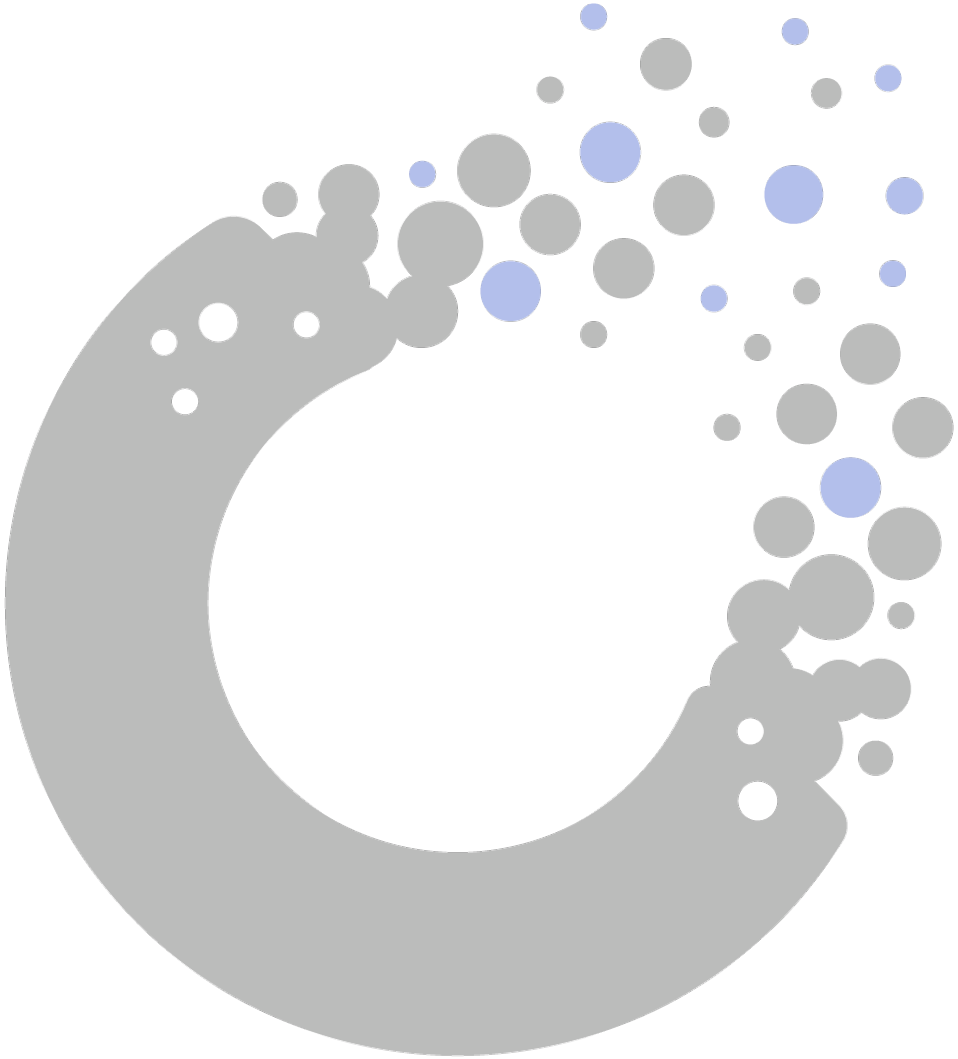
OXYGEN ADVANTAGE

MASTER INSTRUCTOR



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OXYGEN ADVANTAGE AND PSYCHOLOGY:

Between concentration training and peak performance

Alessandro Romagnoli

OXYGEN ADVANTAGE®
MASTER INSTRUCTOR

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- *Psychologist*
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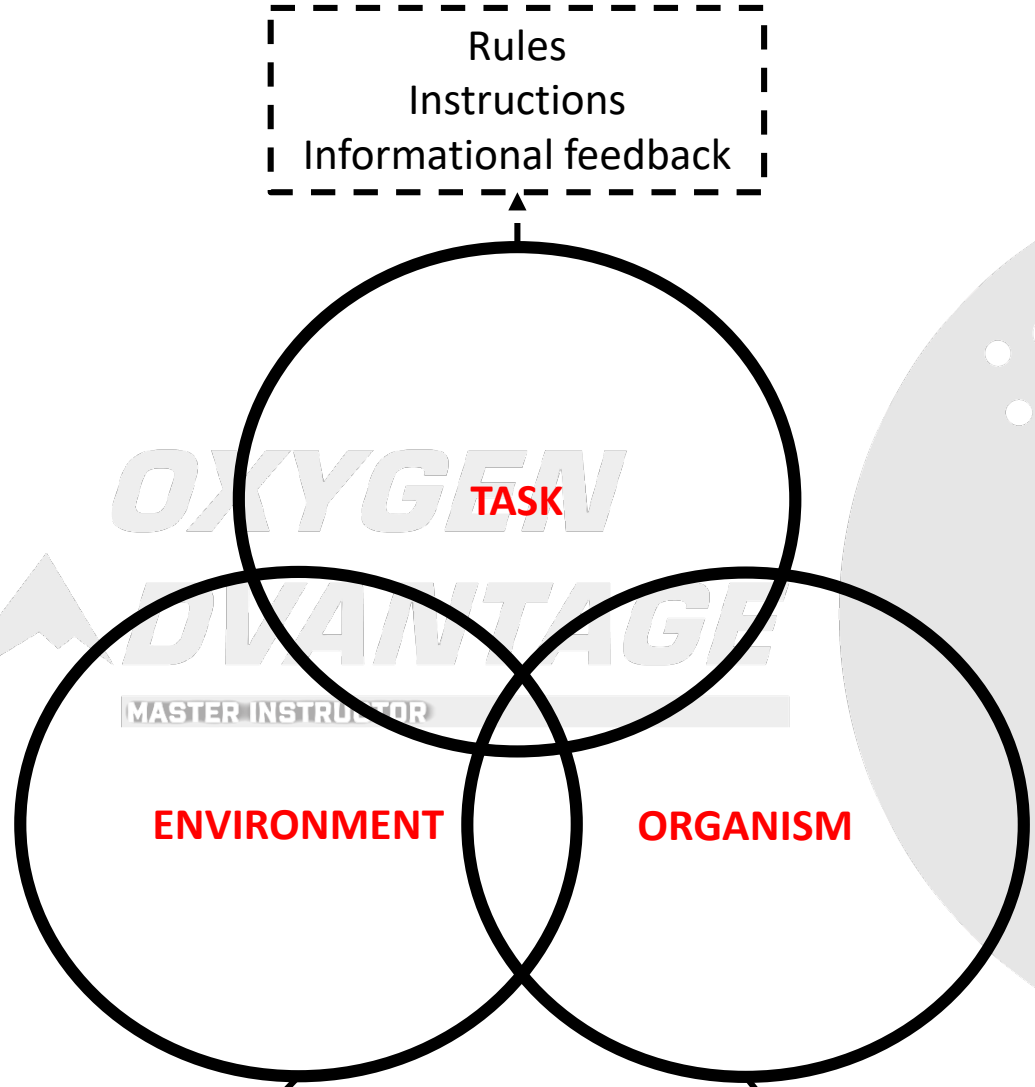
OxyLab360


