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# **From motivation to breaking point: The impact of stress and anxiety on learning and wellbeing**

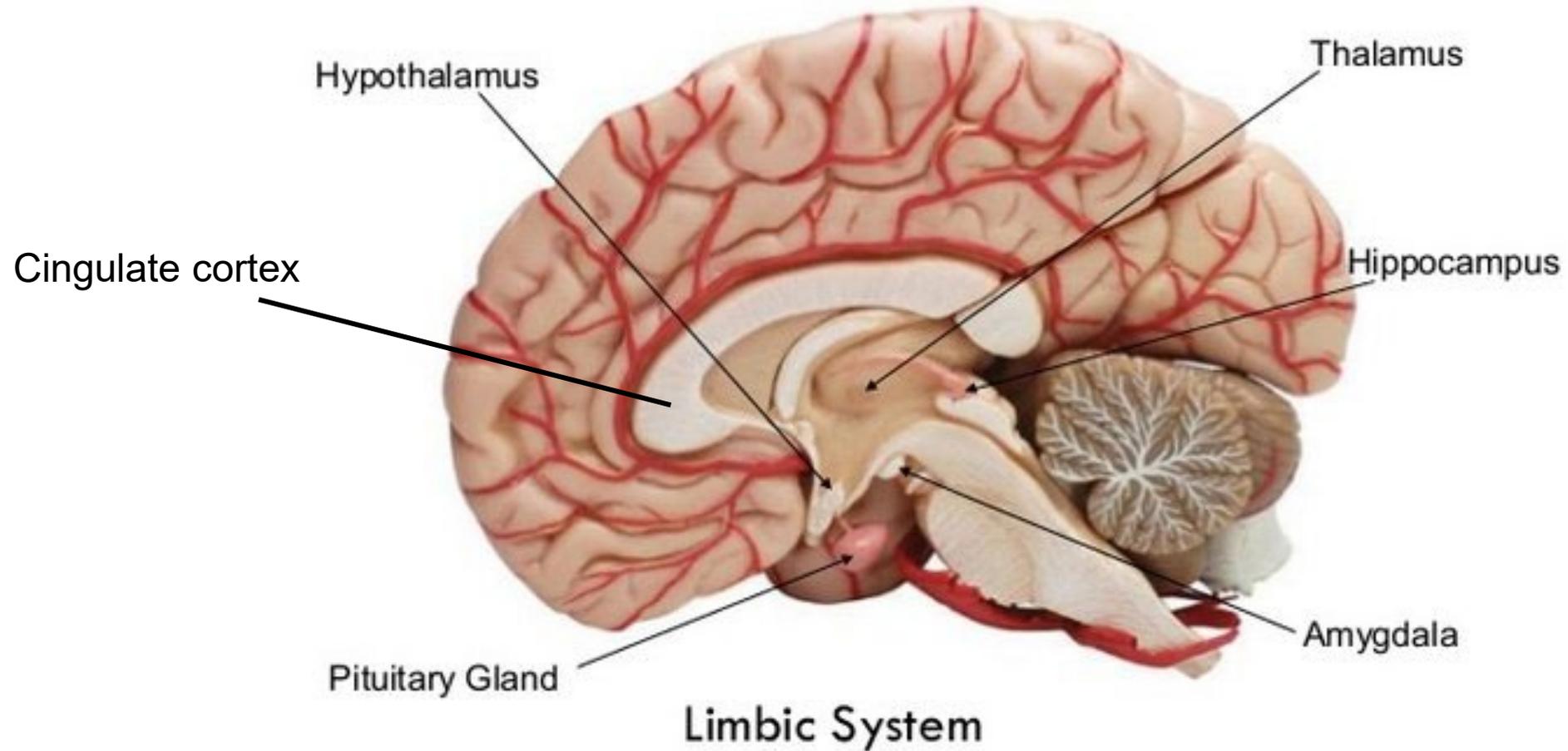
**Professor Jo Van Herwegen**

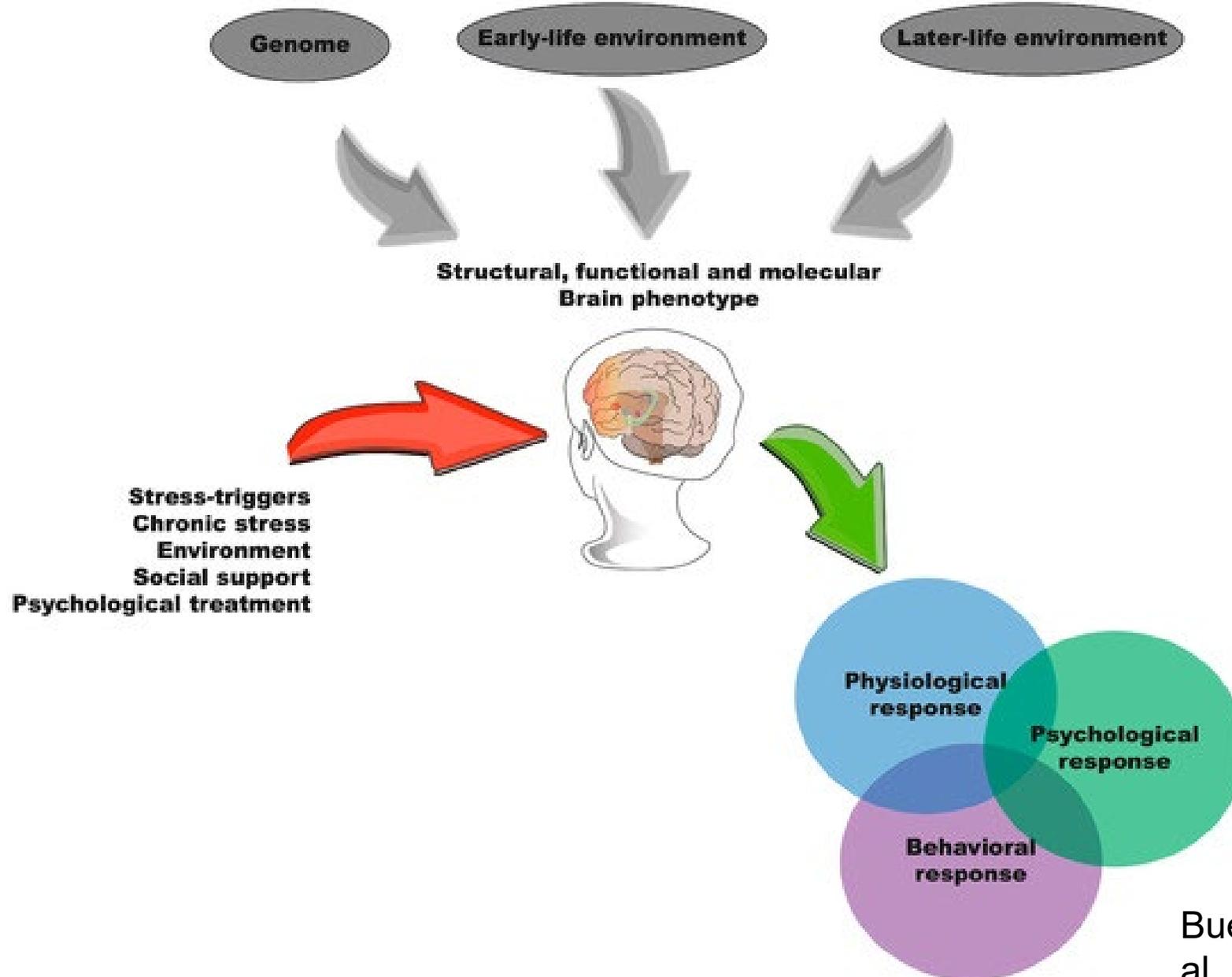


