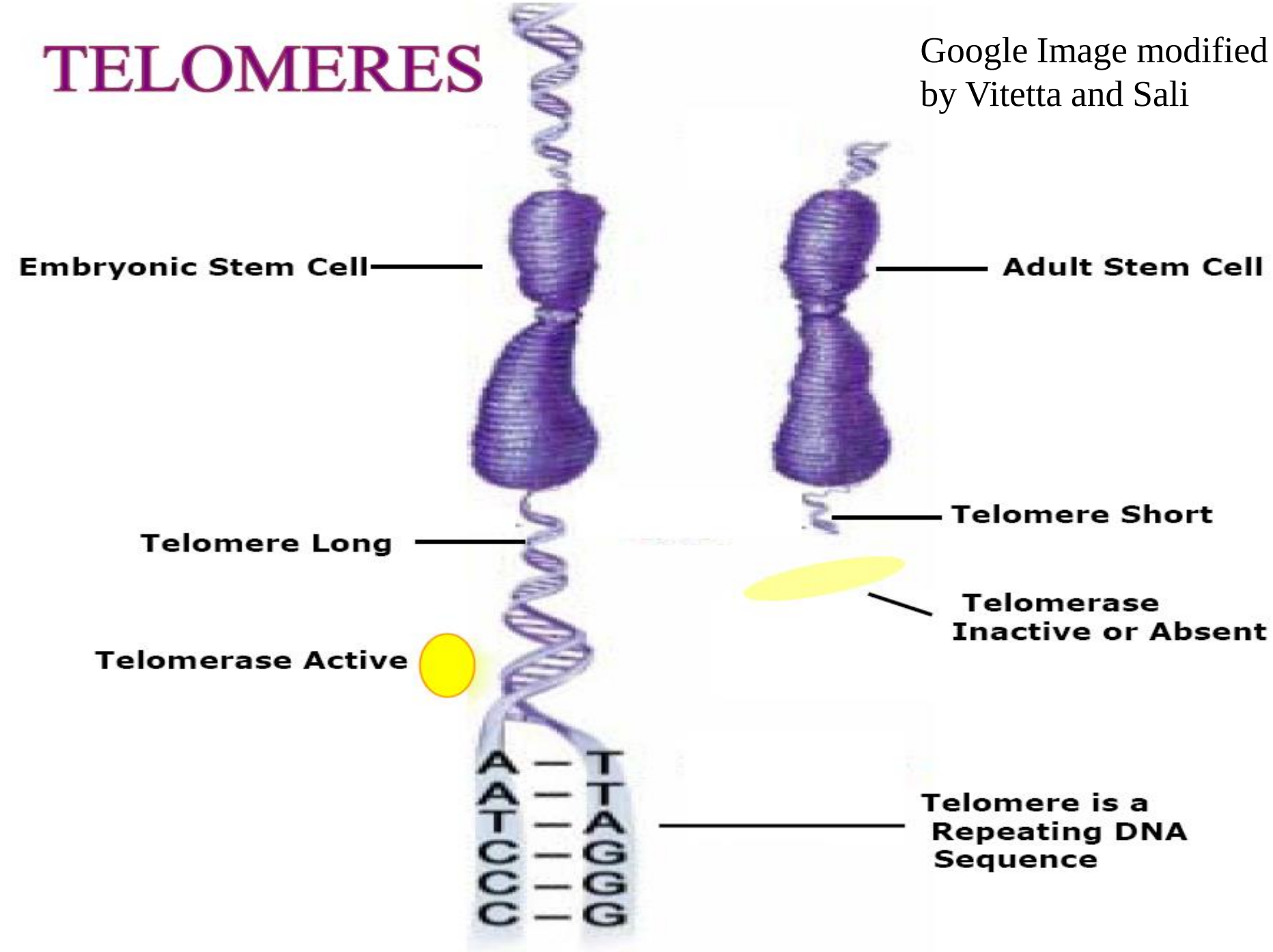
- “In conclusion, a human mind is a wandering mind, and a wandering mind is an unhappy mind. The ability to think about what is not happening is a cognitive achievement that comes at an emotional cost.”
  - Killingsworth MA, Gilbert DT. A Wandering Mind Is an Unhappy Mind. *Science* 12 November 2010: Vol. 330. no. 6006, p. 932 DOI: 10.1126/science.1192439

Allostatic load

- Prolonged stress leads to wear-and-tear on the body (allostatic load)
  - Mediated through the Sympathetic Nervous System
- Allostatic load leads to:
  - Impaired immunity, atherosclerosis, metabolic syndrome, bone demineralization
  - Atrophy of nerve cells in the brain
    - **Hippocampal formation:** learning and memory
    - **Prefrontal cortex:** working memory, executive function
  - Growth of **Amygdala** mediates fear response
- Many of these processes are seen in chronic depression and anxiety
    - McEwen BS. Ann N Y Acad Sci. 2004;1032:1-7.

