Mindfulness for resilience, wellbeing and sustainable performance

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Which of the following is associated with greatest self-reported happiness?

A. Mind wandering to unpleasant topics
B. Mind wandering to neutral topics
C. Mind wandering to pleasant topics
D. Mind not wandering from what one is currently doing

Answer D
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.”

“And now Edgar’s gone. . . . Something’s going on around here.”
'I think you should be more explicit here in step two.'
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
**Stress and telomere shortening**

- Study on healthy premenopausal women showed that psychological stress associated with:
  - higher oxidative stress
  - lower telomerase activity (telomerase repairs DNA telomeres) leading to shorter telomere length
- These are known determinants of cell death/longevity
- Women with highest levels of perceived stress c/w low stress women have shorter telomeres
  - Average equivalent at least 9-17 years of additional ageing
- Implications for how, at the cellular level, stress may promote earlier onset of age-related diseases
“Bedtime, Leroy. Here comes your animal blanket.”
Mind wandering and ageing

- Study on association between telomere length and tendency to be present vs. tendency to mind wander in 239 healthy women
- Those reporting high mind wandering had shorter telomeres than those who reported low mind wandering (adjusted for stress)
- “A present attentional state may promote a healthy biochemical milieu and, in turn, cell longevity.”
Mind wandering and ageing

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

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
“Any man who can drive safely while kissing a pretty girl is simply not giving the kiss the attention it deserves.”
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)
“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.”

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
This time I won't screw up! I won't, I won't, I won't...

Roger screws up.
Three regions of the brain

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

- 1000
- 40
- 1000
- 30
- 1000
- 20
- 1000
- 10

- The first law of performance is to pay attention: beware of automatic pilot
Attention regulation

- 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
Doctor health and medical errors

- Study determined prevalence of depression and burnout among residents medical staff in 3 US hospitals
- 20% of residents met criteria for depression
- 74% met the criteria for burnout
- Depressed residents made 6.2 times as many medication errors as residents who were not depressed
  
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
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

What is mindfulness?

“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
Applications of mindfulness

- **Mental health**
  - E.g. depression relapse prevention, anxiety, panic disorder, stress, emotional regulation, addiction, sleep, eating disorders, psychosis

- **Neuroscience**
  - E.g. structural and functional changes in the brain, neurogenesis, (dementia prevention) amygdala, executive function, working memory

- **Clinical**
  - E.g. pain management, symptom control, cancer, metabolic, hormonal, weight management, genetic function and repair

- **Performance**
  - E.g. sport, academic, leadership

- **Spiritual**

Results suggest that MBSR may help a broad range of individuals to cope with their clinical and non-clinical problems. Grossman P. J Psychosomatic Research. 2004;57(1):35-43.
There are not too many people in the world right now, Gladys, who can go home at the end of the day happy in the knowledge that everything is completely stuffed.
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
Mindfulness, adolescents and mental health

- “Mindfulness-based stress reduction (MBSR) program for adolescents age 14 to 18 years with heterogeneous diagnoses in an outpatient psychiatric facility.

- Relative to treatment-as-usual control participants, those receiving MBSR self-reported reduced symptoms of anxiety, depression, and somatic distress, and increased self-esteem and sleep quality.”

  
  http://dx.doi.org/10.1037/a0016241
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.”

"Wait a minute here, Mr. Crumbley. ... Maybe it isn’t kidney stones after all."
Essence program and student wellbeing

- Study of 2006 cohort of medical students found that 90.5% of students personally applied strategies

- Improved student wellbeing noted on all measures of wellbeing even in the pre-exam period
  - Reduced depression, hostility and anxiety subscale
  - Improved psychological and physical quality of life

Mindfulness and cognition

- Study on brief meditation training effects on cognition and mood
- Four sessions of either meditation training
- Participants were assessed with measures of mood, verbal fluency, visual coding, and working memory
- Mindfulness training improved mindfulness, mood, and reduced fatigue, anxiety, and increased visuo-spatial processing, working memory, and executive functioning

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.”
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)


- 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
“Now relax. ... Just like last week, I’m going to hold the cape up for the count of 10. ... When you start getting angry, I’ll put it down.”
Emotional Intelligence & mindfulness

- Mindfulness related to aspects of personality and mental health
  - Lower neuroticism, psychological symptoms, experiential avoidance, dissociation
  - Higher emotional intelligence and absorption

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

And, as you travel life's highway, don't forget to stop and eat the roses.