# Emotions are important for the brain



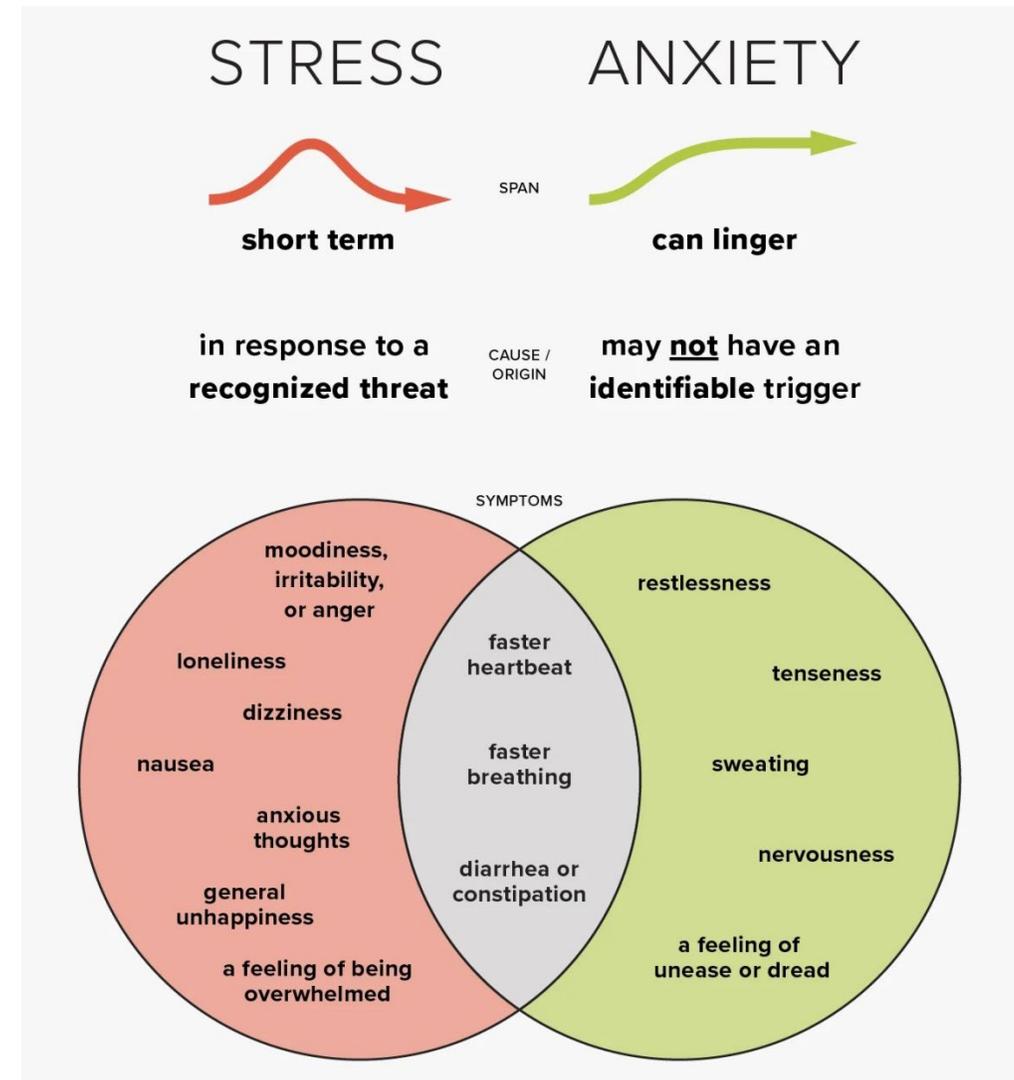
# Brain of Emotions





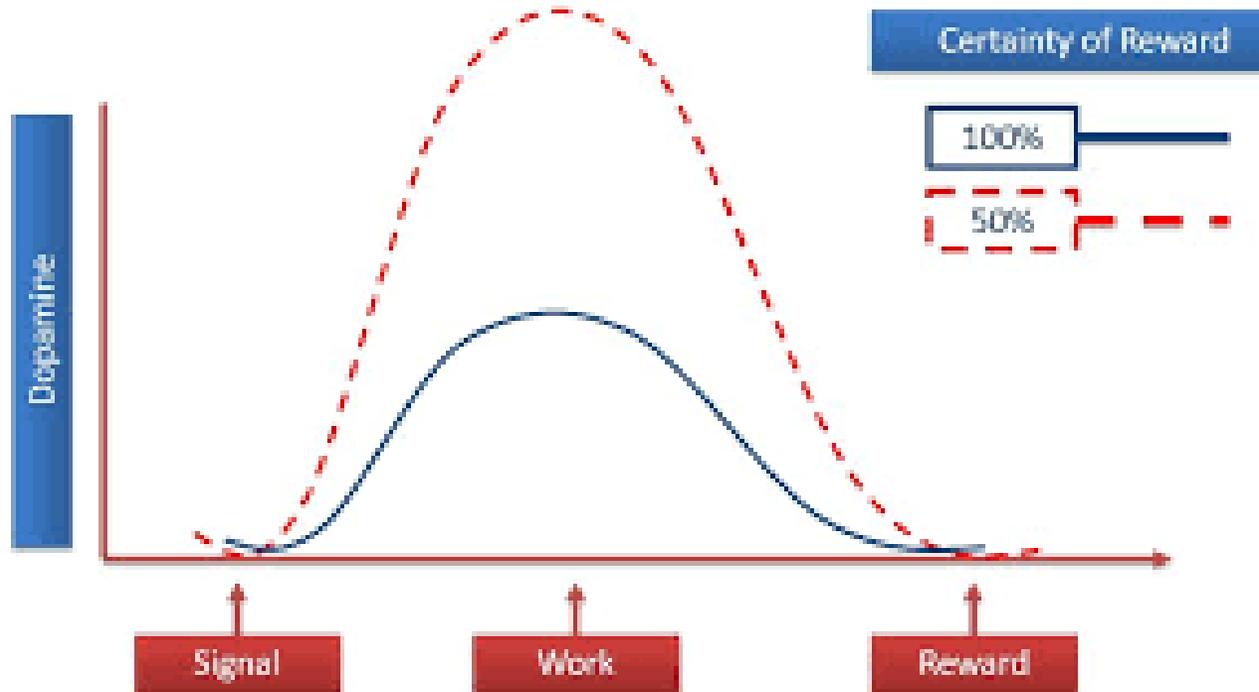
# Stress and anxiety

- Acute vs chronic stress (Epel et al., [2018](#))
- Activation of the HPA axis and cortisol release
- Adaptive vs maladaptive stress responses
- Differentiating normal anxiety from clinical anxiety



# Stress and anxiety

- **Good stress:** Moderate fear or uncertainty can boost motivation and learning via dopamine release