TELOMERES

Google Image modified by Vitetta and Sali



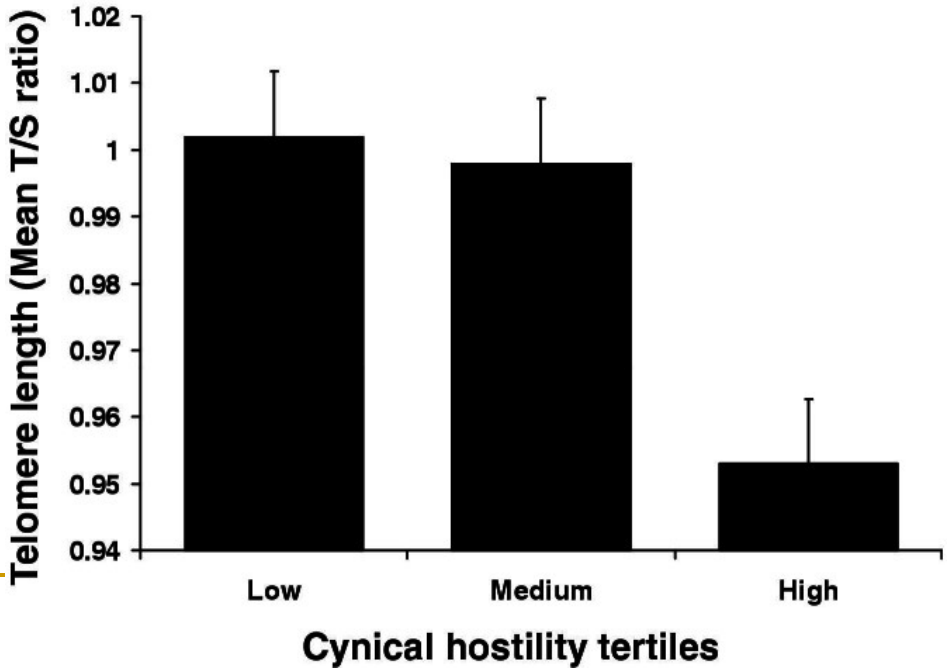
Allostatic load and telomeres

- Men with indications of higher allostatic load also had shorter telomeres
- Shorter telomeres also associated with reduced social support, lower optimism, higher hostility, and greater early life adversity independent of age, socioeconomic status, and BMI
  - Zalli A, Carvalho LA, Lin J, et al. Shorter telomeres with high telomerase activity are associated with raised allostatic load and impoverished psychosocial resources. Proc Natl Acad Sci U S A. 2014 Mar 25;111(12):4519-24. doi: 10.1073/pnas.1322145111.

Hostility and telomere length

- High-hostile men had significantly shorter leukocyte TL than their low-hostile counterparts
- The relationship between hostility and disease is stronger in men than in women, and men generally have a shorter life expectancy than women

Brydon L, Lin J, Butcher L, Hamer M, Erusalimsky JD, Blackburn EH, Steptoe A. Hostility and cellular aging in men from the Whitehall II cohort. Biol Psychiatry. 2012 May 1;71(9):767-73. doi: 10.1016/j.biopsych.2011.08.020.



Genetic ageing and pessimism

- Combination of lower optimism and higher pessimism increases risk for disease and early mortality
- Study investigated whether tendency towards optimism or pessimism associated with Telomere Length and IL-6 (inflammation)
- Pessimism associated with shorter TL (a decade of accelerated ageing) and higher inflammation
  - Lin J,Dhabhar FS, Wolkowitz O, Tillie JM, Blackburn E, Epel E.Pessimism correlates with leukocyte telomere shortness and elevated interleukin-6 in post-menopausal women. Brain Behav Immun. 2009 May;23(4):446-9.

Mind wandering and ageing

- The greater the level of mind wandering, the greater the level of telomere shortening (a marker of biological age)

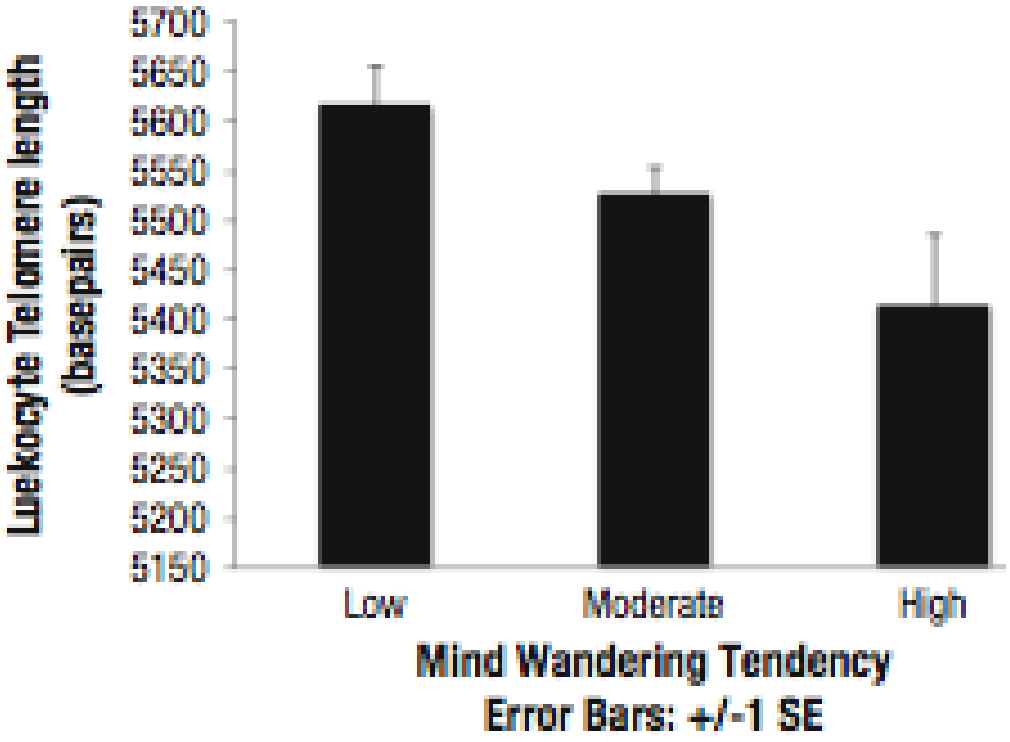
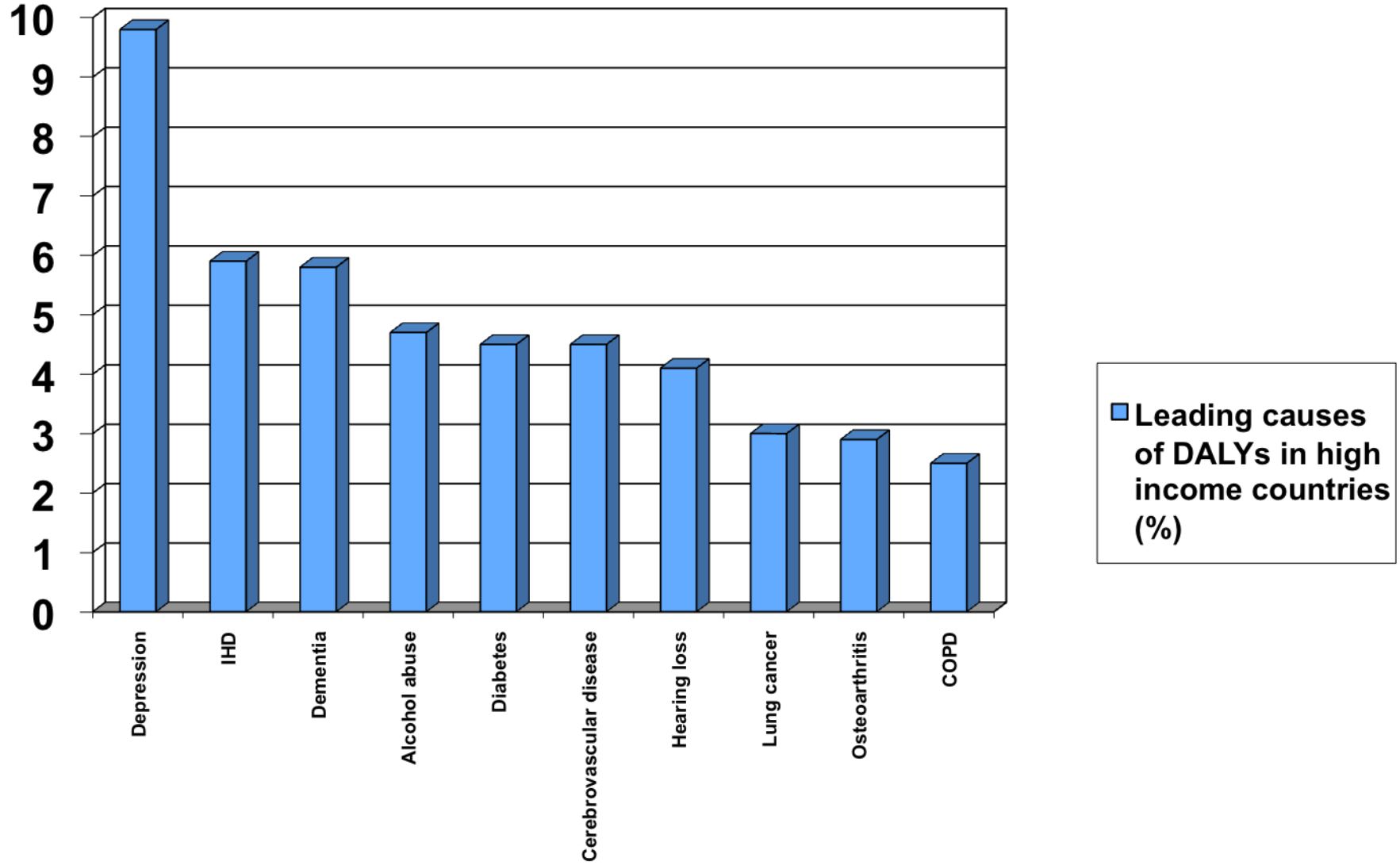


