Mindfulness for Wellbeing, Resilience and Sustainable Performance

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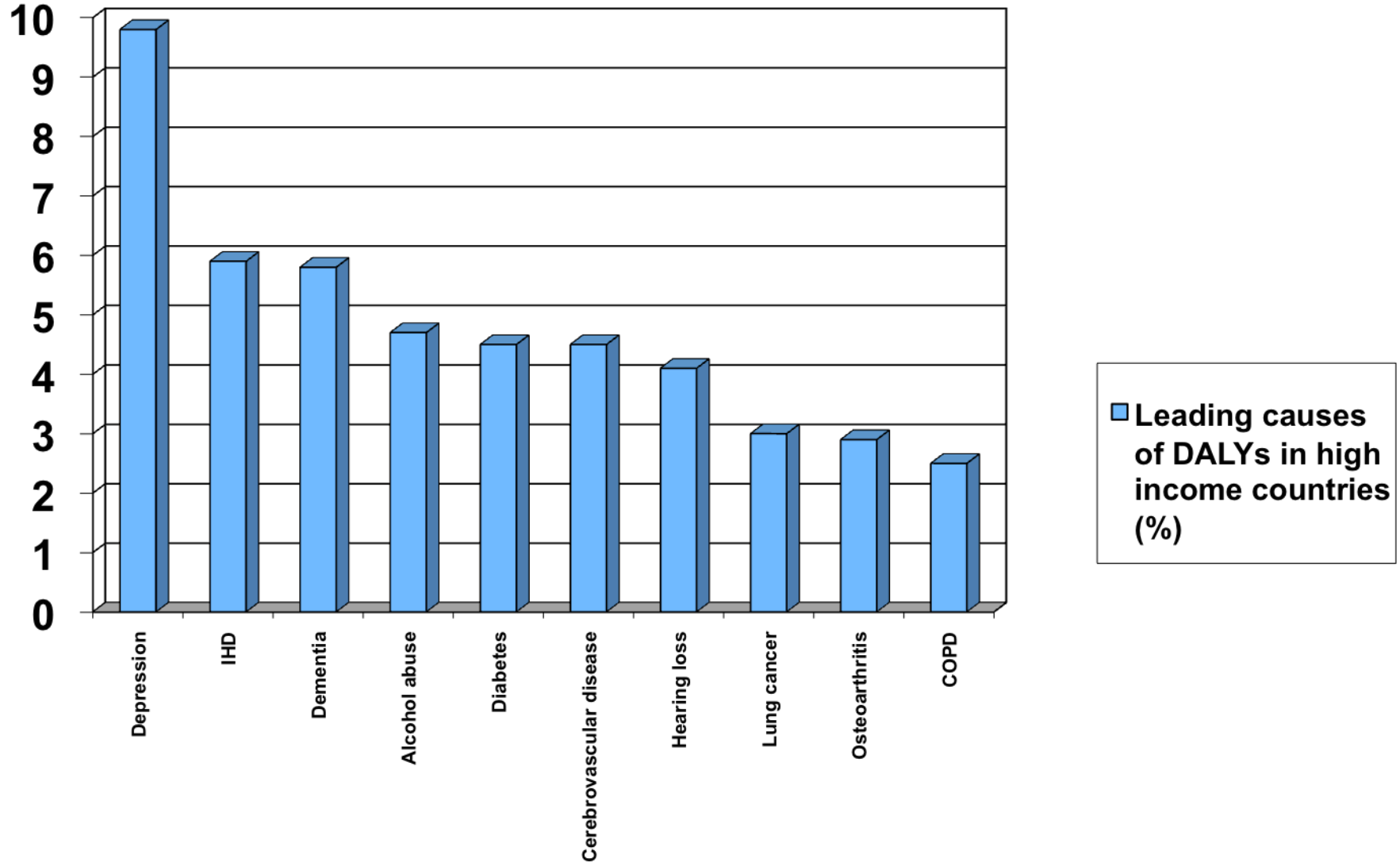
Mind wandering and happiness