OXYGEN ADVANTAGE
BY PATRICK MCKEOWN
ENHANCE YOUR PERFORMANCE THROUGH BREATHING

Glazier, P. S. (2017). Towards a grand unified theory of sports performance. *Human movement science*, *56*, 139-156.



Formation of **self-Organisation** of **Intra-** and **Inter-individual Coordinative** structures

Coordination patterns

Control patterns

Performance Outcome

Peak performance is a state of exceptional functioning

Wells, G. (2016). Peak Performance: A Literature Review.

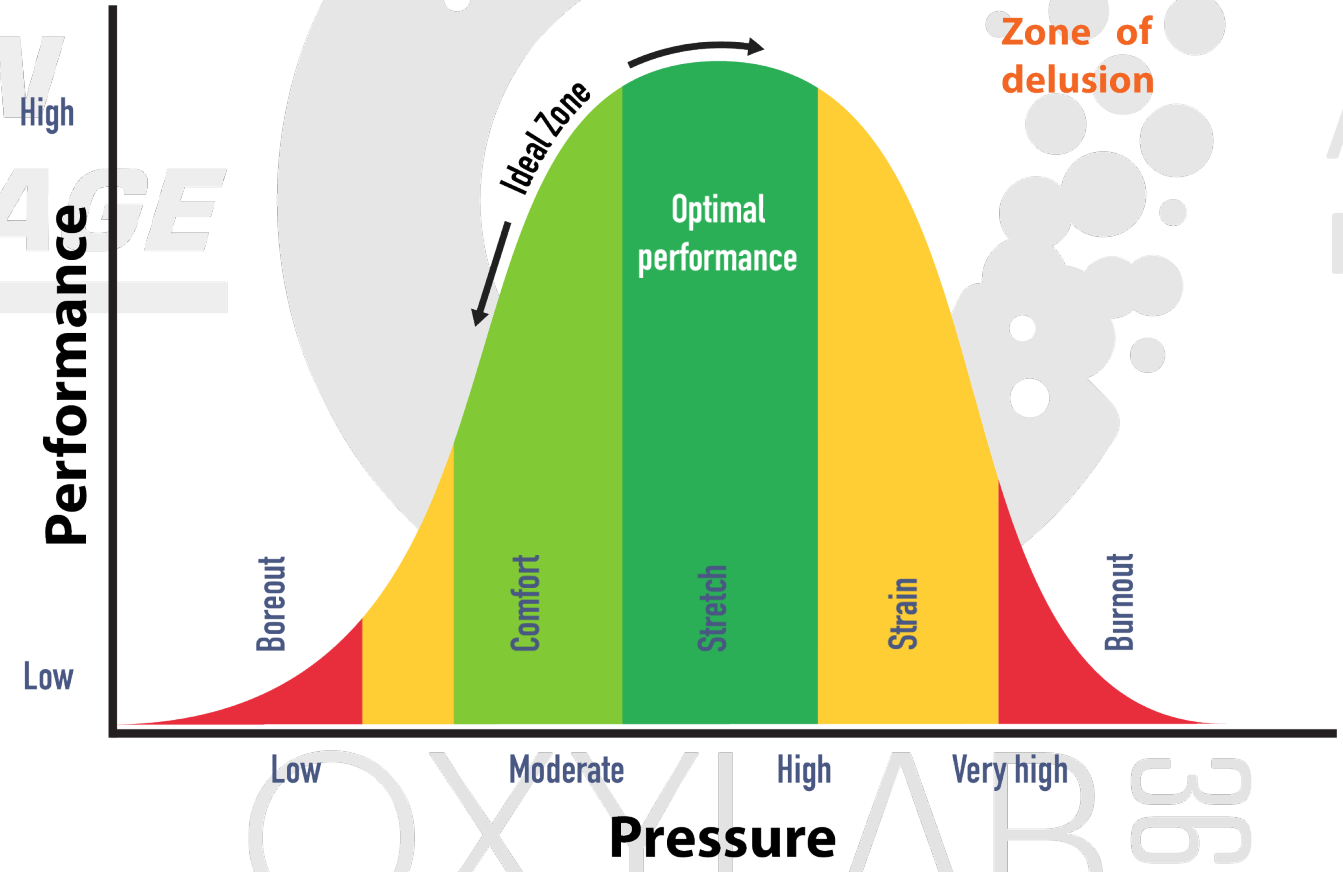
PERFORMANCE IS A COMBINATION OF:

