

The Art of Directing Attention

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Student Wellbeing Service

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Educational Neuroscience

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WILEY Blackwell

HANDBOOK OF POSITIVE PSYCHOLOGY

EDITED BY

C. R. SNYDER
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Where are we all from ?

- High quality connections
- Connect with the other person's
past, present & future
- Find things in common
- Can you help them?
- Express your wish that they succeed with
their goals for the future

Get Ready for Learning

- **Cognitively Ready**
 - Translation technique
 - Generate questions
 - Try to answer your questions
- **Emotionally Ready**

Plan

- **Part 1 Active concentration and attention - “Boost brain power”**
- **Past 2 Passive concentration and attention - “Mindfulness”**

Part 1 Boost your Brain Power

1. Kindness exercise
2. Neuroscience of attention, concentration & mental focus
3. Strategies & techniques to boost your brain's ability to focus & concentrate
4. Brain training exercise

Exercise

1

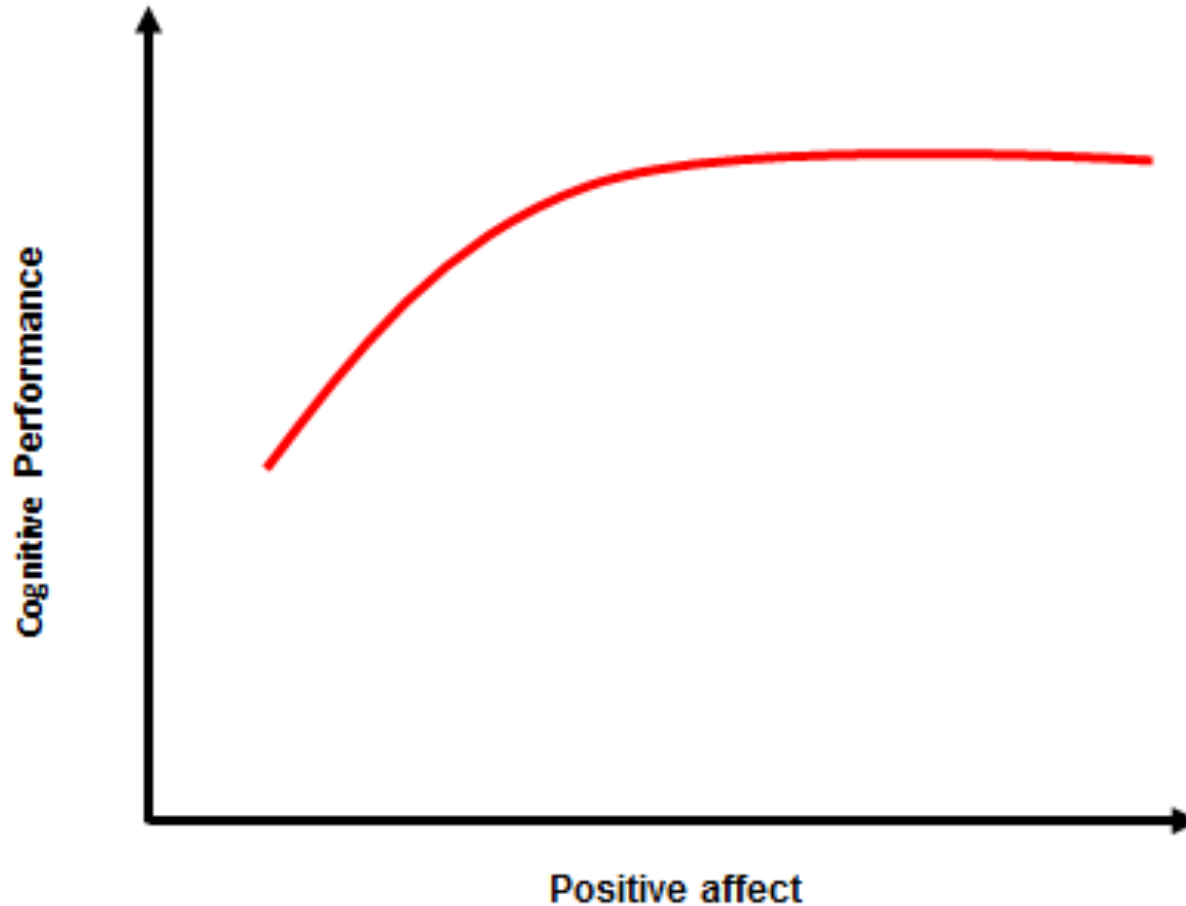
Self awareness

- To maximise your brain's ability to learning you need self awareness
- Key aspect of self awareness is awareness of our **feelings**