- “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

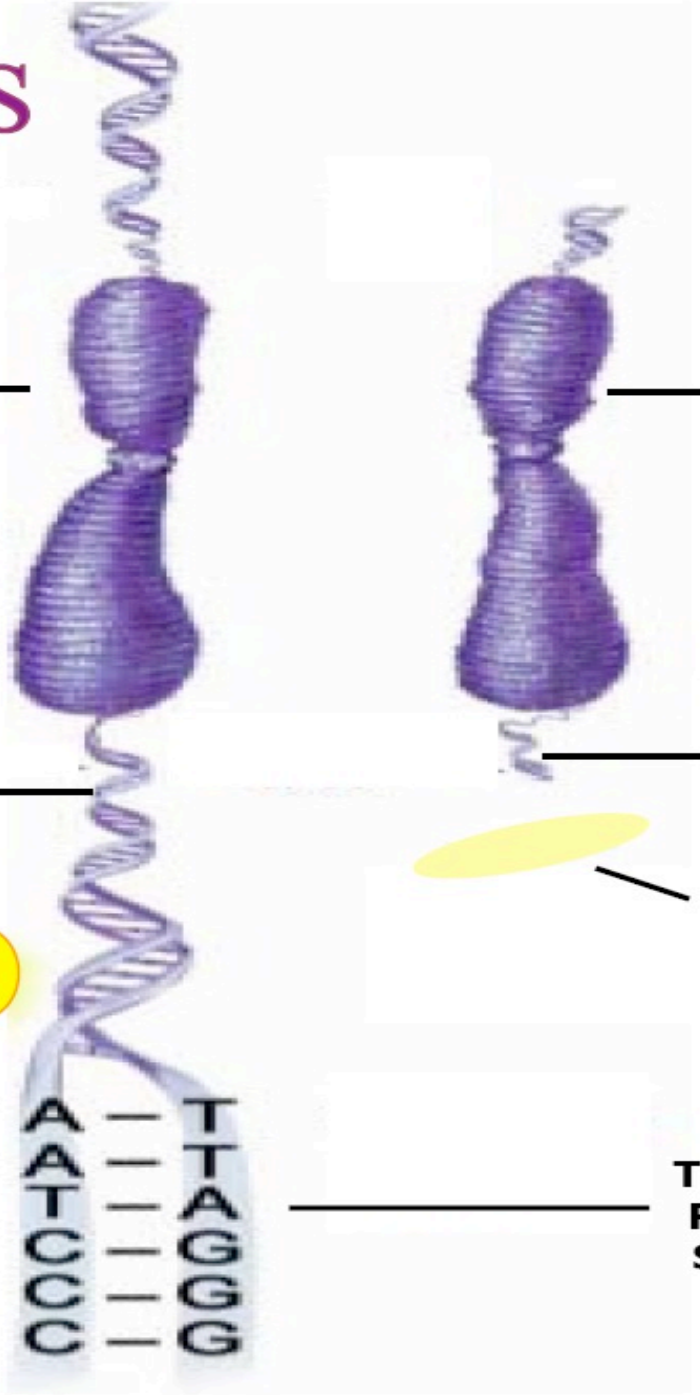


Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. PLoS Med. 2006 Nov;3(11):e442.

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.

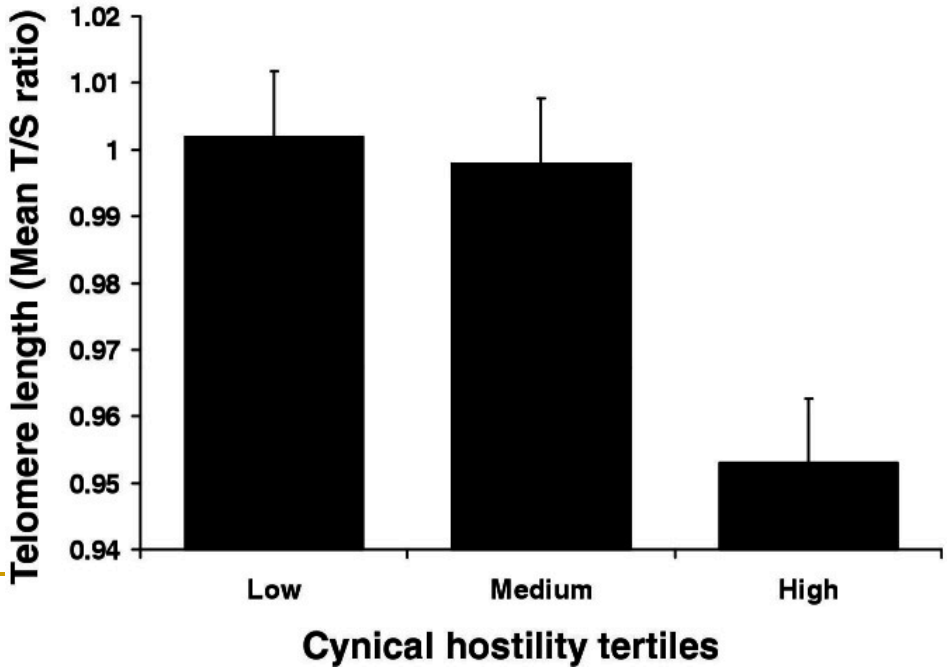
TELOMERES


Embryonic Stem Cell
Adult Stem Cell
Telomere Short
Telomere Long
Telomerase Inactive or Absent
Telomerase Active
AATCCC
TTAGGG
Telomere is a Repeating DNA Sequence

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.