- State of activation,
- internal and external pressures,
- technical, physical and mental skills,
- preparation and readiness,
- physical and mental relaxation,
- levels of focus and attention,
- confidence
- … and many other factors work together

Skills that can be learned and practiced.

Wells, G. (2016). Peak Performance: A Literature Review.

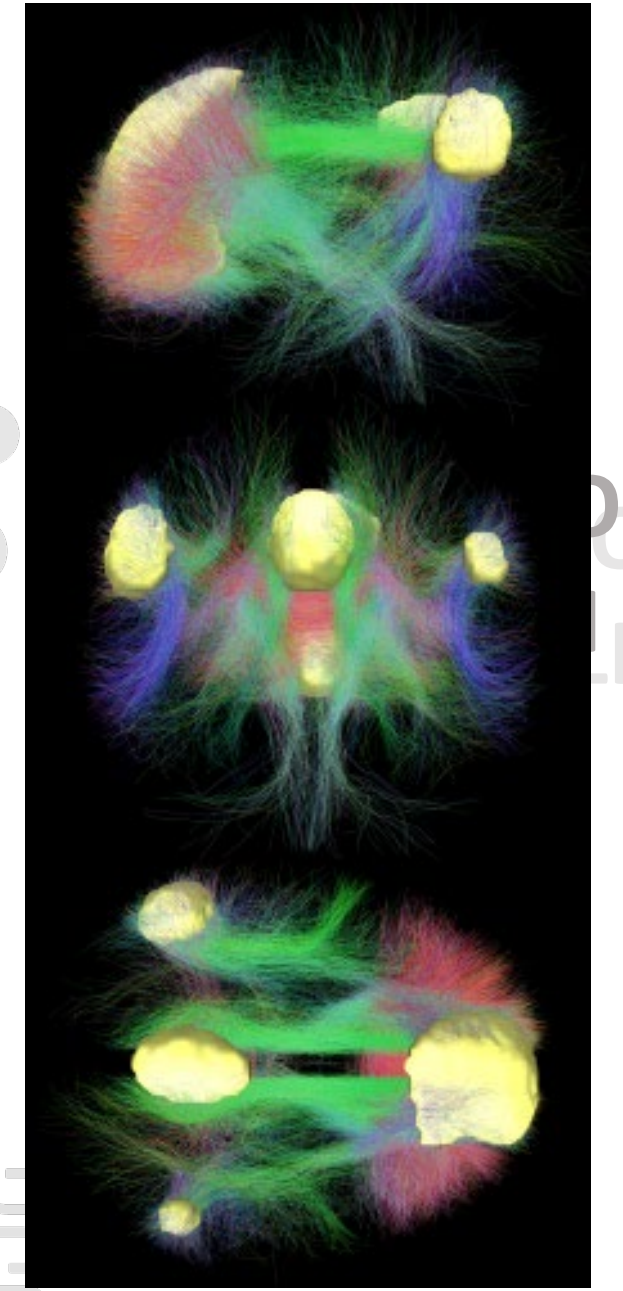
- Peak performance is a **state that can be entered** into through careful **training** and preparation during a moment of **optimal motivation**.

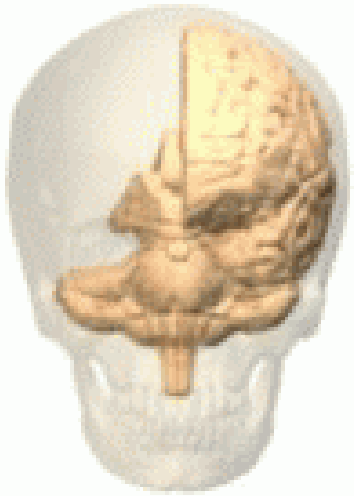


Wells, G. (2016). Peak Performance: A Literature Review.

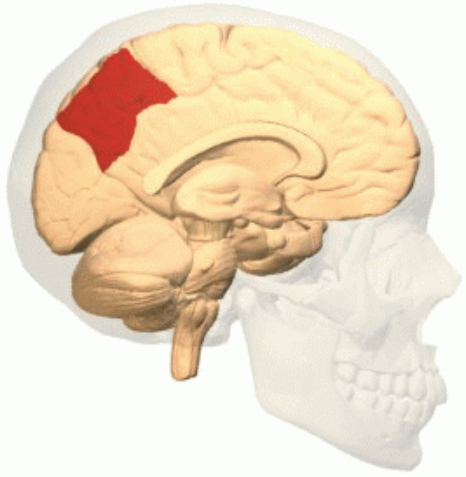
DEFAUT MODE NETWORK

- **Distributed set of regions** in association cortices showing **increased activity during undirected, awake "resting" states** relative to a wide variety of states that commonly **involve externally oriented attention**