Personal dashboard



Positive feelings & cognitive performance



INVITED REVIEW

The influence of affect on higher level cognition: A review of research on interpretation, judgement, decision making and reasoning

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Birkbeck College, University of London, London, UK

In this paper, we examine whether affect influences higher level cognitive processes. We review research on the effect of emotion on interpretation, judgement, decision making, and reasoning. In all cases, we ask first whether there is evidence that emotion affects each of these processes, and second what mechanisms might underlie these effects. Our review highlights the fact that interpretive biases are primarily linked with anxiety, while more general mood-congruent effects may be seen in judgement. Risk perception is also affected by negative and positive affect. Research shows complex effects of emotion on decision making and reasoning, with emotion sometimes hindering normatively correct thinking and sometimes promoting it. There are also important effects of emotion on reasoning style. We discuss key differences between the effects of incidental affect (feeling states not related to the semantic contents of the cognitive task) and integral affect (where the feeling state is caused by or linked to the contents of the cognitive task). In the conclusion, we suggest that focusing on some of the constituent mechanisms involved in interpretation, judgement, decision making and reasoning provides a way to link some of the diverse findings in the field. We also highlight important areas for future research.

Keywords: Emotion; Reasoning; Interpretation; Judgement; Decision-making.

Higher level cognitive processes are characteristically human. Until recently, these processes were studied in a vacuum, separately from the affective system, as if they were immune from such

influence. This partition may have stemmed from early conceptual distinctions between reason and passion, with its implicit hierarchical distinction. More recent approaches propose a dynamic

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*Both authors should be considered joint first authors of this paper.

Psych info search

Positive affect improves working memory: Implications for controlled cognitive processing.

Authors: Yang, Hwajin, School of Social Sciences, Singapore Management University, Singapore, Singapore, hjyang@smu.edu.sg
Yang, Sujin, James Cook University, Singapore, Singapore
Isen, Alice M., Psychology Department, Cornell University, Ithaca, NY, US

Address: Yang, Hwajin, School of Social Sciences, Singapore Management University Level 4, 90 Stamford Road, Singapore, 178903, hjyang@smu.edu.sg

Source: *Cognition and Emotion*, Vol 27(3), Apr, 2013. pp. 474-482.

Page Count: 9

Publisher: United Kingdom: Taylor & Francis.

ISSN: 1464-0600 (Electronic)
0269-9931 (Print)

Language: English

Keywords: working **memory**, cognitive processing, motivation, short-term **memory**, operation span task

Abstract: This study examined the effects of **positive affect** on working **memory** (WM) and short-term **memory** (STM). Given that WM involves both storage and controlled processing and that STM primarily involves storage processing, we hypothesised that if **positive affect** facilitates controlled processing, it should improve WM more than STM. The results demonstrated that **positive affect**, compared with neutral **affect**, significantly enhanced WM, as measured by the operation span task. The influence of **positive affect** on STM, however, was weaker. These results suggest that **positive affect** enhances WM, a task that involves controlled processing, not just storage processing. Additional analyses of recall and processing times and accuracy further suggest that improved WM under **positive affect** is not attributable to motivational differences, but results instead from improved controlled cognitive processing. (PsycINFO Database Record (c) 2013 APA, all rights reserved)

Some ways in which **positive affect** influences decision making and **problem solving**.

Authors: [Isen, Alice M.](#), Department of Psychology and Johnson Graduate School of Management, Cornell University, Ithaca, NY, US

Source: [Handbook of emotions \(3rd ed.\)](#). Lewis, Michael (Ed.); Haviland-Jones, Jeannette M. (Ed.); Barrett, Lisa Feldman (Ed.); pp. 548-573. New York, NY, US: Guilford Press, 2008. xvi, 848 pp.

ISBN: 1-59385-650-4 (Hardcover)
978-1-59385-650-2 (Hardcover)

Language: English

Keywords: **positive affect**, decision making, **problem solving**, thinking, happy people

Abstract: (from the chapter) Similarly, the majority of studies addressing **positive affect's** influence on thinking do not report impaired performance, but rather indicate more flexibility in information-processing strategies, and generally enhanced thinking and **problem solving** whenever a person has reason to engage a **problem** fully. This point was more recently noted by Bodenhausen, Mussweiler, Gabriel, and Moreno (2001), in their summary of the influence of **positive affect** on stereotyping, when they concluded, "Claims that happy people are generally unable or unwilling to engage in systematic thinking appear to be inaccurate. Rather, happy people appear to be flexible in their information-processing strategies (cf. Isen, 1993)" (Bodenhausen et al., 2001, p. 334). Thus one important question will be to try to understand what factors play a role in determining the influence of **positive affect** on performance in different situations, and, more importantly, what processes underlie these influences. This chapter argues that flexibility, rather than superficiality or "playfulness" (both of which have been suggested in the literature), is a better way to characterize the effect of **positive affect** on thinking and decision making. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Positive affect improves creative **problem solving** and influences reported source of practice satisfaction in physicians.