# Stress and Learning

## The Yerkes and Dodson Law

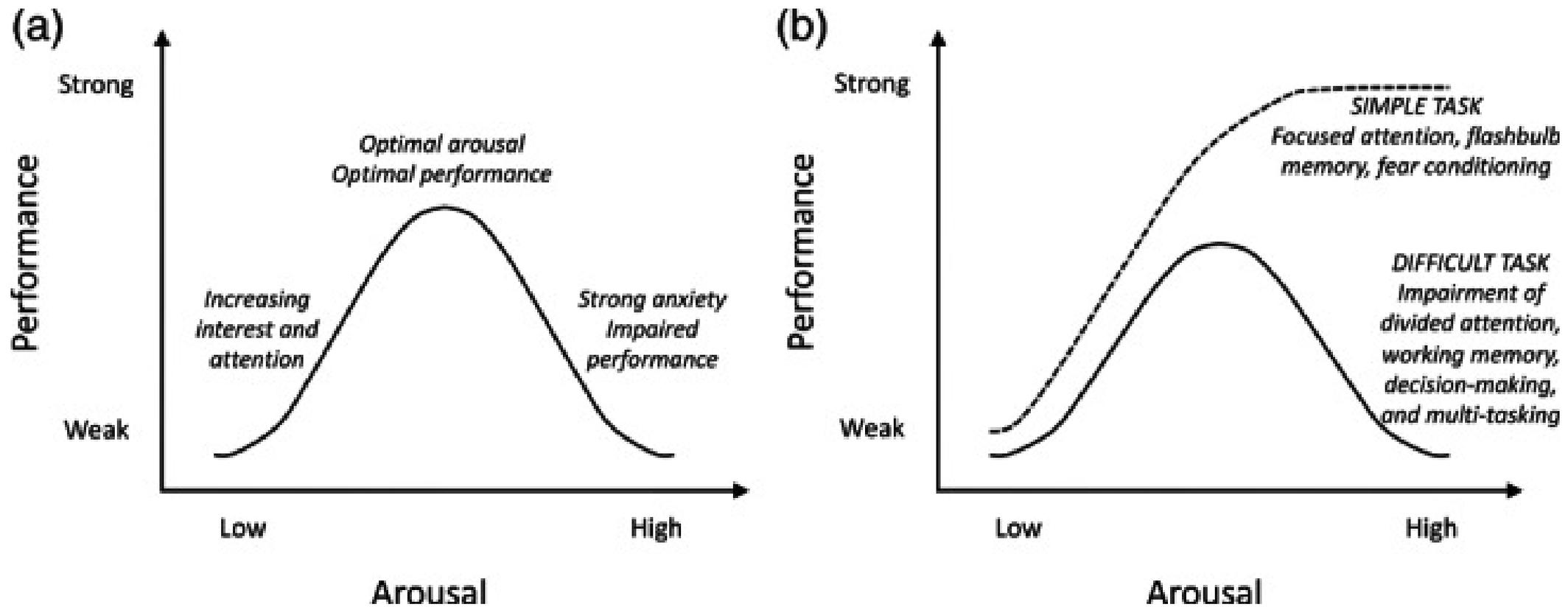
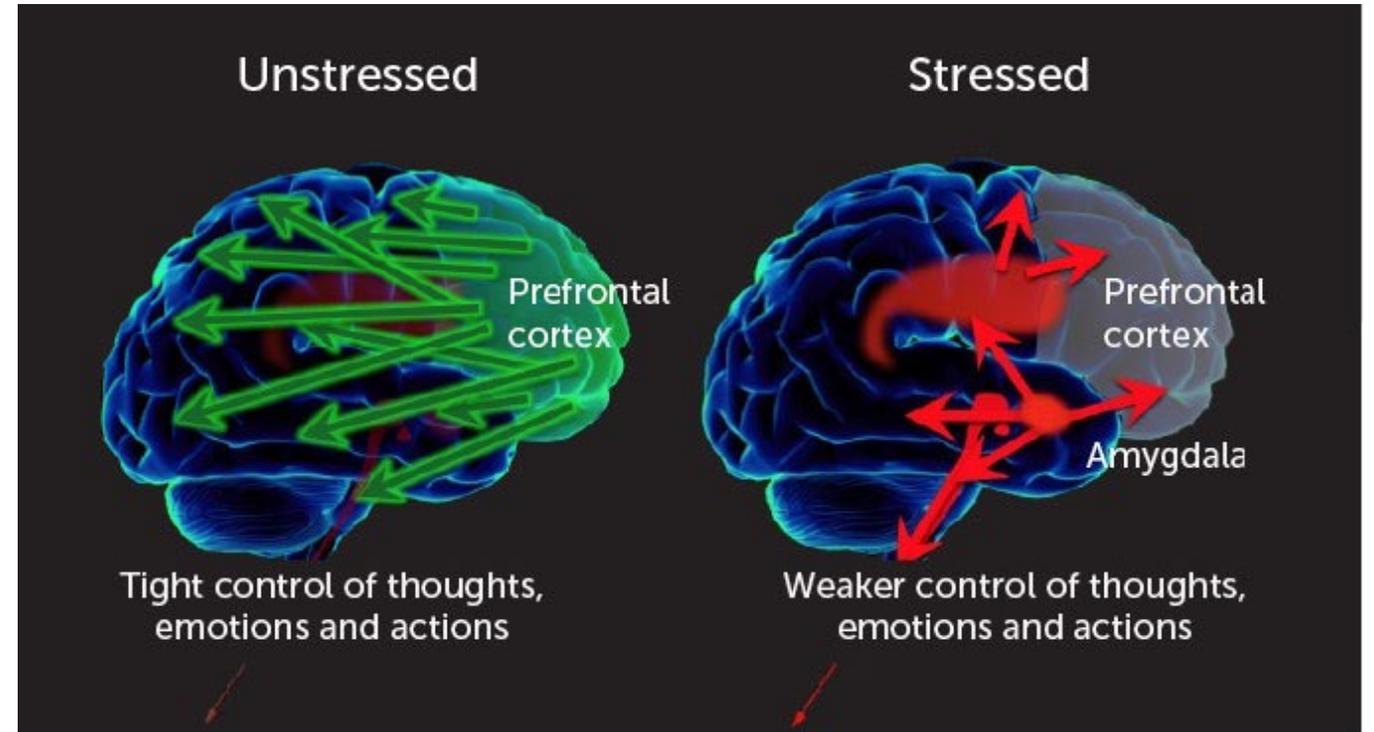