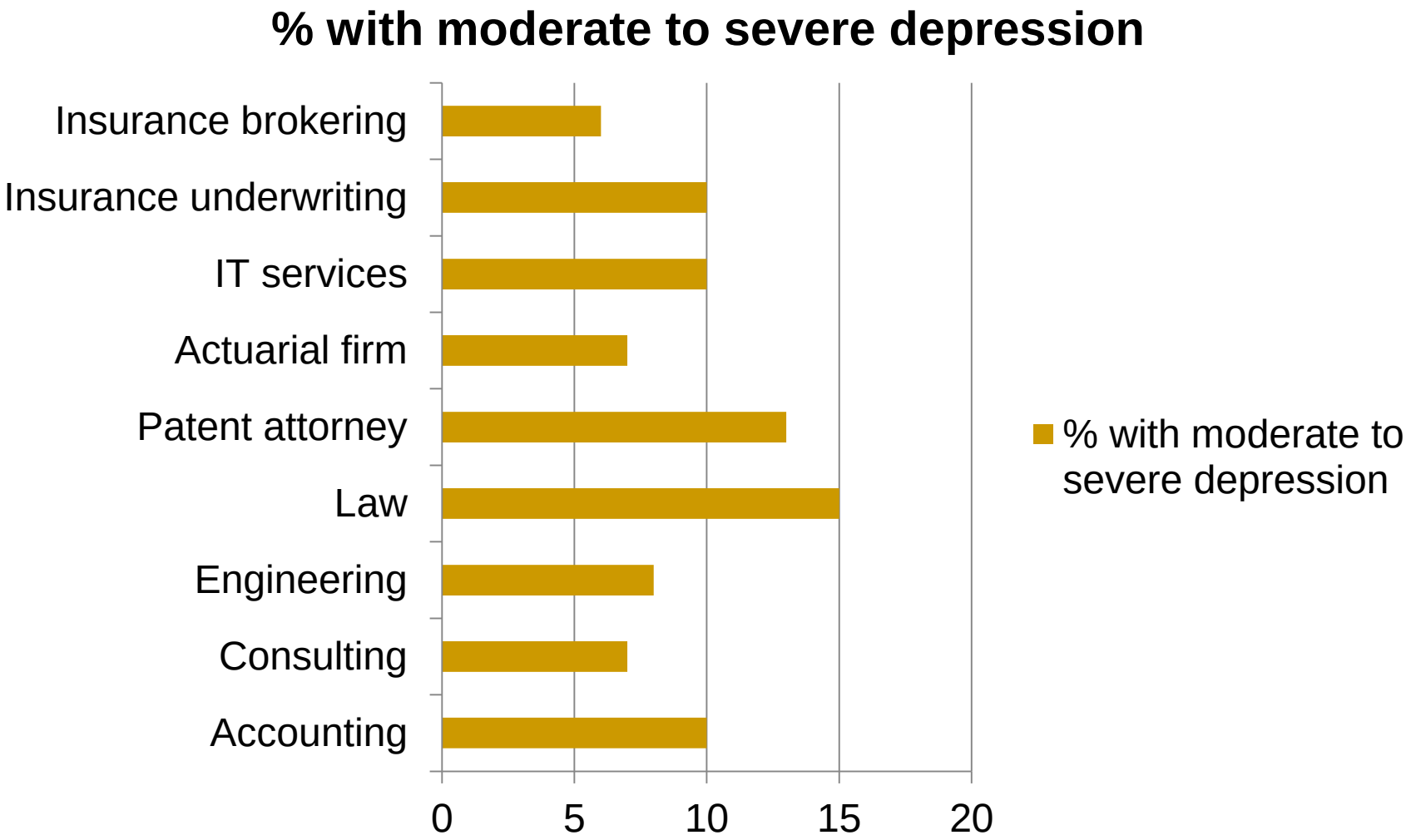
Fig. 1. Leukocyte telomere length by greater mind-wandering group.

Epel ES, Puterman E, Lin J, Blackburn E, et al. Wandering Minds and Aging Cells. Clinical Psychological Science 2012, in press.



Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. PLoS Med. 2006 Nov;3(11):e442.

Law student and lawyer mental health



Beyond Blue survey 2007

Mental Health & The Legal Profession

- Lawyers have highest levels of **anxiety** & **depression** (> dentists)
  - 20% barristers
  - 33% solicitors

    - Whealing (2013)

- Depressed lawyers tend to abuse alcohol/drugs

    - Beaton Consulting (2007)

Burnout and psychiatric morbidity in new medical graduates

- 8 months into internship: 75% interns had burnout
- 73% (of interns) met criteria for psychiatric morbidity on at least one occasion
  - Willcock SM et al. Burnout and psychiatric morbidity in new medical graduates. Med J Aust. 2004;181(7):357-60.