Authors: Estrada, Carlos A., Elmore Community Hosp, Wetumpka, AL, US
Isen, Alice M.
Young, Mark J.

Source: *Motivation and Emotion*, Vol 18(4), Dec, 1994. pp. 285-299.

Page Count: 15

Publisher: Germany: Springer.

ISSN: 0146-7239 (Print)

Language: English

Keywords: **positive affect**, creative **problem solving** & reported sources of practice satisfaction, physicians

Abstract: Investigated whether creative **problem solving** and reported sources of satisfaction from the practice of medicine are influenced by the induction of **positive affect** among physicians. 44 physicians were randomly assigned to the **positive affect** group, a control group, or a statement group. Creativity was measured using the Remote Associates Test. Practice satisfaction was divided into 2 categories, humanistic and extrinsic motivation, with Ss rating each item in these categories on a 7-point Likert scale in response to how important they felt each item was to them. Results showed that the **affect** group received higher creativity scores than the control group while physicians in all groups perceived the humanistic items to be more important for practice satisfaction. Physicians who read phrases reflective of the humanistic satisfactions from medicine did not differ from the control group in the creativity test or in practice satisfaction. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Subjects: *Creativity; *Job Satisfaction; *Physicians; *Positivism; *Problem Solving

Classification: Professional Personnel Attitudes & Characteristics (3430)

Population: Human (10)

Age Group: Adulthood (18 yrs & older) (300)

Methodology: Empirical Study

Format Covered: Print

A brain mechanism for facilitation of insight by **positive affect**.

Authors: Subramaniam, Karuna, Northwestern University, Evanston, IL, US, k-subramaniam@northwestern.edu
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Parrish, Todd B., Northwestern University, Evanston, IL, US
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Address: Subramaniam, Karuna, Department of Psychology and Cognitive Brain Mapping Group, Northwestern University 2029 Sheridan Road, Evanston, IL, US, 60208-2710, k-subramaniam@northwestern.edu

Source: *Journal of Cognitive Neuroscience*, Vol 21(3), Mar, 2009. pp. 415-432.

Page Count: 18

Publisher: US: MIT Press.

ISSN: 1530-8898 (Electronic)
0898-929X (Print)

Language: English

Keywords: insight, **positive affect**, **problem solving**, personality, fMRI, preparation, anxiety, mood, brain

Abstract: Previous research has shown that people solve insight or creative **problems** better when in a **positive** mood (assessed or induced), although the precise mechanisms and neural substrates of this facilitation remain unclear. We assessed mood and personality variables in 79 participants before they attempted to solve **problems** that can be solved by either an insight or an analytic strategy. Participants higher in **positive** mood solved more **problems**, and specifically more with insight, compared with participants lower in **positive** mood. fMRI was performed on 27 of the participants while they solved **problems**. **Positive** mood (and to a lesser extent and in the opposite direction, anxiety) was associated with changes in brain activity during a preparatory interval preceding each solved **problem**; modulation of preparatory activity in several areas biased people to solve either with insight or analytically. Analyses examined whether (a) **positive** mood modulated activity in brain areas showing responsivity during preparation; (b) **positive** mood modulated activity in areas showing stronger activity for insight than noninsight trials either during preparation or solution; and (c) insight effects occurred in areas that showed mood-related effects during preparation. Across three analyses, the ACC showed sensitivity to both mood and insight, demonstrating that **positive** mood alters preparatory activity in ACC, biasing participants to engage in processing conducive to insight **solving**. This result suggests that **positive** mood enhances insight, at least in part, by modulating attention and cognitive control mechanisms via ACC, perhaps enhancing sensitivity to detect non-prepotent solution candidates. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

When you feel good

- Easier to concentrate
- Easier to memorise
- Easier to problem solve & be creative,
- Easier to be motivated and energised
- Easier to use stress & anxiety to become more (rather than less) productive

Thinking kind & compassionate thoughts is a reliable & quick way to increase positive affect

Acting on those kind thoughts further increases positive affect

Exercise part 1

Think of someone you know towards whom it is easy for you to be kind e.g a child or pet



Exercise part 1

Think of someone you know towards whom it is easy for you to be kind

Imagine being kind to them

How does that feel?