Figure is adapted from Diamond et al. (2007, Figure 2).

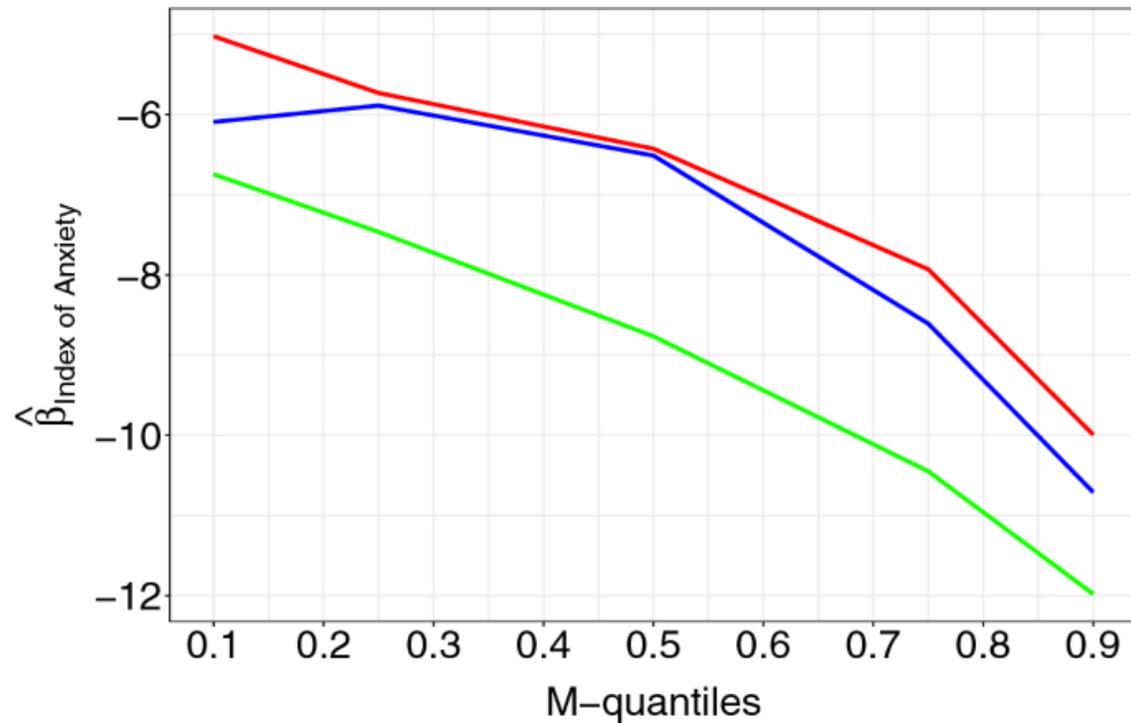
# Stress and anxiety

bad stress = impact on learning

- Timing of stress: before or after a task can be negative: memories about stress will be prioritised over memories for learning.
- Too much stress: higher cortisol= impairs WM, planning and, inhibition



# Anxiety/ stress and school achievement



Estimated effect of the anxiety index on mathematics (blue line), science (green line) and reading (red line)

7142 students from 283 schools in Italy

PISA scores

Differences for outcomes  
Achievement/skill levels  
Gender

**D'Agostino et al (2025)**

# Emotional responses are learned

- **Learned socially** (through observing others' emotions) (Askew & Field, 2007)
- **Reinforced culturally** (through norms and modelling)
- **Modified through learning** (e.g., exposure, discussion, or emotional regulation).