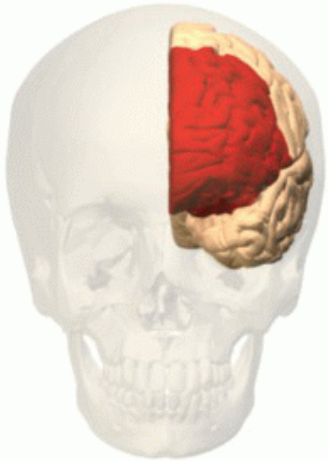


Posterior cingulate cortex

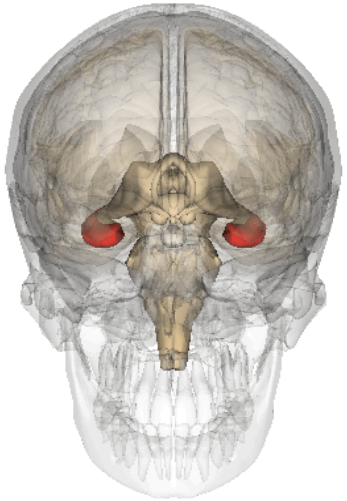


Precuneus

Angular Girus



Medial Prefrontal Cortex



Hippocampus

Inferior parietal cortex

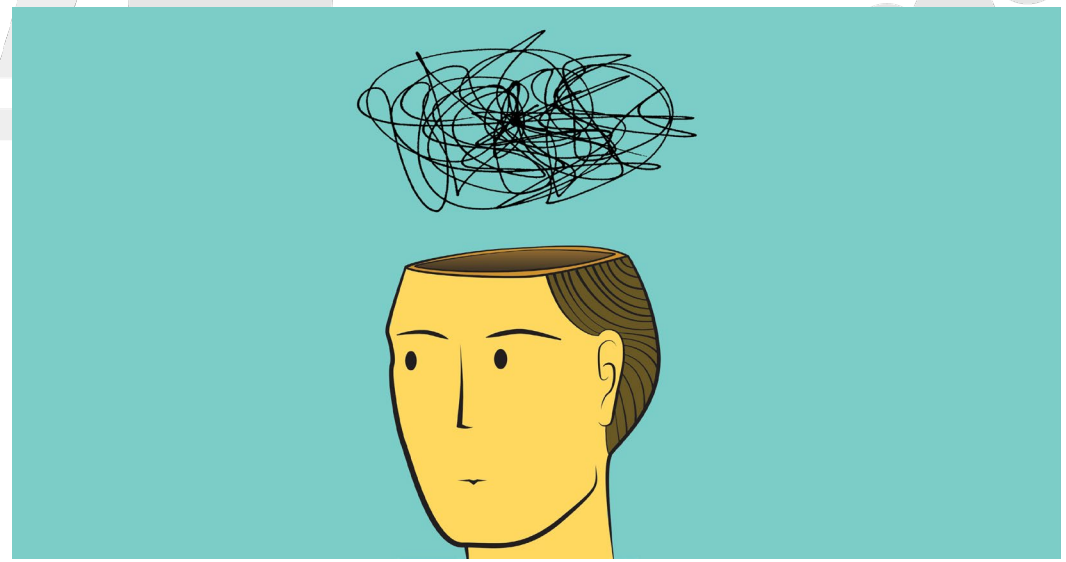
MIND WANDERING AND DEFAUT MODE NETWORK

- **Task-unrelated thought**, or the process by which **one's attention turns inward to focus on self-generated thoughts** or feelings instead of stimuli in the **external world**