Exercise part 2

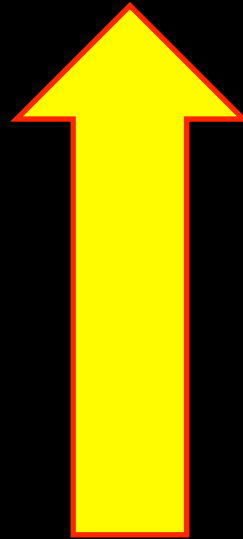
Think of something kind to say to people
either side of you

Exercise part 2-thing you might say

- *We haven't met before, it is really great to meet you*
- *I want you to know that I really appreciate you being my friend*
- *I hope that you do really well in your next essay*
- *I wish you have a really great day tomorrow*
- *I hope that you get a good night's sleep and that you wake up feeling really refreshed tomorrow*
- *I really like the way you make me and others laugh*
- *Is there anything I could possibly help you with*

Kindness leads to

- Oxytocin
- Serotonin
- Dopamine



Oxytocin

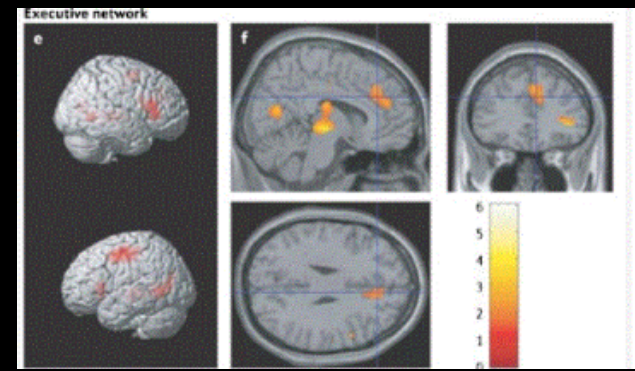
- Neuropeptide/hormone does many things including
- Calm nervous system
- Anxiety ↓
- ↑ PFC functioning = ↑ understanding & memorisation.
- ↑ resiliency
- ↑ heart efficiency

Serotonin

- Neurotransmitter involved in many systems –play a role in:
- ↑ Positive feeling
- ↑ Memory & learning
- ↑ Sleep quality

Dopamine

- Neurotransmitter involved in many systems –play a role in:
- ↑ positive feeling
- ↑ Attention, concentration, mental focus due to
- ↑ activity in (dopamine reliant) executive attentional network



Thinking kind thoughts & acting kindly enhances positive feelings, which prepare your brain for optimal learning

Neuroscience of attention, concentration & mental focus

2

Definitions

- ATTENTION = Focusing on thing whilst ignoring other things
- CONCENTRATION=same as above but with *intensity*
- MENTAL FOCUS
 - Constant mental focus
 - Shifting mental focus

Definitions

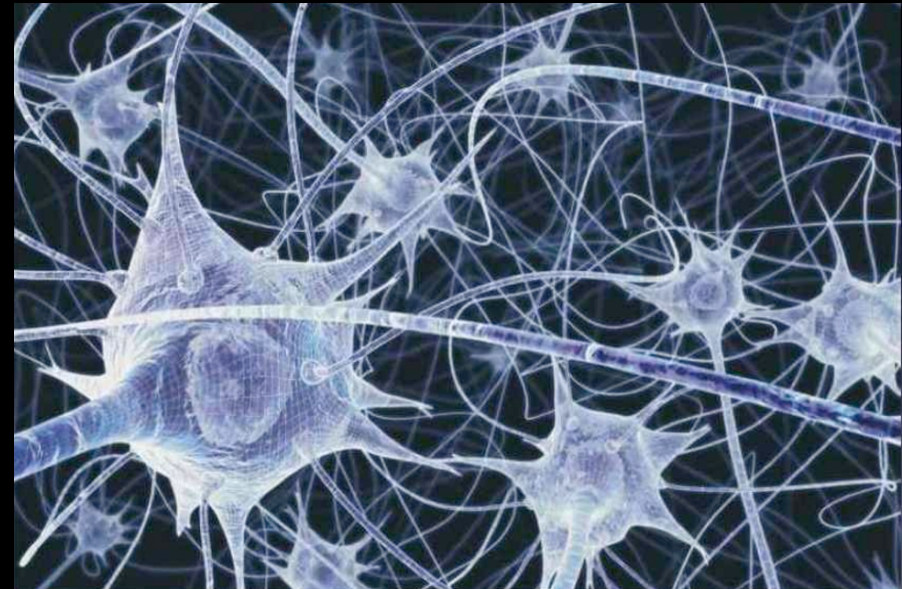
- EFFORT & ENERGY required for constant mental focus, concentration require
- BRAIN POWER= capacity for mental effort & energy. NB not scientific term.