Mind wandering and ageing

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

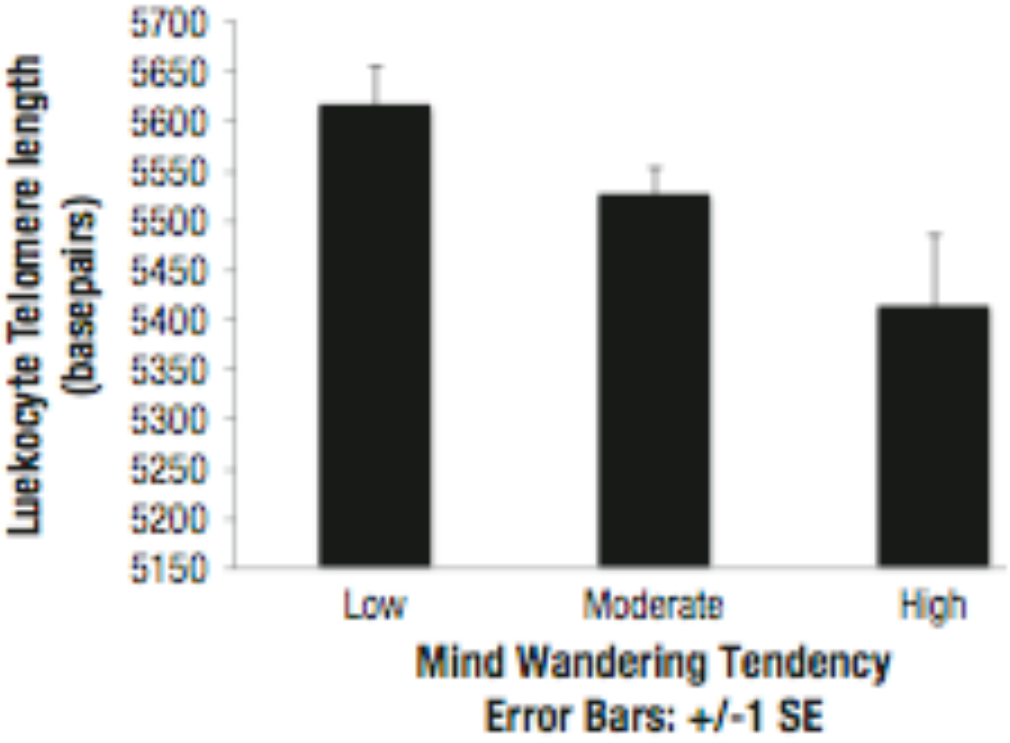


Fig. 1. Leukocyte telomere length by greater mind-wandering group.

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

Falling attention spans

- According to a Microsoft Canada report, the average human's attention span is below that of a goldfish (8 sec vs. 9 sec)
- "We are moving from a world where computing power was scarce to a place where it now is almost limitless, and where the true scarce commodity is increasingly human attention"
  - Satya Nadella
    - file:///Users/craighassed/Downloads/microsoft-attention-spans-research-report.pdf

Overloaded circuits

- “Bain and Company, the consultancy, has estimated that executives in the 1970s had to deal with fewer than 1,000 phone calls, telexes and telegraphs a year from people outside their company. These days, 30,000 external communications clog managers’ inboxes annually. As Henry Mintzberg asks in his 2009 book, *Managing*: “Might the internet, by giving the illusion of control, in fact be robbing managers of control? In other words, are the ostensible conductors becoming more like puppets?”
  - Financial Times, UK March 5, 2016.

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 RJ. An 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 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/