Attention Deficit Trait

- Newly recognized neurological phenomenon: attention deficit trait (ADT)
  - Response to hyperkinetic environment
- Trying to deal with too much input, results in:
  - Black-and-white thinking; perspective and shades of grey disappear
  - Difficulty staying organized, setting priorities, and managing time
  - Feel a constant low level of panic and guilt
    - Hallowell EM. Overloaded circuits: why smart people underperform. Harv Bus Rev. 2005 Jan;83(1):54-62, 116.

Mobile phone use and motor vehicle accidents

- Driver's use of a mobile phone within 5 min before a crash associated with fourfold increased likelihood of crashing (OR 4.1)
  - McEvoy SP, Stevenson MR, Woodward M.The contribution of passengers versus mobile phone use to motor vehicle crashes resulting in hospital attendance by the driver. Accid Anal Prev. 2007 Nov;39(6):1170-6. Epub 2007 Apr 9.
- Texting / emailing / internet while driving increased the risk 164-fold
  - Hickman JS, Hanowski RJAn assessment of commercial motor vehicle driver distraction using naturalistic driving data. Traffic Inj Prev. 2012;13(6):612-9. doi: 10.1080/15389588.2012.683841.

Multitasking

- “In 2005, the BBC reported on a research study, funded by Hewlett-Packard, and conducted by the Institute of Psychiatry at the University of London, that found, workers distracted by e-mail and phone calls suffer a fall in IQ more than twice that found in marijuana smokers.”
  - Christine Rosen, “The Myth of Multitasking.” The New Atlantis thenewatlantis.com. Spring 2008. Web. 14 Apr. 2011.

Multitasking or task-switching?

- Multitasking is an illusion (misnomer)
- Switching happens so fast that it appears we are performing multiple tasks simultaneously like the concurrent performance of several jobs by a computer
- Reality is that we are switching back and forth between tasks
  - http://ucsdcfm.wordpress.com/2011/07/01/our-brains-are-evolving-to-multitask-not-the-ill-usion-of-multitasking/

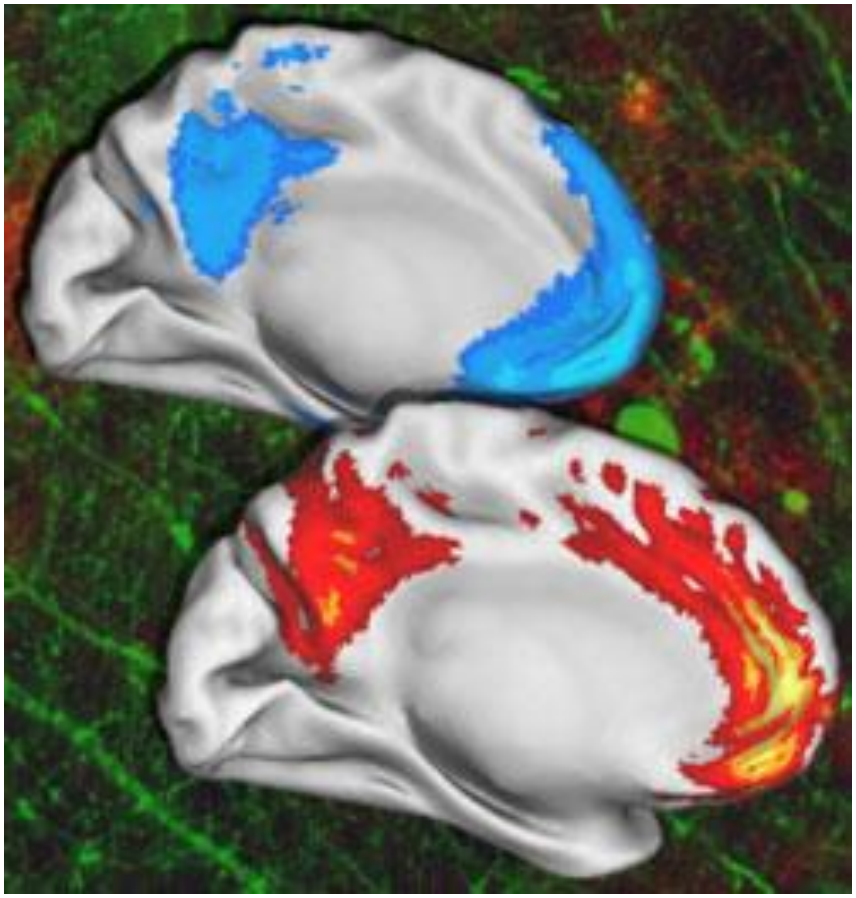
The Illusion Of Multitasking

Average of **64 seconds** to **recover train of thought** after checking **email**

- Check **every 5 mins** = waste **8.5 hours per week**

Jackson, Dawson & Wilson. (2002)

The Default Brain



- Active tasks
  - Tasks associated with paying attention
  - Brain efficient and quiet
- Default state (mode)
  - Mind is inattentive, distracted, idle, recalling past, daydreaming
  - Areas active in default mode similar to areas affected by Alzheimer's Disease