Definitions

Everyone knows what attention is. It is the taking possession of the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects of trains of thought. Focalization, concentration of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others, and is a condition which has as its opposite in the confused, dazed, scatterbrain state (William James 1890)

Neural networks

- Different activities/tasks requires excitation of nerve cells in many separate areas of the brain
- Areas are connected up via networks of nerve cells.
- Many different networks in your brain



Neuroplasticity

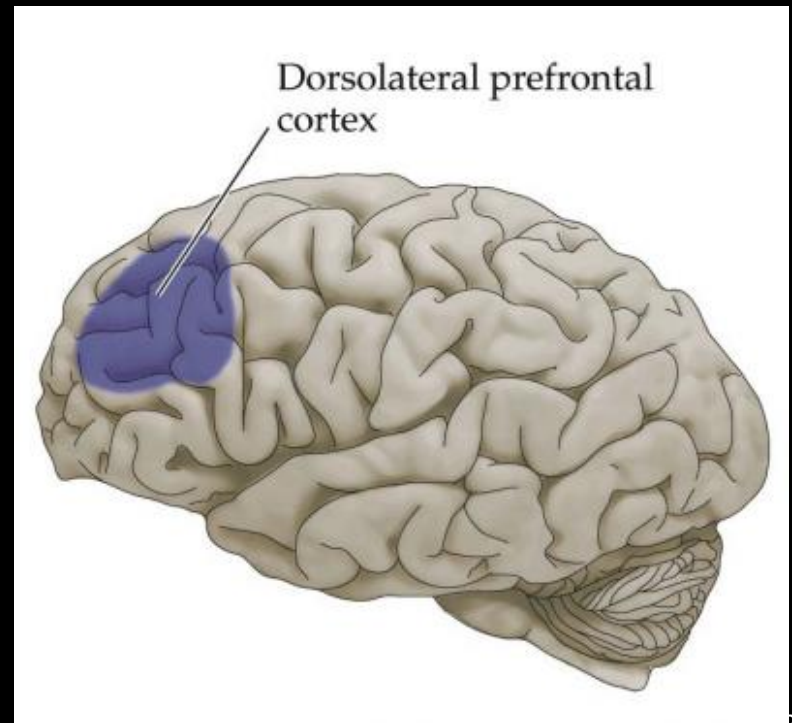
- Networks can be modified & grow
 1. New nerve cells (in certain parts only)
 2. New connections
 3. Improved existing connections
 4. Connection and cells can weaken & die
- Repeated activation of a network
 - network growth
 - improved task performance

How your brain controls attention & mental focus

- Brain can only attend to limited amount of information at any one time
- Attentional spotlight
- 3 networks control what you attend to
 - I. Executive attentional network
 - II. Orienting attentional network
 - III. Alerting attentional network

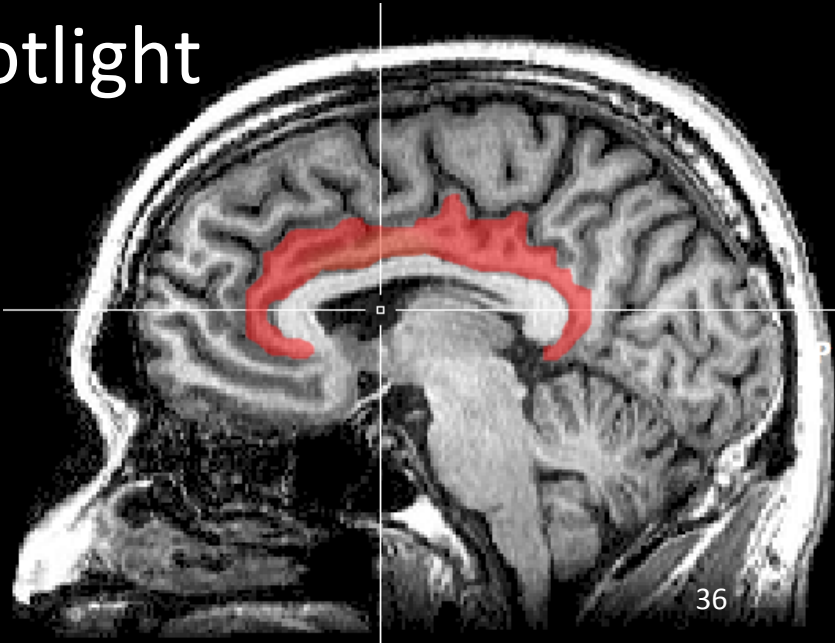
Executive network

- You control
- Stronger = better able to concentrate & keep mental focus
- Pre frontal cortex, PFC