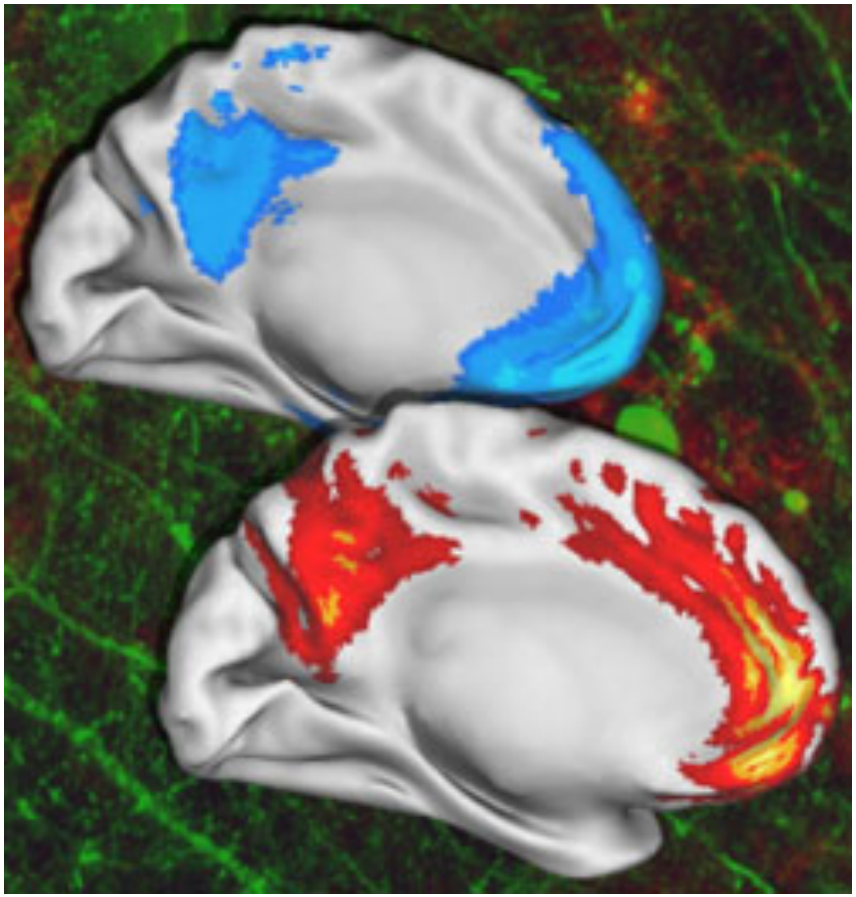
The Illusion Of Multitasking

- **Attention switching**
  - So fast it *appears* we are doing multiple things simultaneously
- **Attentional blink**
  - **Lag time** of 200 to 500 milliseconds (0.5 second)
  - Increased by **stress**
    - Slatger, Lutz, Greishchar et al. (2007)

Interrupting the flow

- 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



- Focused: on-task
  - Tasks associated with paying attention
  - Brain efficient and quiet
- Default state (mode)
  - Mind is inattentive, distracted, idle, recalling past, daydreaming
  - Operating on automatic pilot