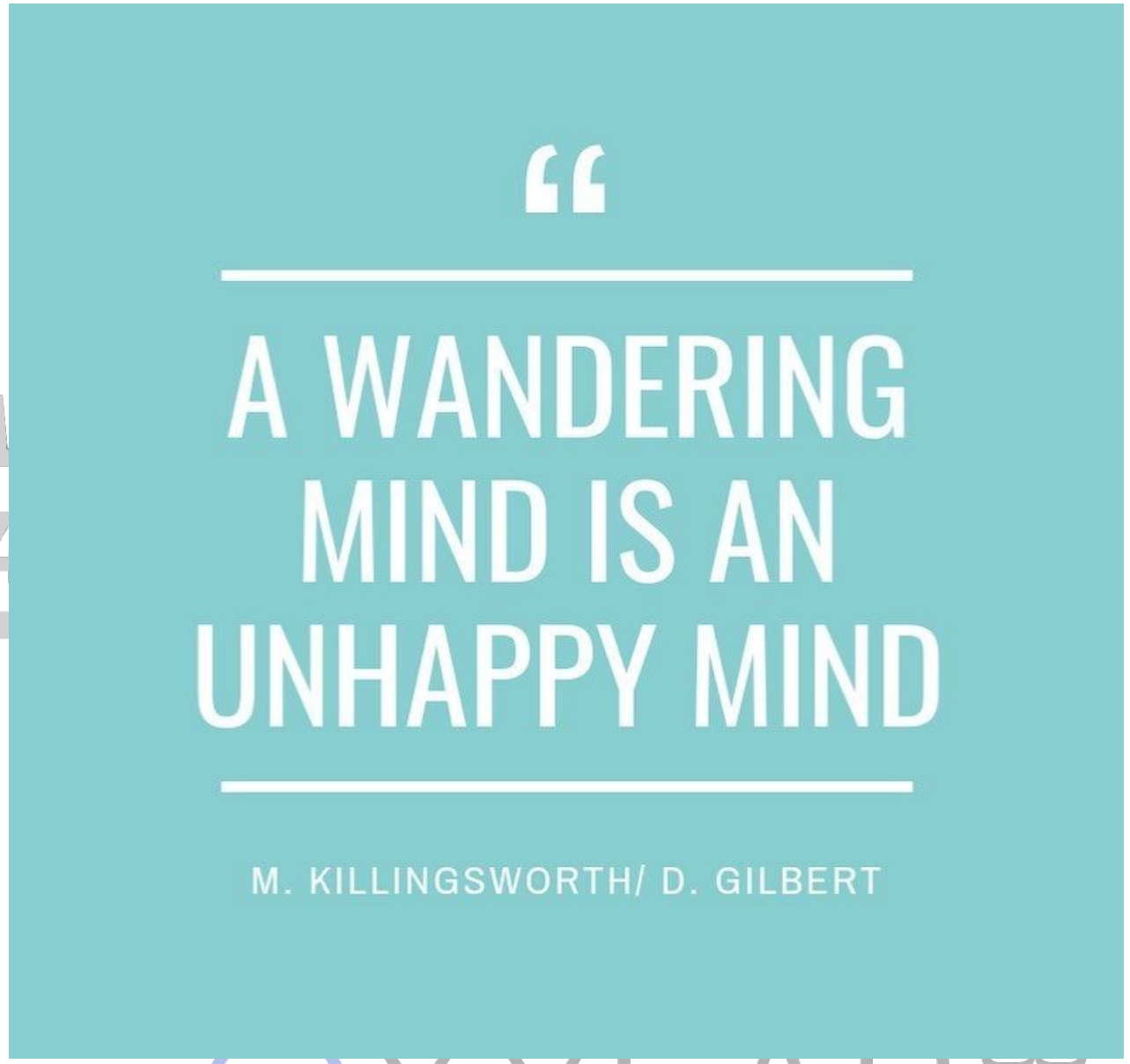
Philippi, C. L., Bruss, J., Boes, A. D., Albazron, F. M., Deifelt Streese, C., Ciaramelli, E., ... & Tranel, D. (2021). Lesion network mapping demonstrates that mind-wandering is associated with the default mode network. *Journal of neuroscience research*, *99*(1), 361-373.

- Mind-wandering is defined as a **spontaneous thought** that shifts the **focus away** from a current on-going task to **inner mind-flow**.

- This **mind-flow** often occupies a **considerable portion of waking time** among people everywhere engaged in **thoughts unrelated to the here-and-now**.



Kucyi, A., Esterman, M., Riley, C. S., & Valera, E. M. (2016). Spontaneous default network activity reflects behavioral variability independent of mind-wandering. *Proceedings of the National Academy of Sciences*, *113*(48), 13899-13904.



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Killingsworth, M. A., & Gilbert, D. T. (2010). A wandering mind is an unhappy mind. *Science*, *330*(6006), 932-932.

- Web application iPhone
- Find out how often people’s minds wander,
- what topics they wander to,
- how those wanderings affect their happiness,
- 2250 adults

- **“How are you feeling right now?”**

answered on a continuous sliding scale from very bad (0) to very good (100),

- **An activity question (“What are you doing right now?”)**

Answered by endorsing one or more of 22 activities

- **A mind-wandering question**

(“Are you thinking about something other than what you’re currently doing?”)

Answered with one of **four options**: no; yes, something pleasant; yes, something neutral; or yes, something unpleasant.

CONCLUSIONS:

1. People's minds **wandered frequently**, regardless of what they were doing.
2. People were **less happy when their minds were wandering** than when they were not and this was true during all activities.
3. **What people were thinking was a better predictor of their happiness** than was what they were doing.

IN SUM…:

- 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.

Mind wandering and Anxiety

- Individuals with **high-trait-anxiety try to control situations as much as possible**, allocating excessive attentional resources in order to detect potential threat-related stimuli.
- Consequently, their attention to the environment is constantly maintained at a higher **level affecting cognitive performance** and the ability to **down-regulate negative emotions**
- **Decrease of DMN functional connectivity** in individuals with high-trait-anxiety

Imperatori, C., Farina, B., Adenzato, M., Valenti, E. M., Murgia, C., Marca, G. D., … Ardito, R. B. (2019). Default mode network alterations in individuals with high-trait-anxiety: An EEG functional connectivity study. Journal of Affective Disorders, 246, 611–618. doi:10.1016/j.jad.2018.12.071

- Derives from latin “*angere*” -> *to tighten up*;

- a tendency to be in a **constant** (anxious) state of worry and leading to **disproportionate** and **incongruous** concerns in different areas of life

- **Basic function**: Protect from a future event;

CHARACTERISTICS :

PHYSIOLOGY

- ↑ heart rate;
- chest pain or pressure;
- ↑ breathing rate;
- Sense of suffocation,
- stomach discomfort,
- nausea o diarhrea,
- shivering or hot flashes;
- Muscle tension;
- dizziness and lightheadedness;

EMOTION:

- strong feelings of threat
- tension and agitation;
- worry;
- impatience and irritability;
- excessive reactivity;
- sense of oppression and fear;

COGNITION:

- Negative thoughts
- Worry
- Sense of oppression and fear;
- Difficulty concentrating

EMOTION:

- strong feelings of threat
- tension and agitation;
- worry;
- impatience and irritability;
- excessive reactivity;
- sense of oppression and fear;

- Mouth breathing **alters activity in specific cortical areas and affects cognitive functions**.