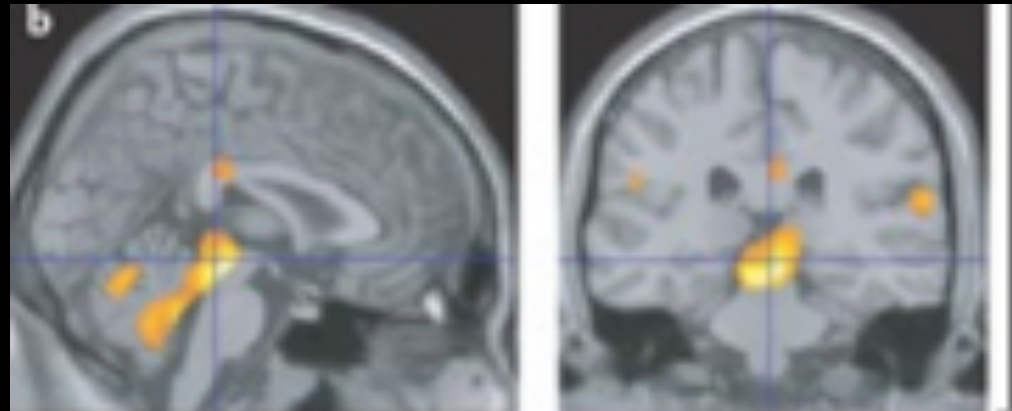
Orienting network

- Works with the executive network
- "the manager/personal assistant"
- Activates other relevant networks for specific task
- Moves the attentional spotlight
- ACC
 - anterior cingulate cortex

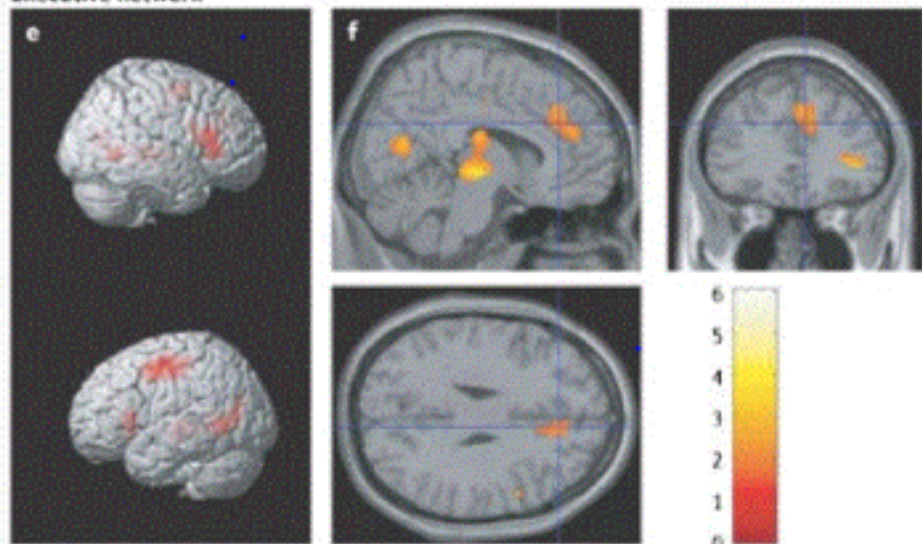


Alerting network

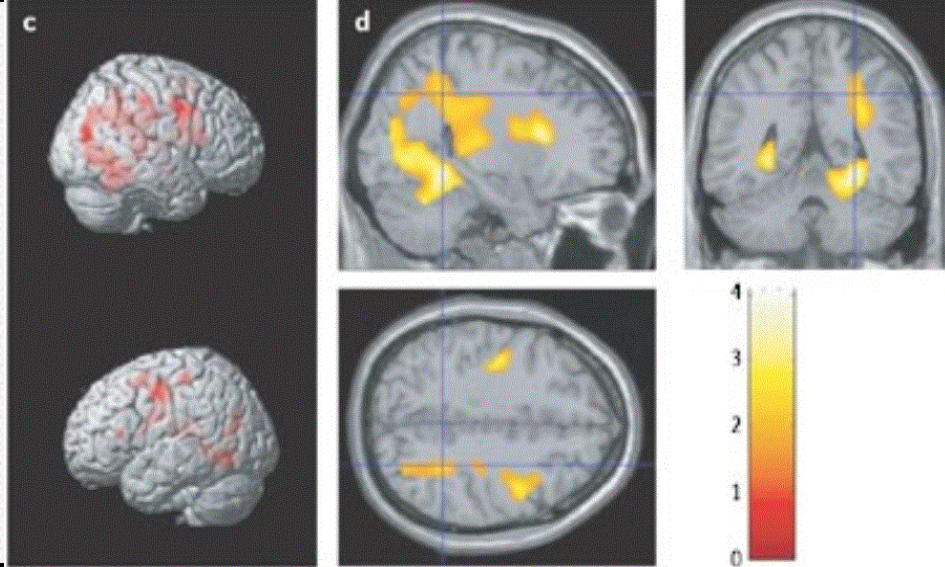
- Constantly monitor income data
- Knock out the executive & orienting networks
- You are not in control-reflexive