BUT Genetic vulnerability (Keers et al., [2016](#); Kuijper et al., [2019](#))

# What do students see and hear



### 'Over 60% of teens suffer from depression'

**INTERNET ADDICTION (%)**

- No addiction: 21.9 (average age: 24.7)
- Discretionary internet problems: 26
- Severe level of addiction: 8.3

	Depression	Anxiety	Self-harm	Substance	Alcohol	Drugs	Overall (range 0-10)
Boys	30.7	27.9	18.8	6.5	6.1		
Girls	33.5	34.5	13.8	13.8	13.8		
Sex	45.2	31.1	16.8	16.5	13.8		

**THE MENTAL PICTURE**

The study was conducted on students in the 2012-13 academic year.

Simple term: **ADP**

Doctors advised: Therapeutic, Risperidone, and Fluoxetine.

Age group of participants: **15-16 yrs**

Mean age: **14.8 yrs**

Percentage of girls: **56.7%**

Percentage of boys: **43.3%**

Internet addiction: "There was a higher score of internet addiction from more symptoms of depression and anxiety. We found out that boys face more problems than girls. Students who access games have a higher internet addiction score compared to those in rural places," said Sharon Thomas, a director with the Child and Adolescent Mental Health Services in the United Kingdom. Dr Thomas was one of the two members who evaluated the study.

The study points to the need for strengthening school-level interventions and practices to mental health. At present, focus is mainly on physical well-being. "Only a few schools have a psychological counselor. The situation depends largely on the school and not just superficial campaigns," said Alison Roddy, deputy head of a school in London that was one of the schools included in the study.

mental health of adolescents in the state. It is startling to know that over 60% of students have symptoms of elevated depression or anxiety. "We need to understand the prevalence and severity of internet addiction."

"The sample size is good enough to assess the overall



**Disaster at sea: global warming hits UK birds**

A QUANTITATIVE study of adolescent students in the state has found over 60% of participants suffering from depression and anxiety. Conducted by Social Entrepreneurs Charitable Trust, an NGO, the study pointed out the need for urgent mental attention for around 10% to 20% of students for depression and over 21% for internet anxiety.

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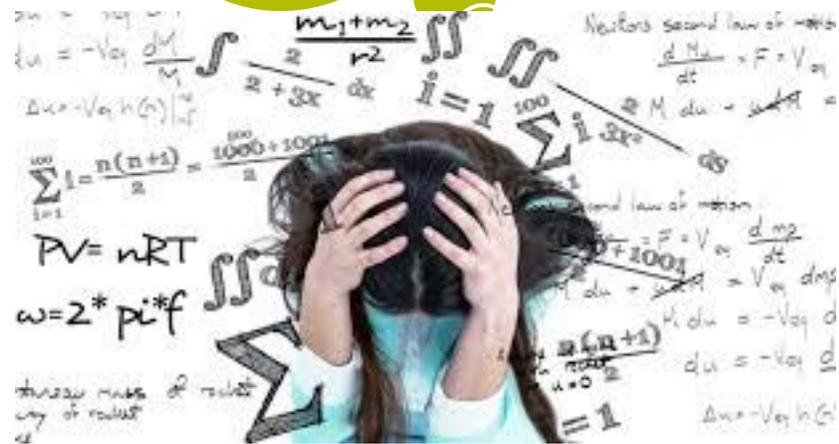
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# What do students see and hear

I don't think I am good at maths,  
 I am getting negative points  
 Maths is difficult  
 I am in the bottom half  
 I don't like maths



Everybody is talking about mats  
 anxiety  
 Everybody else thinks maths is  
 difficult  
 Should I be worried?