- Decreased activity in both the **left** and the **right hippocampus during mouth breathing** can possibly affect **memory formation**,

- Mouth breathing play a role as a contributor to **reduced attention and/or academic performance**

Park, C., Park, C. A., & Kang, C. K. (2021). Evaluation of brain function during different types of breathing using FDG-PET compared with using BOLD-fMRI. *Journal of the Korean Physical Society*, 1-8.

- Mouth breathing was thus shown to result in an **increasing oxygen load in the prefrontal cortex** when compared with nasal breathing.

- **increased oxygen load in the prefrontal cortex** is no more than a result of the voluntary input necessary for breathing through the non preferred mouth route.

- **ADHD** is reported to be associated with **prefrontal cortex function**

Park, C., Park, C. A., & Kang, C. K. (2021). Evaluation of brain function during different types of breathing using FDG-PET compared with using BOLD-fMRI. *Journal of the Korean Physical Society*, 1-8.

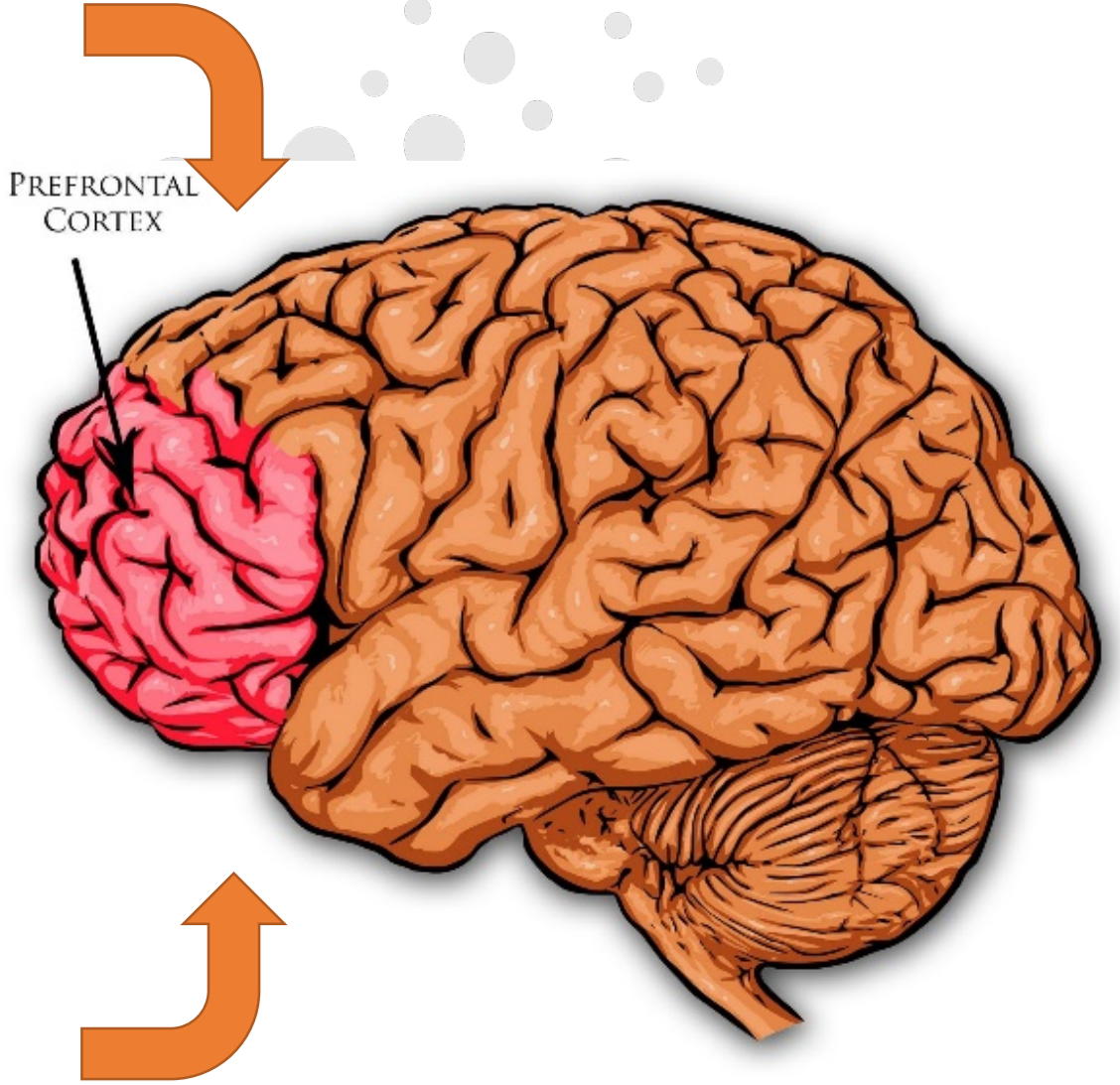
PREFRONTAL CORTEX:

- Neuroimaging studies repeatedly show abnormalities in the **prefrontal cortex in anxious individuals**.

- **Two classes of anxiety disorders**:
  1. Disorders involving **intense fear and panic**
     → Underactivity of the prefrontal cortex, thus disinhibiting the amygdala

  2. Generalized anxiety disorder and obsessive-compulsive disorder, which involve ***worry*** and ***rumination***.
     → Overactivity of the prefrontal cortex.

The human dimension: how the prefrontal cortex modulates the subcortical fear response. Rev Neurosci. 2007;18(3-4):191-207.