Executive network

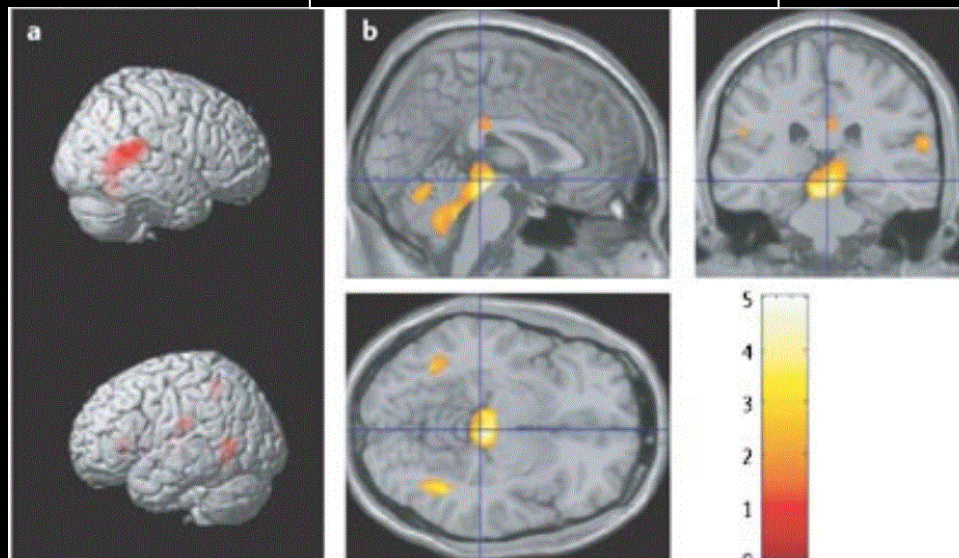


Executive



Orienting

Alerting



Executive



Orienting



Alerting

Strategies to enhance attention & concentration

3

What things do you already do to enhance your attention, concentration and mental focus and avoid distractions?

As a group decide what are

- Your top 4 brain boosting/concentration boosting things?
- 4 things that most weaken brain power & shift your attention away from work
- Draw out results of your discussion on the tables

Strategies to enhance attention & concentration

- Guiding principle for strategies to enhance attention & concentration is
- ↓ activation of Alerting network ↓
- ↑ activation of Executive & Orienting network ↑

↓ Activation of Alerting Network ↓

- ↓ Distraction E.g.
- Switch off mobile phone
- Log out of social media sites
- Log out of email programme
- Some people work better w background noise/others work better without
- Earplugs