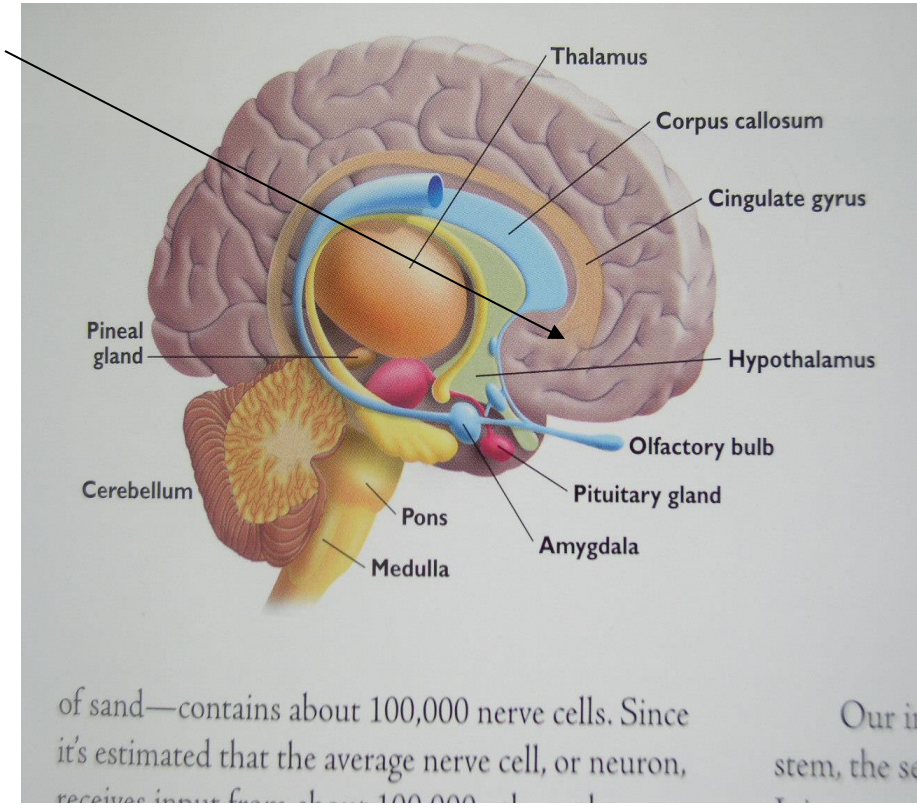
The Default Brain

Associated with

- Stress (Brewer et al., 2011)
- Anxiety (Zhao et al., 2007)
- Depression (Greicius et al., 2007)
- ADHD (Uddin et al., 2008a)
- Schizophrenia (Pomarol-Clotet et al., 2008)
- Autism (Kennedy & Courchesne, 2008)
- Alzheimer's dementia (Firbank et al., 2007)
- Criminal recidivism (Aharoni et al., 2013)
- Reduced performance (Brewer et al., 2011)

Three regions of the brain

- Frontal lobes (prefrontal cortex) centre for executive functioning
  - Attention regulation
  - Self-awareness
  - Working memory
  - Reasoning and decision making
  - Emotional regulation
  - Appetite regulation
  - Impulse control
  - Directs immune system
- Limbic system – emotion centre
- Mesolimbic reward system – appetites



- “The faculty of voluntarily bringing back a wandering attention over and over again, is the very root of judgment, character, and will. No one is compos sui if he have it not. An education which should improve this faculty would be the education par excellence.”
  - William James, Principles of Psychology, 1890

Mindfulness and attention regulation

- Mindfulness involves **attention** and **attitude**
- Attention regulation has three aspects

1. To know where our attention is
2. To prioritise where the attention needs to be
3. For the attention to go there and stay there

- Mindful attitude

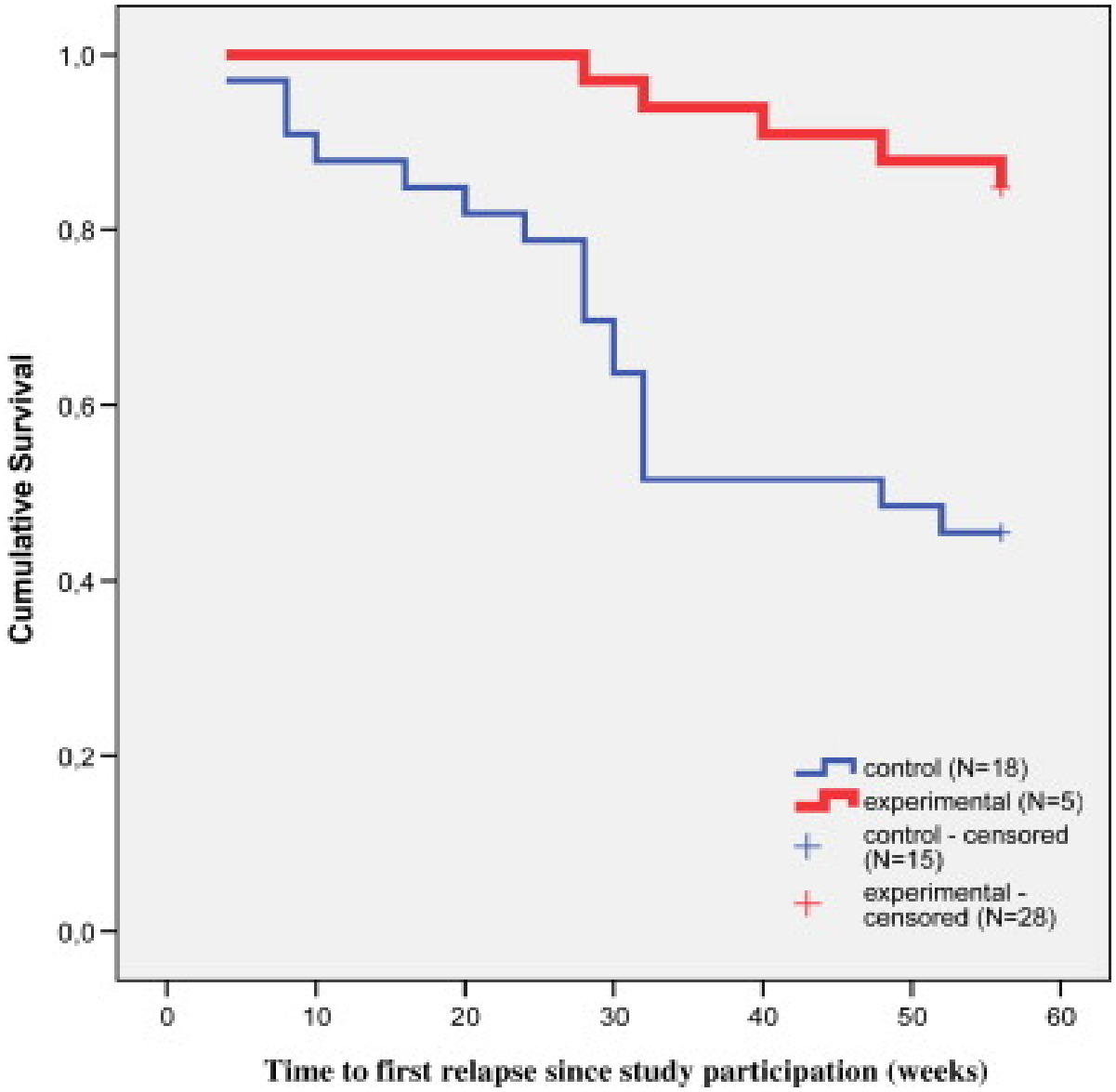
1. Openness and curiosity
2. Acceptance
3. Compassion