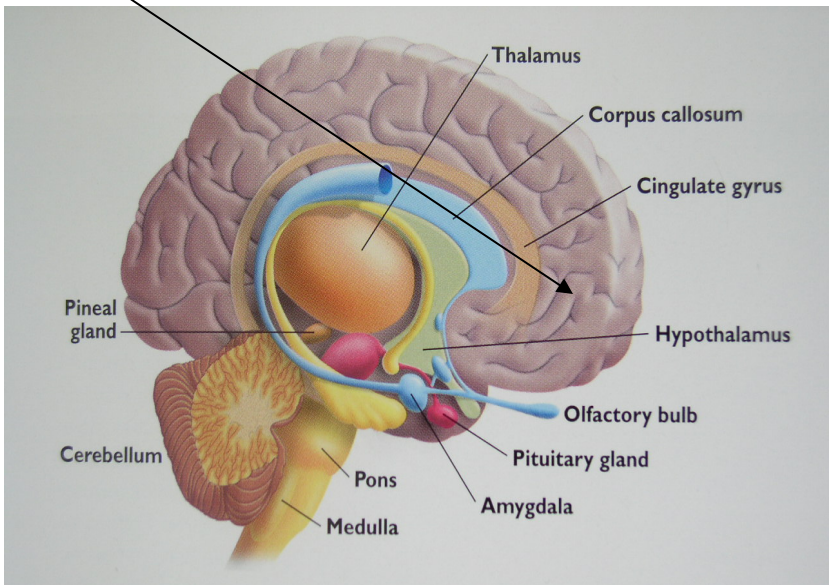
The Default Brain

Associated with

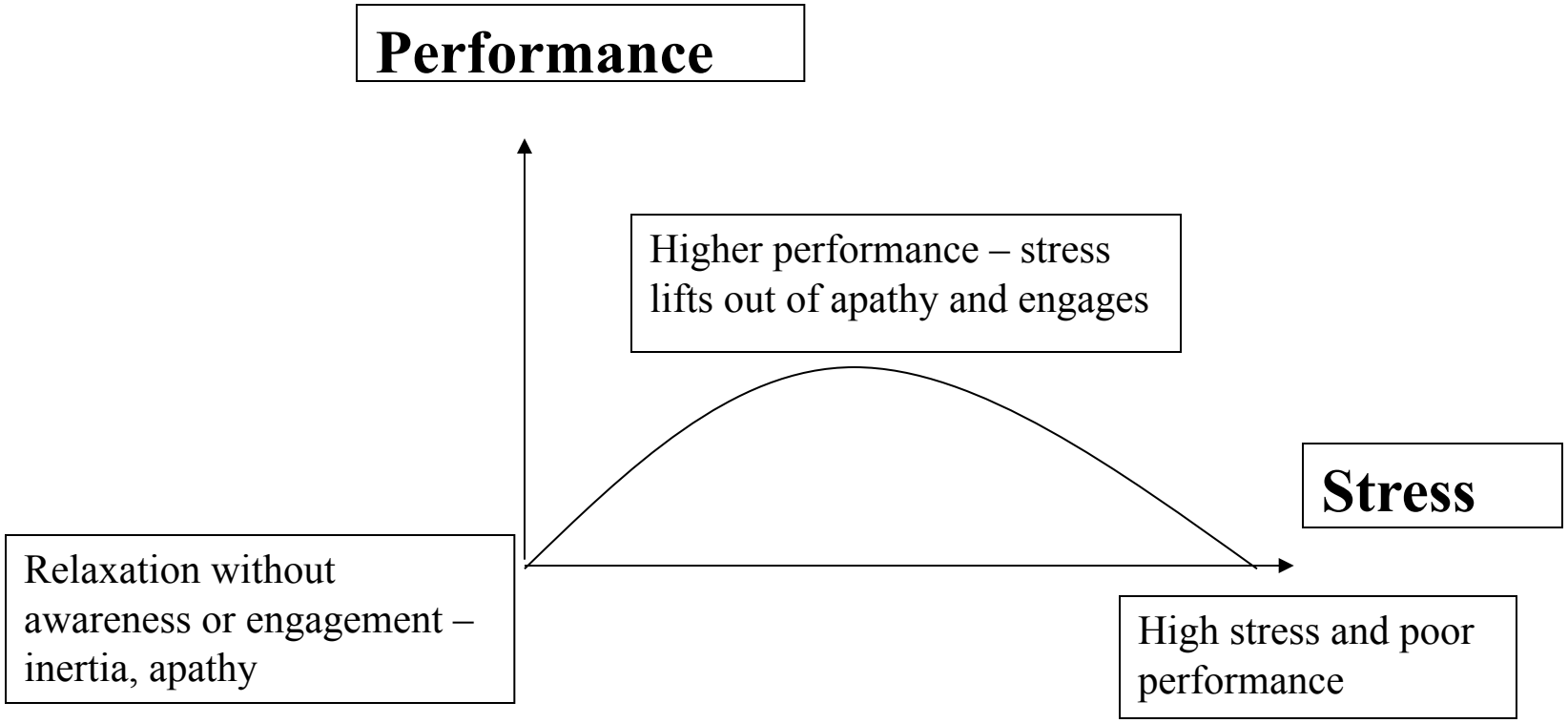
- Stress (Brewer et al., 2011)
- Anxiety (Zhao et al., 2007)
- Depression (Greicius et al., 2007)
- ADHD (Uddin et al., 2008a)
- Schizophrenia (Pomarol-Clotet et al., 2008)
- Autism (Kennedy & Courchesne, 2008)
- Alzheimer's dementia (Firbank et al., 2007)
- Criminal recidivism (Aharoni et al., 2013)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