COMPETITIVE ANXIETY EFFECTS ON SPORT PERFORMANCE:

- Engage in excessive error monitoring.
- Reduce anticipation timing performance.
- Decrease search rate and processing efficiency.
- Negative effect on shooting accuracy in soccer players.
- Heighten the risk of sport injury.
- Competitive trait anxiety is a risk factor for musculoskeletal injury in athletes.

TECHNIQUES THAT EMPHASISE THE ELEVATION OR PROTECTION OF SELF-CONFIDENCE

- **Self-confidence** helps to **buffer against negative anxiety** symptoms and **promote facilitative interpretations** of such symptoms.

- To help **athletes reduce competitive anxiety intensity**, or promote more facilitative interpretations of anxiety symptoms.

Ong, N. C., & Chua, J. H. (2020). Effects of psychological interventions on competitive anxiety in sport: A meta-analysis. *Psychology of Sport and Exercise*, 101836.

TECHNIQUES

RECENT TECHNIQUES:

- Mindfulness,
- Biofeedback training / Neurobiofeedback,

MENTAL SKILL TECHNIQUES:

- Include self-talk,
- Imagery,
- Pre-performance routines,
- Goal setting,
- Cognitive restructuring,
- Relaxation techniques,

Lenoir, F. (2014). ***La rencontre du bouddhisme et de l'Occident*****. Fayard.**
Romagnoli, A. (2016) ***A mindfulness study: between Orient and Occident, between Buddhism and neuroscience*****.**

Google Trends

The oxygen advant...
Termine di ricerca

Wim Hof
Termine di ricerca

Breathwork
Termine di ricerca

Buteyko
Termine di ricerca

Tutto il mondo | 2004 - Presente | Tutte le categorie | Ricerca Google

Interesse nel tempo

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The oxygen advantage
Termine di ricerca

+ Confronta

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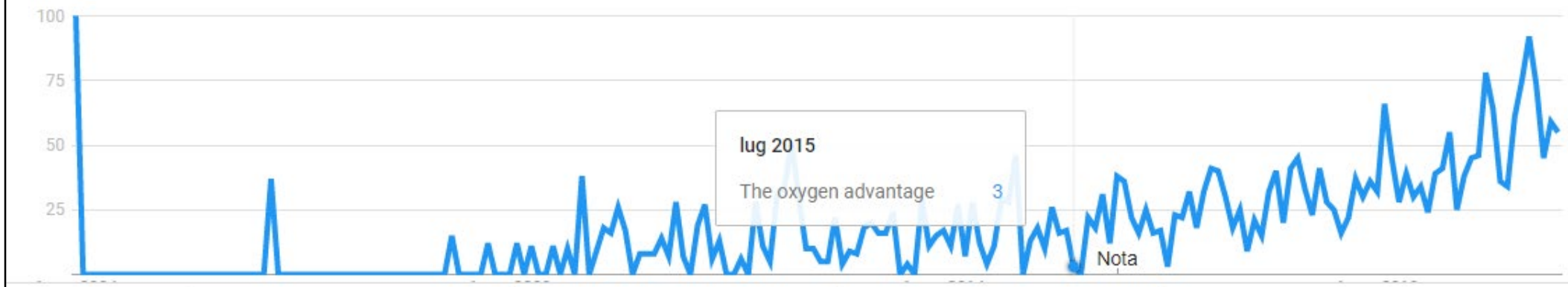
Tutto il mondo | 2004 - Presente | Tutte le categorie | Ricerca Google



Google Trends

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BREATHING AND EMOTIONS:

- Breath and emotions are bi-directional
- Emotions induces certain respiratory pattern
- Voluntary changes in breath pattern induce specific emotions
- Voluntarily regulated breathing practices (VRBPs)

Philippot, P., Chapelle, G., & Blairy, S. (2002). Respiratory feedback in the generation of emotion. *Cognition & Emotion*, *16*(5), 605-627.

NERVOUS SYSTEM

PARASYMPATHETIC

SYMPATHETIC

The parasympathetic nervous system decreases the heart rate,

while the sympathetic nervous system increases the heart rate.