Applications of mindfulness

- **Mental health:** E.g. therapeutic for depression, anxiety, panic disorder, stress, emotional regulation, addiction, sleep problems, eating disorders, psychosis, ADHD, autism, reduced burnout
- **Neuroscience:** E.g. structural and functional changes in the brain, neurogenesis, (dementia prevention), down-regulating the amygdala, improved executive functioning and working memory, reduced default mental activity, improved self-monitoring and cognitive control
- **Clinical:** E.g. pain management, symptom control, coping with chronic illness, metabolic and hormonal benefits, facilitating lifestyle change (e.g. weight management, smoking cessation), improved immunity, enhanced genetic function and repair
- **Performance:** E.g. sport, academic, leadership, mental flexibility
- **Education:** E.g. improved problem-solving, improved executive functioning and working memory, focus, better behaviour
- **Relationships:** E.g. emotional intelligence, communication, empathy
- **Spiritual**

MBCT and depression

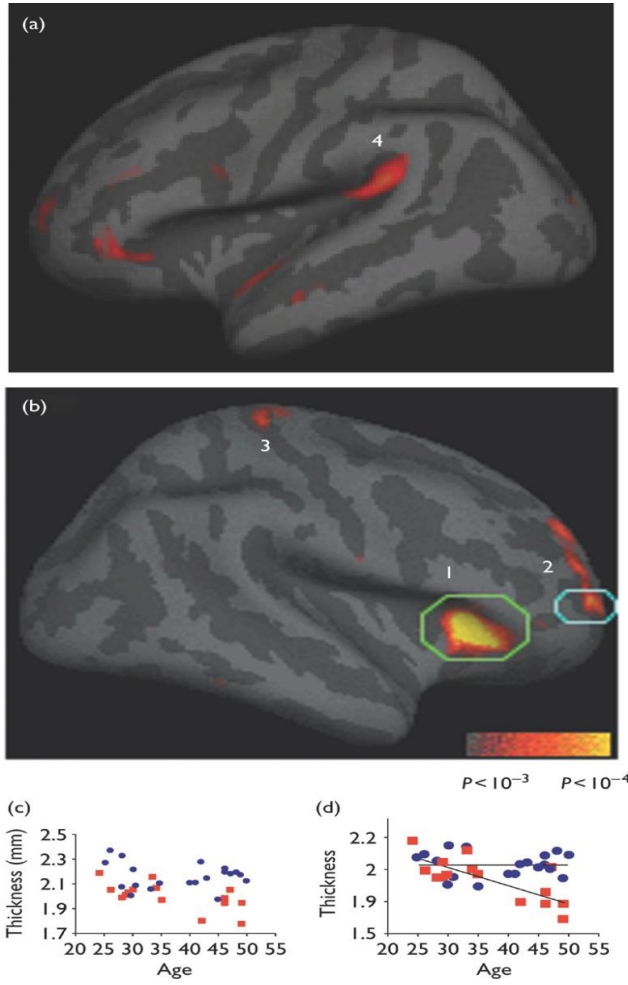
- RCT investigated the effects of Mindfulness-based cognitive therapy (MBCT) on the relapse in depression, time to first relapse and the quality of life
  - 106 recovered depressed patients with a history of at least 3 depressive episodes
  - Treatment as usual (TAU) vs MBCT plus TAU 1 year f/up
- Relapse/recurrence significantly reduced and the time until first relapse increased in the MBCT plus TAU c/w TAU
- MBCT plus TAU group also showed a significant reduction in both short and longer-term depressive mood, better mood states and quality of the life
  - Godfrin KA, van Heeringen C. The effects of mindfulness-based cognitive therapy on recurrence of depressive episodes, mental health and quality of life: A randomized controlled study. Behav Res Ther. 2010 Aug;48(8):738-46.



Godfrin KA, van Heeringen C. Behav Res Ther. 2010 Aug;48(8):738-46.

Mindfulness and the brain

- Mindfulness training improves functioning in areas related to executive functioning, attentional control, self-regulation, sensory processing, memory and regulation of the stress response
  - Thickening of cortex in regions associated with attention, self-awareness and sensory processing thicker in meditators
  - "The regular practice of meditation may have neuroprotective effects and reduce the cognitive decline associated with normal aging."
    - Hölzel BK, Carmody J, Evans KC, et al. Stress reduction correlates with structural changes in the amygdala. Soc Cogn Affect Neurosci. 2010 Mar;5(1):11-7.
    - Hölzel BK, Carmody J, Vangel M, et al. Mindfulness practice leads to increases in regional brain gray matter density. Psychiatry Res. 2011 Jan 30;191(1):36-43.
    - Kilpatrick LA, Suyenobu BY, Smith SR, et al. Impact of Mindfulness-Based Stress Reduction training on intrinsic brain connectivity. Neuroimage. 2011 May 1;56(1):290-8.
    - Lazar SW, Kerr CE, Wasserman RH, et al. Neuroreport. 2005;16(17):1893-1897.
    - Pagnoni G. Cekic M. Neurobiology of Aging. 2007;28(10):1623-7.



Roots of Diagnostic Errors

- Confirmation bias: the pursuit of data that support a diagnosis over data that refute it
- Anchoring bias: a resistance to adapting appropriately to subsequent data that suggest alternative diagnoses
  - Sibinga EM, Wu AW. Clinical Mindfulness and Patient Safety. JAMA 2010;304(22):2532-3.

Mindfulness and mental flexibility

- Mindfulness leads to:
  - reduced cognitive rigidity via the tendency to be "blinded" by experience
  - “a reduced tendency to overlook novel and adaptive ways of responding due to past experience, both in and out of the clinical setting.”
    - Greenberg J, Reiner K, Meiran N. "Mind the trap": mindfulness practice reduces cognitive rigidity. PLoS One. 2012;7(5):e36206. Epub 2012 May 15.

Mindfulness and practitioner wellbeing

- An 8-week mindfulness program: improvements on all measures of wellbeing including:
  - Mindfulness
  - Burnout (emotional exhaustion; depersonalization; personal accomplishment)
  - Empathy and responsiveness to psychosocial aspects
  - Total mood disturbance
  - Personality (conscientiousness; emotional stability)
- Improvements in mindfulness correlated with improvements on other scales
  - Krasner MS, Epstein RM, Beckman H, et al. JAMA. 2009;302(12):1338-40.