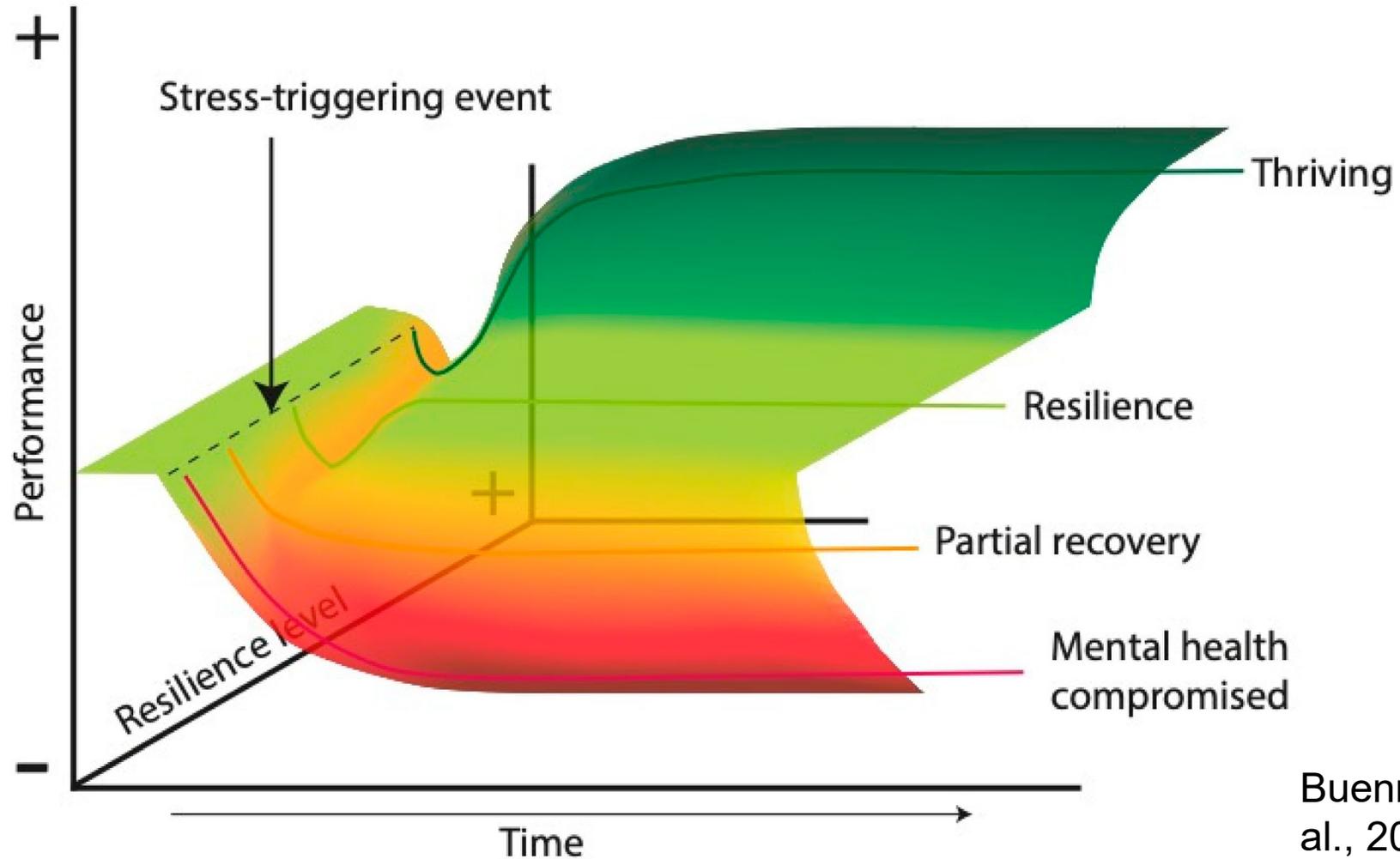
# Emotion regulation

- Our ability to modulate the intensity and duration of our emotions in line with our current goals
- Dorsomedial prefrontal cortex implicated

Morawetz et al. (2024)



# Creating resilience



# Supporting mental health in schools

- Mindfulness
- CBT
- Stress-reduction techniques
- Role of supportive environments
- Importance of early identification and intervention

# Impact of mindfulness

- Review of 33 RCTS= small effects on mindfulness, depression and anxiety/stress (Dunning et al., [2019](#)). But often includes self report measures and publication bias.
- The outcomes were not significantly affected by the number of hours of training.
- Individual differences: some have reported negative effects.

## 7 Steps to Mindfulness

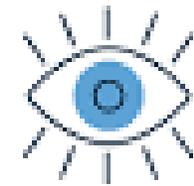
Mindful Breathing



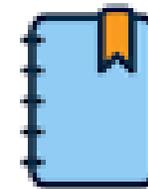
Meditation



Awareness



Daily Journaling



Self-Acceptance



Turn Off Distractions



One Task Focus



TOUCHPOINT  
BY THE UCL FOUNDATION

# Growth Mindset

- Carol Dweck (2000): the belief that your abilities, intelligence, and talents can be developed through dedication, hard work, and persistence.
- Embraces challenges
- Persists through obstacles:
- Views effort as the path to master
- Learns from criticism:
- Finds inspiration in others' success

# Growth Mindset

Several systematic reviews:

**Macnamara and Burgoyne (2022):** 3 reviews

- General impact of interventions: 63 studies ( $N = 97,672$ ),  $d = 0.05$
- influence on students' mindset: 13 studies ( $N = 18,355$ ),  $d = 0.04$ .
- RCTs on academic outcomes: 6 high-quality studies ( $N = 13,571$ ),  $d = 0.02$

**Burnette and colleagues (2023)**

Impact on academic outcomes: 32 studies (48 samples) ( $N = 51,676$  students,  $d = 0.09$ . but for low achievers in high quality studies  $d = 0.14$ )

**Gazmuri (2025);**

- systematic review ( $n = 24$ ) but many have conflict of interest bias.
- 4 studies did not have bias: 2 no impact on academic outcome, 2 have small effect outcomes.