PTSD, depression, and epilepsy

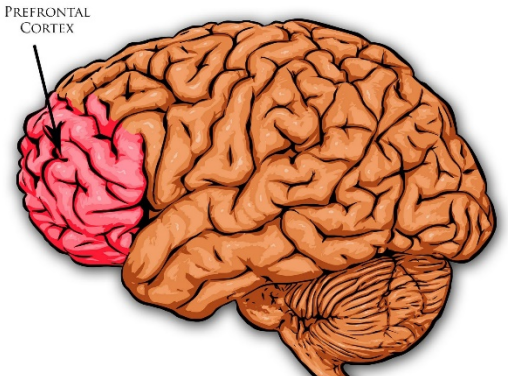
↓ Emotion regulation

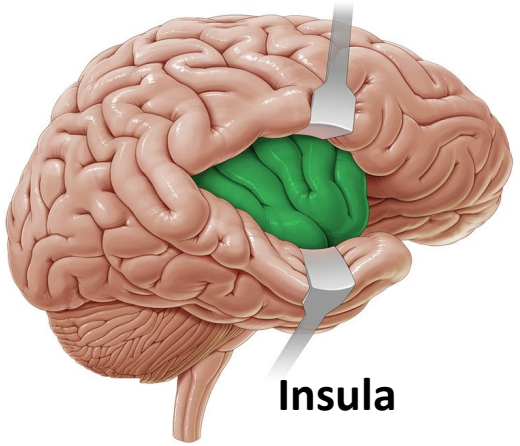
TELENCEPHALON

THALAMUS

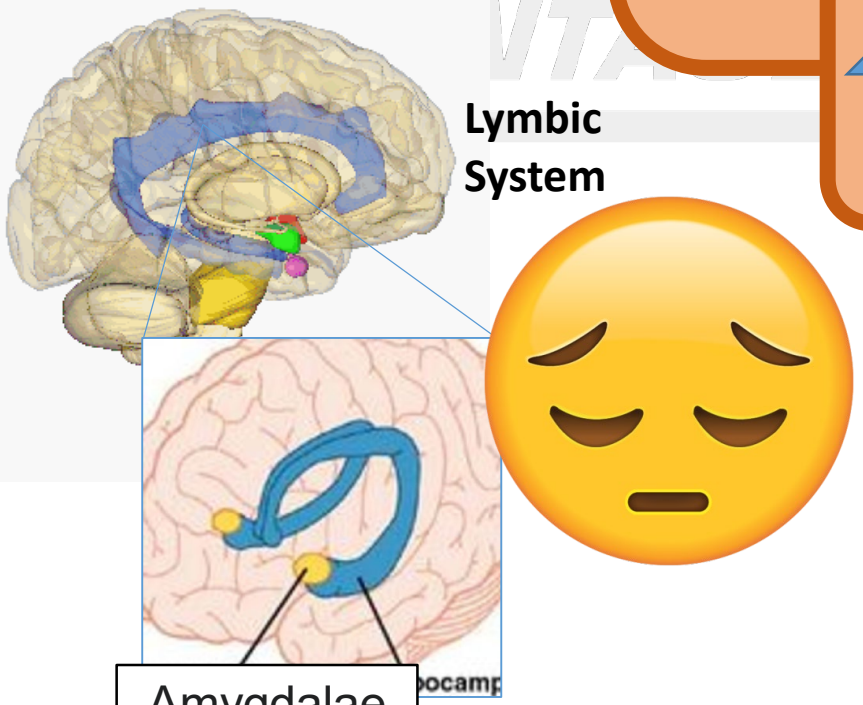
IPOTHALAMUS

Prefrontal cortex





Insula



Lymbic System

Amygdalae

Gerbarg, P. L., & Brown, R. P. (2016). Neurobiology and Neurophysiology of Breath Practices in Psychiatric Care. *Psychiatric Times, 3* (11), 22-25. Retrieved from https://touroscholar.touro.edu/nymc_fac_pubs/2143

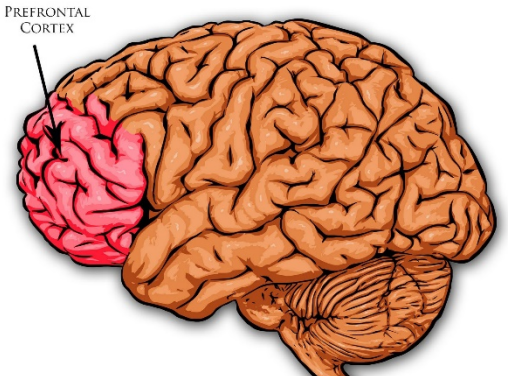
↑ Emotion regulation

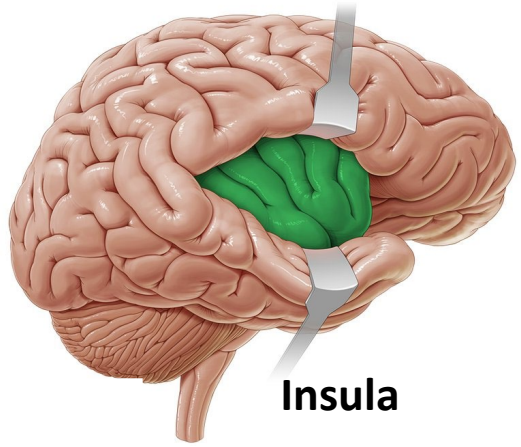
TELENCEPHALON

THALAMUS

IPOTHALAMUS

Prefrontal cortex





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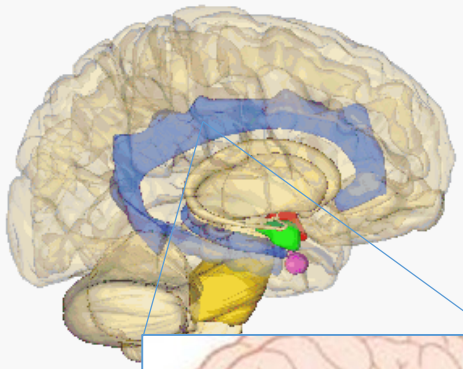
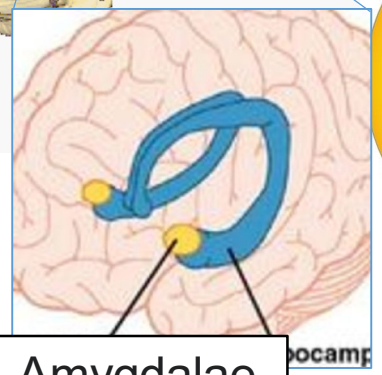


Lymbic System



Amygdalae

CONCLUSIONS:

- Switch to mouth breathing in everyday life for better cognitive ability:
  - ↑ Awareness
  - ↑ Sustained Attention
  - ↑ Emotion regulation
  - ↑ Memory
  - ↑ Accademic performance
  - ↑ Metacognitive functions
  - ↑ Decision Making
- The possibility to combine many OA exercises with other mental techniques.

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Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on psychological science*, *6*(6), 537-559.