Mindfulness, management and work

- Randomized study of the effect of mindfulness on senior managers
- Mindfulness enhanced participants' self-perception of leadership skills as a bundle of all five skills, and some individual skills
  - Amar AD, Hlupic V, Tamwatin T. Effect of meditation on self-perception of leadership skills: a controlled group study of CEOs. 10.5465/AMBPP.2014.300 ACAD MANAGE PROC January 2014
- People higher in mindfulness less likely to feel need frustration, even in unsupportive managerial environments: a protective factor in controlling work environments
  - Schultz PP, Ryan RM, Niemiec CP, Legate N, Williams GC. Mindfulness, Work Climate, and Psychological Need Satisfaction in Employee Well-being. Mindfulness September 25, 2014.
- Mindfulness intervention group had significant decrease in perceived stress but increased mindfulness, resiliency, and vigour
  - Aikens KA, Astin J, Pelletier KR, et al. Mindfulness Goes to Work: Impact of an Online Workplace Intervention. Journal of Occupational & Environmental Medicine. July 2014;56(7):721–731. doi: 10.1097/JOM.0000000000000209

Emotional Intelligence & mindfulness

- Mindfulness related to aspects of personality and mental health
  - Lower neuroticism, psychological symptoms, experiential avoidance, dissociation
  - Higher emotional intelligence and absorption
    - Baer RA, et al. Assessment. 2004;11(3):191-206.

EI	Definition
Self-awareness	Ability to recognise and understand emotions, drives and effects
Self-regulation	Can control or redirect disruptive impulses, can think before acting
Motivation	Passion for work that goes beyond money or status, energy and persistence
Empathy	Ability to understand emotions of others, skill in interacting with others
Social skill	Can manage relationships and build networks, can find common ground, rapport

Mindfulness and communication

- Observational study of clinicians caring for patients
- Measured patient-clinician communication quality and patient ratings
- Comparing clinicians with highest and lowest mindfulness scores: high-mindfulness clinician consultations:
  - Patient-centered pattern of communication (OR 4.14)
  - Engaged in more rapport building and discussion of psychosocial issues
  - Displayed more positive emotional tone with patients
  - Patients more likely to give high ratings on clinician communication and to report high overall satisfaction
    - Beach MC, Roter D, Korthuis PT, Epstein RM, et al. A Multicenter Study of Physician Mindfulness and Health Care Quality doi: 10.1370/afm.1507 Ann Fam Med 2013;11(5):421-428.

Meditation, compassion & carer fatigue

- Vicarious stress: stress brain regions implicated in empathic response to another's pain
- Meditators have more active empathic response but not a stress response
- Empathy w/o stress reduces carer fatigue and burnout
  - Lutz A, Brefczynski-Lewis J, Johnstone T, Davidson RJ. PLoS ONE. 2008 Mar 26;3(3):e1897.

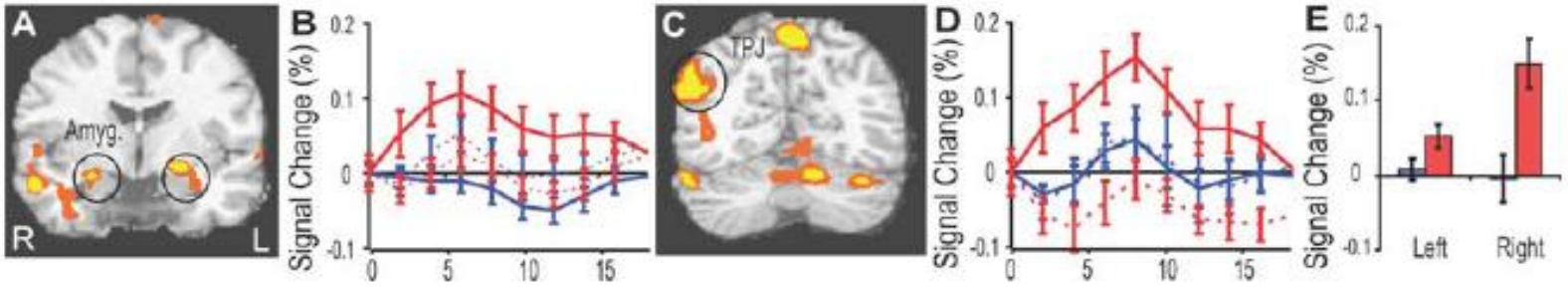


Figure 3. State by Group Interaction: A. (Amyg.) stands for amygdala (y = −5, color codes: orange, p<2.10^-3, yellow, p<5.10^-4). **B.** Impulse response in (Amyg.) for 15 experts (red) and for 15 novices (blue) during rest (dashed line) and compassion (full line). **C–D.** Same as **A–B** in TPJ; y = −61. **E.** Side by state effect and side by state by group effect in TPJ on the average impulse response between meditation and rest; experts are in red, novices in blue.