Executive functioning

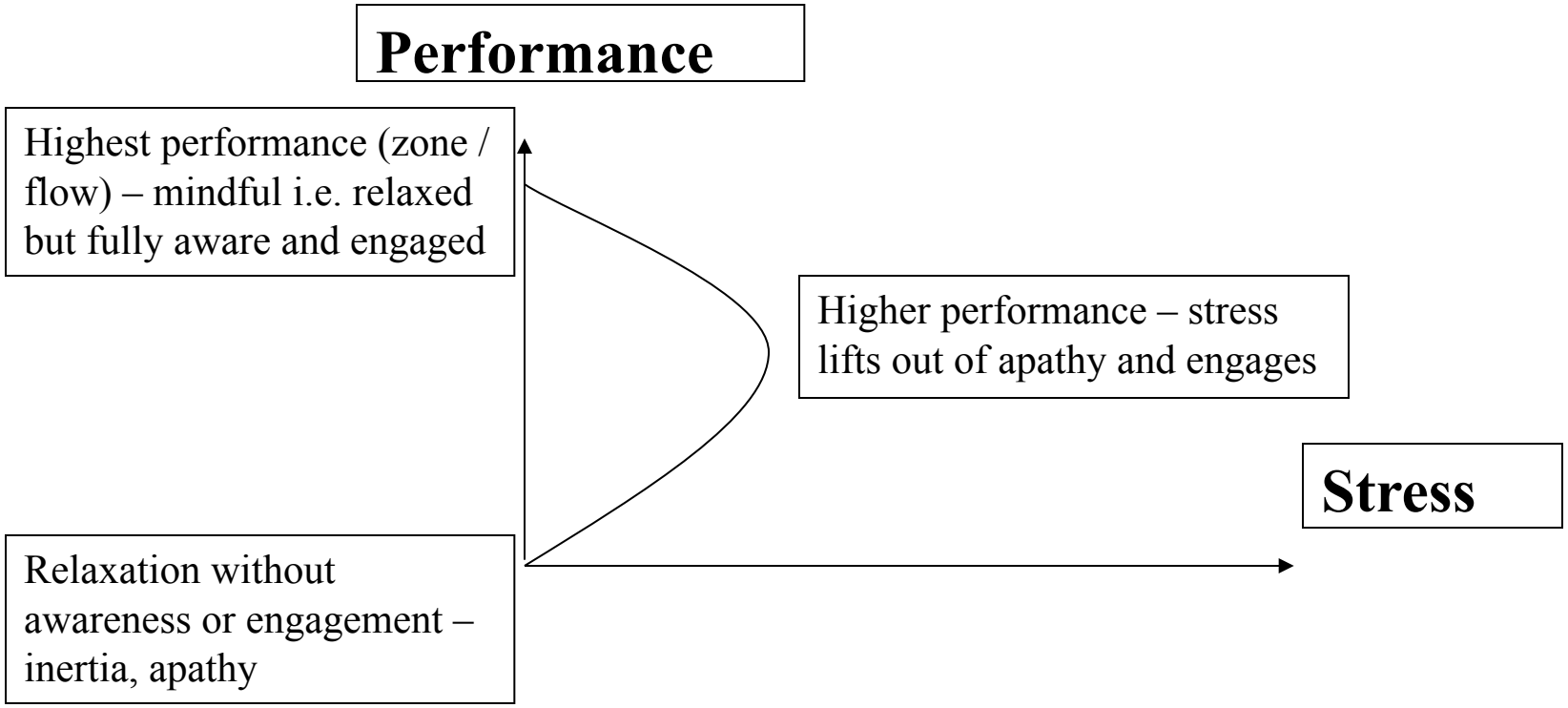
- Frontal lobes (prefrontal cortex) centre for executive functioning
  - Attention regulation
  - Self-awareness
  - Working memory
  - Reasoning
  - Decision making
  - Emotional regulation
  - Appetite regulation
  - Impulse control
- Meant to regulate other brain regions e.g.
  - Limbic system – emotion centre
  - Mesolimbic reward system – appetites



Yerkes-Dodson Stress-performance curve



Hassed / mindfulness stress-performance curve



- “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

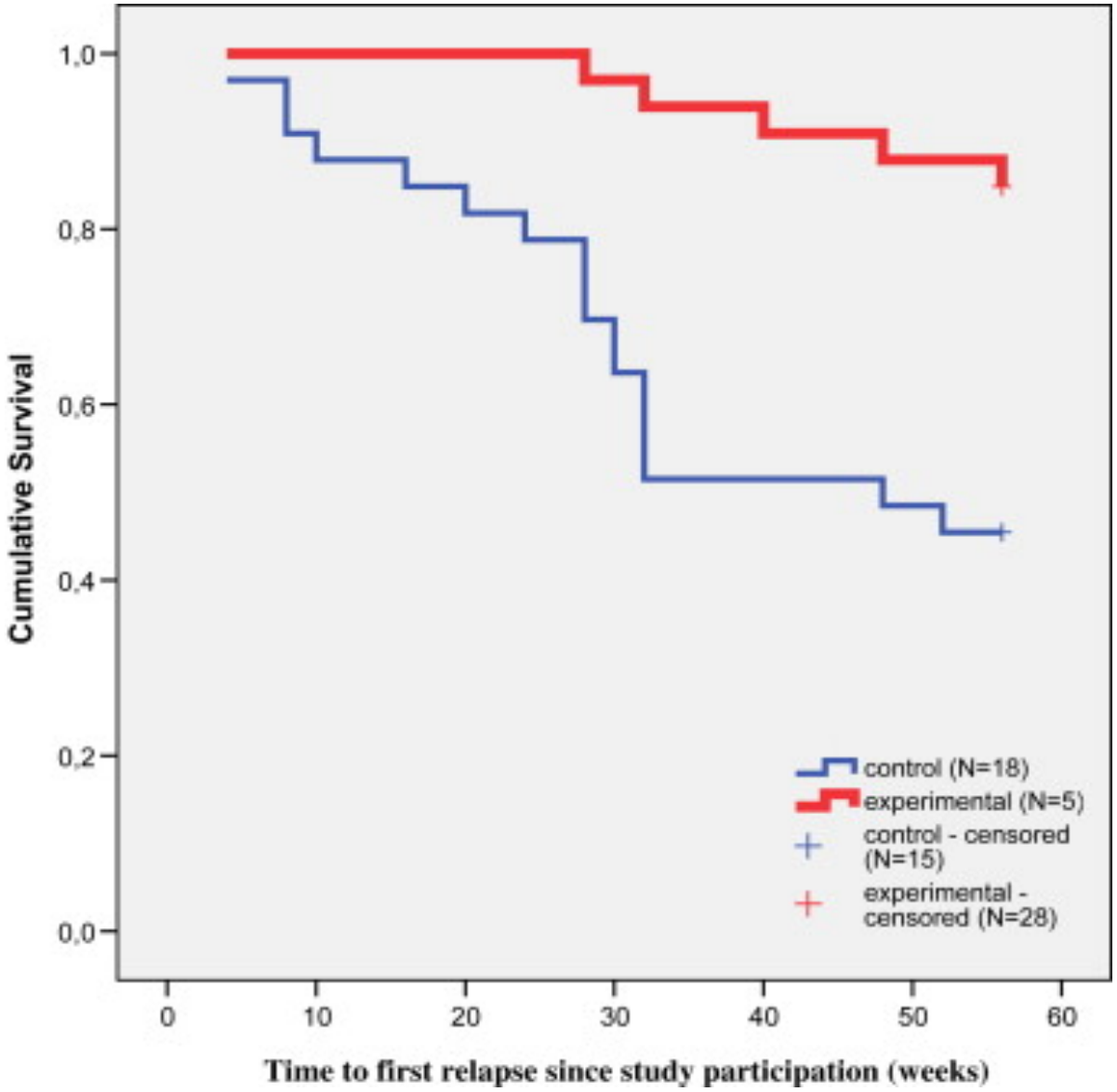
1. Openness
2. Curiosity
3. Acceptance
4. Self-compassion