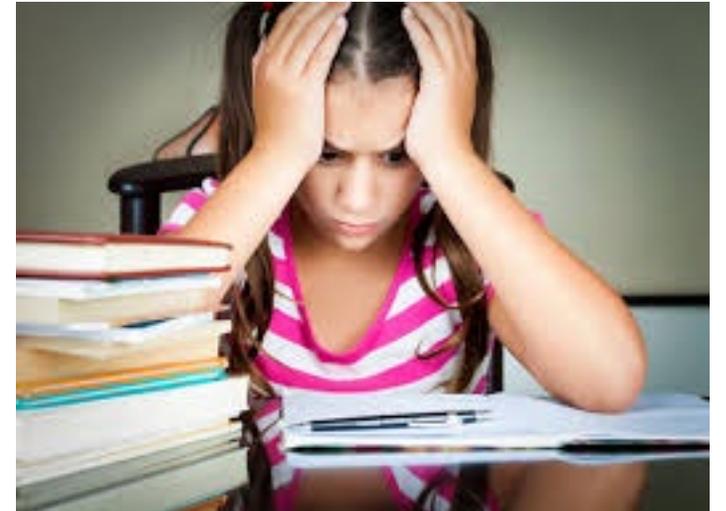
# Growth Mindset

- if there are chances to execute these interventions at a minimal or negligible expense, it could be worthwhile to proceed, considering the possibility of achieving a slight positive effect.”



# An alternative ways of coping

- What psychological factors causes stress?
- unpredictability,
- novelty
- out-of-control feeling
- a social-evaluative threat.



# Reappraisal interventions

- **Benevolent Humour:** Humorous coping was more difficult to implement but more effective in reducing negative emotions and increasing positive ones. (Sampson et al., 2014)
- **Cognitive reappraisal:** Reframing a situation to change its emotional impact. (more positive) (Gross & John, 2003; Webb et al., 2012):



Even though I failed the test, it's a learning opportunity, not a disaster.”

# Alternative solutions

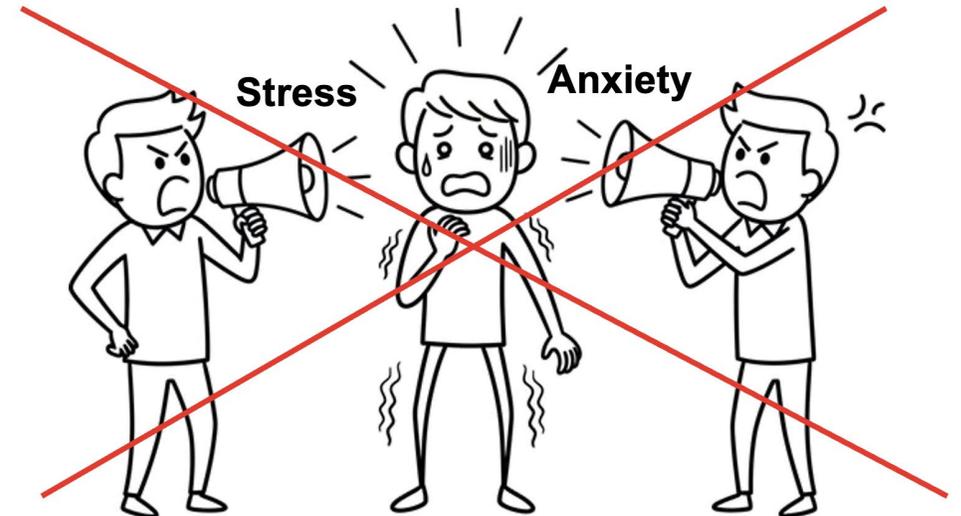
- **Problem-solving:** Actively addressing the source of stress.

“What can I do differently next time?”

- **Social support:** Talking with friends or professionals.
- **Distraction:** Temporarily shifting attention away from the stressor.

# Getting it right

- Teach students that emotions are controllable (Somerville et al., 2023)
- Teach self-regulation strategies (De Castella et al., 2013)
- Teach problem solving
- Provide emotional support



# Thank you

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# References

- Antonella D'Agostino, Spagnolo, F. S., & Salvati, N. (2021). Studying the relationship between anxiety and school achievement: evidence from PISA data. *Statistical Methods & Applications*, 31(1), 1–20. <https://doi.org/10.1007/s10260-021-00563-9>
- Buenrostro-Jáuregui, M. H., Muñoz-Sánchez, S., Rojas-Hernández, J., Alonso-Orozco, A. I., Vega-Flores, G., Tapia-de-Jesús, A., & Leal-Galicia, P. (2025). A Comprehensive Overview of Stress, Resilience, and Neuroplasticity Mechanisms. *International Journal of Molecular Sciences*, 26(7), 3028. <https://doi.org/10.3390/ijms26073028>
- Whiting, S. B., Wass, S. V., Green, S., & Thomas, M. S. C. (2021). Stress and Learning in Pupils: Neuroscience Evidence and Its Relevance for Teachers. *Mind, Brain, and Education*, 15(2), 177–188. <https://doi.org/10.1111/mbe.12282>