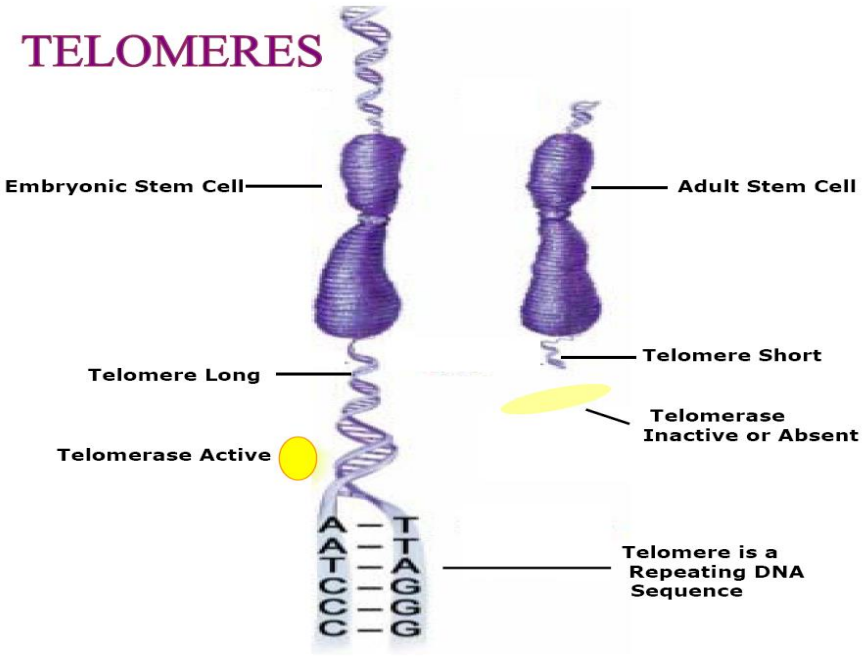
doi:10.1371/journal.pone.0001897.g003

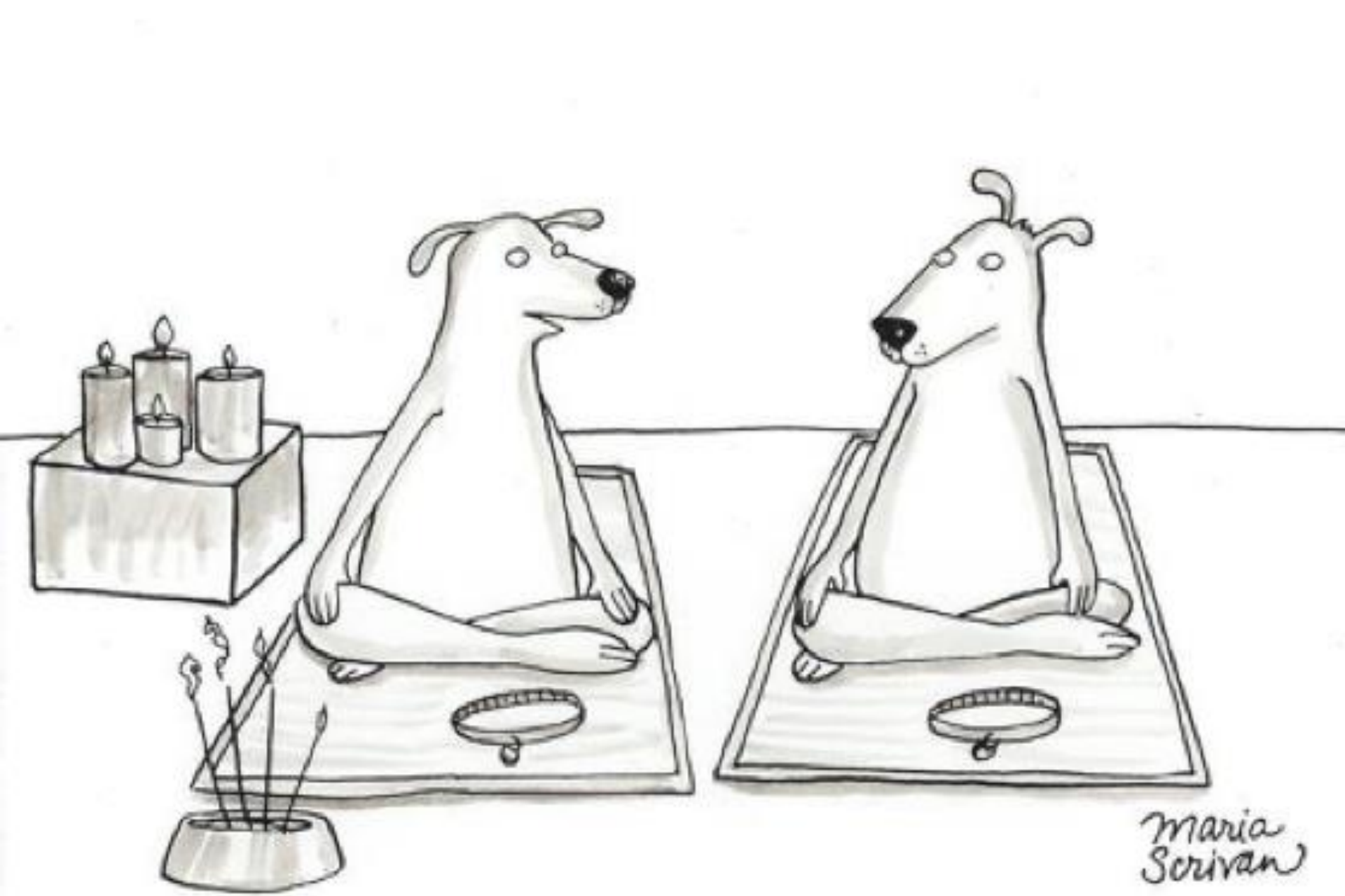
Mindfulness, exercise & the cold

- RCT evaluating effects of meditation or exercise on incidence, duration, and severity of acute respiratory infection (ARI)
- Adults >50 years randomized to 1 of 3 study groups:
  - 8-week training in mindfulness meditation,
  - 8-week training in moderate-intensity sustained exercise
  - control (no intervention)
    - Barrett B, Hayney MS, Muller D, et al. Meditation or Exercise for Preventing Acute Respiratory Infection: A Randomized Controlled Trial. Ann Fam Med 2012 10:298-299.
- ARIs and days of illness:
  - Control group: 40 ARIs and 453 illness days
  - Exercise group: 26 ARIs and 241 illness days
  - Meditation group: 27 ARIs and 257 days of ARI illness
- ARI symptom severity
  - 358 for control
  - 248 for exercise
  - 144 for meditation
- Days off work
  - 67 missed in the control group
  - 32 in the exercise group
  - 16 in the meditation group

Mindfulness and cellular ageing

- Meditation may slow genetic ageing and enhance genetic repair
  - "...we propose that some forms of meditation may have salutary effects on telomere length by reducing cognitive stress and stress arousal and increasing positive states of mind and hormonal factors that may promote telomere maintenance."
    - Epel E, Daubenmier J, Moskowitz JT, Folkman S, Blackburn E. Can meditation slow rate of cellular aging? Cognitive stress, mindfulness, and telomeres. Ann N Y Acad Sci. 2009 Aug;1172:34-53.





"The key to meditation is learning to stay."

Applying mindfulness in the workplace

- Formal practice
  - 5-10 minutes to be taken seated b.d. before meals
  - 15-60 seconds p.r.n.
- Informal practice
  - Pay attention to the present moment
  - The senses are a gateway to the present moment whether listening, eating, walking, reading, doing a procedure…
  - Move through your day one step / moment / job at a time
  - Avoid multitasking
- Cultivate a mindful attitude
  - E.g. open, curious, flexible, non-attached…
  - Do things in non-habitual ways
  - Look for novelty / differences
- Mindfulness-based cognitive practices
  - Perception
  - Letting go
  - Acceptance
  - Presence of mind

The Mindful Lawyer

- http://greatergood.berkeley.edu/article/item/mindful_lawyering

co-author of the bestselling *Mindfulness for Life*

DR CRAIG HASSED
& DR RICHARD CHAMBERS

mindful learning

Reduce stress and improve brain performance for effective learning

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Foreword by Ian Gawler OAM

mindfulness FOR LIFE