Applications of mindfulness

- **Mental health:** E.g. therapeutic application for depression, anxiety, panic disorder, stress, emotional regulation, addiction, sleep problems, eating disorders, psychosis, ADHD, autism, reduced burnout, greater resilience
- **Neuroscience:** E.g. structural and functional changes in the brain, stimulation of neurogenesis, possible prevention of dementia and cognitive decline, down-regulating the amygdala, improved executive functioning and working memory, reduced default mental activity, improved self-monitoring and cognitive control, improved perception of sensory input
- **Clinical:** E.g. therapeutic applications for pain management, symptom control, coping with chronic illness (e.g. cancer and MS), metabolic and hormonal benefits (e.g. reduced allostatic load, cortisol), facilitating lifestyle change (e.g. weight management, smoking cessation), improved immunity (e.g. improved resistance, reduced inflammation), improved genetic function and repair, slower ageing as measured by telomeres
- **Performance:** E.g. sport, academic, leadership qualities, mental flexibility and problem solving, decision-making, sunk-cost bias
- **Education:** E.g. improved problem-solving, executive functioning and working memory, better focus, less behavioural problems, fostering growth mindsets
- **Relationships:** E.g. greater emotional intelligence and empathy, improved communication, reduced vicarious stress and carer burnout
- **Spiritual**

MBCT and depression

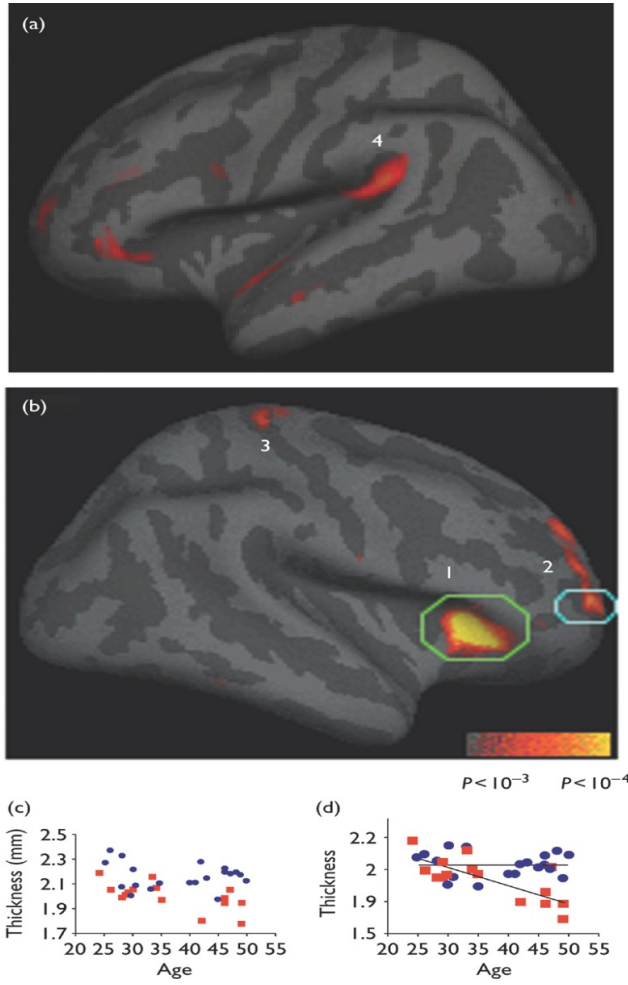
- RCT investigated the effects of Mindfulness-based cognitive therapy (MBCT) on the relapse in depression, time to first relapse and the quality of life
  - 106 recovered depressed patients with a history of at least 3 depressive episodes
  - Treatment as usual (TAU) vs MBCT plus TAU 1 year f/up
- Relapse/recurrence 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.



Default mode network

- High default mental activity in psychopathology (e.g. depression, anxiety, schizophrenia and autism)
- Default activity decreased or deactivated when paying attention (e.g. experienced mindfulness meditators)
- In experienced meditators even when default network active, regions associated with self-monitoring and cognitive control are co-activated: reduced vulnerability to default thinking
  - Brewer JA, Worhunsky PD, Gray JR, et al. Meditation experience is associated with differences in default mode network activity and connectivity. Proc Natl Acad Sci U S A. 2011 Dec 13;108(50):20254-9.

Roots of Decision 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 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.

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 the workplace

- 8 week mindfulness program for ANU staff
- Key findings include:
  - Increased self-rated performance (ECDP)
  - Improved wellbeing (PANAS)
  - Improved eudaimonic wellbeing (meaningfulness) (PWB)
  - Increase in work engagement (vigour and dedication) (UWES)
  - Increased authenticity (self-awareness, authentic behaviour, open relationships) (AI3)
  - Increased satisfaction with life (SWLS)
- Improvements sustained at 6 month f/up
  - Atkins PWB, Hassed C, Fogliati VJ. (2015) Mindfulness Improves Work Engagement, Wellbeing and Performance in a University Setting. In Burke, RJ, Cooper, CL & Page, KM. Flourishing in Life, Work, and Careers, pp 193-209. Elgar, Cheltenham.

Mindfulness, management and work

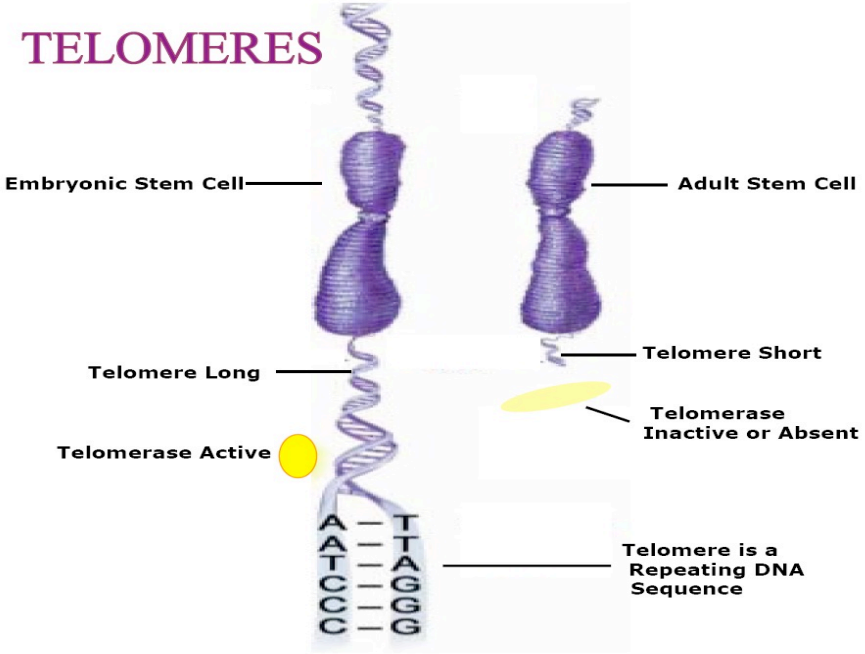
- People higher in mindfulness less likely to feel frustration, even in unsupportive managerial environments: a protective factor in controlling work environments
  - Schultz PP, Ryan RM, Niemiec CP, Legate N, Williams GC. Mindfulness, Work Climate, and Psychological Need Satisfaction in Employee Well-being. 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

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.



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

Free 6-week online mindfulness course

- https://www.futurelearn.com/courses/mindfulness-wellbeing-performance
- Collaboration between Monash University and FutureLearn (UK)

Resources

- The Mindful Lawyer
  - http://greatergood.berkeley.edu/article/item/mindful_lawyering
- On-line mindfulness course
  - https://www.futurelearn.com/courses/mindfulness-wellbeing-performance