↓ Activation of Alerting network ↓

- ↓ internal distractions
- Emotional distractions

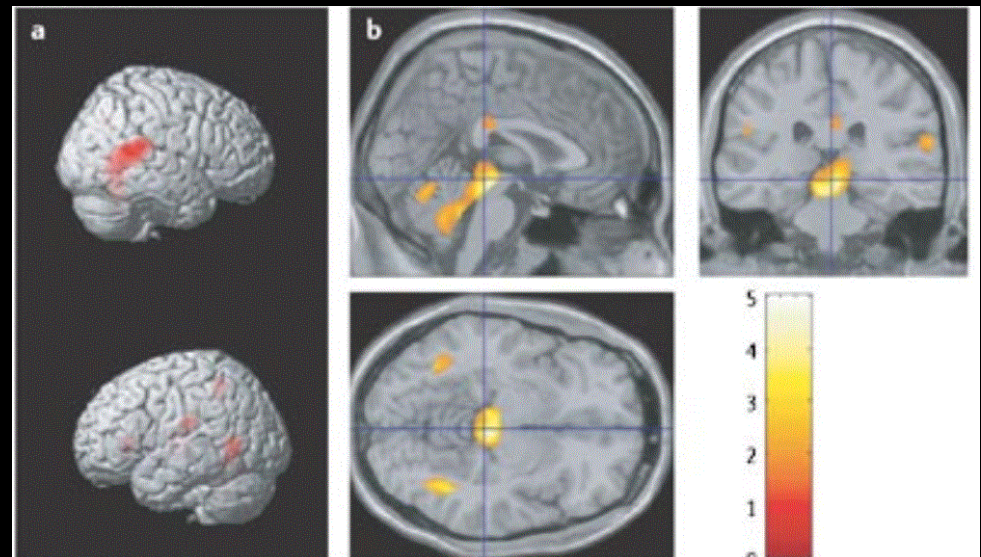
I. Label

II. Express

III. Decide

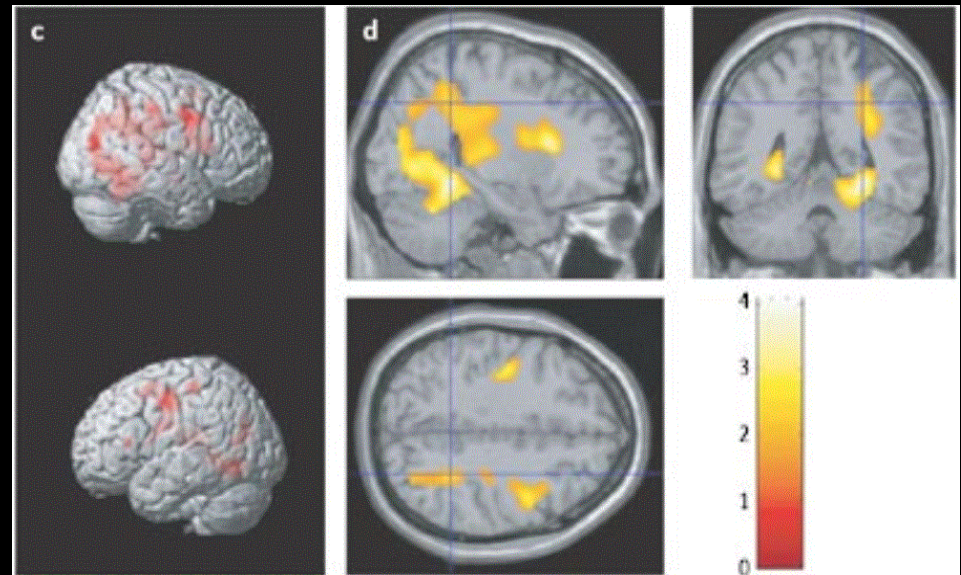
IV. Action

LEDA



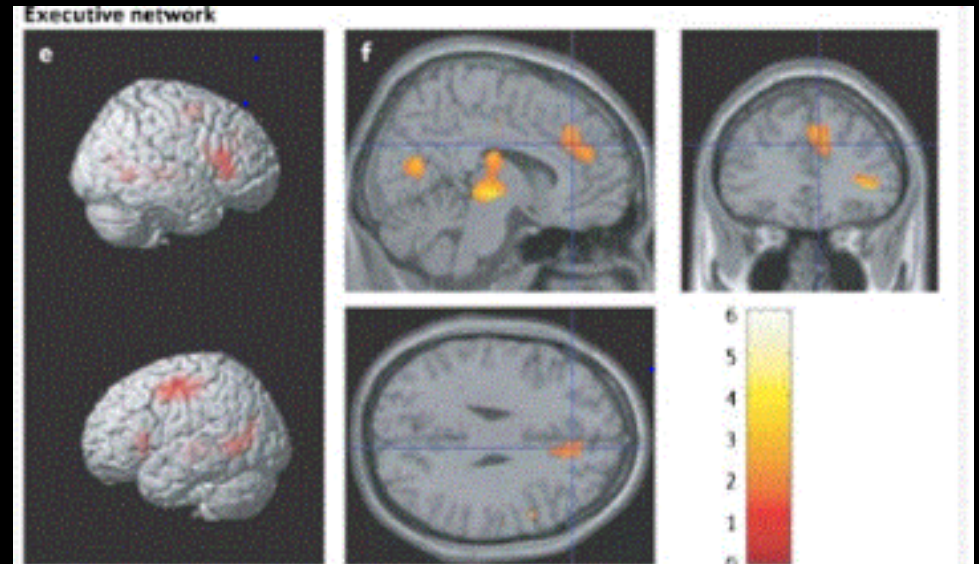
Supporting the Orienting Network

- Look for the details technique
- Ask questions (again)



Supporting the Executive Network

- Eat Well
- Sleep and Rest and take breaks
- Do Exercise



Look after brain & body-Eat well



Look after brain & body- Hydrate
frequently



Look after brain & body-Exercise



Look after brain & body-Exercise



Look after brain & body-Exercise

- **Healthy cardiovascular system required for optimal mental performance and mental stamina**
- **Reduces stress**
- **Makes you feel good**
- **Helps to maintain focus and concentration whilst studying**
- **Helps you to sleep well**



Look after your brain & body-Sleep



Look after your brain & body-Sleep

- Sleep 8 hours night
- it is during sleep that new memories are consolidated.
- Sleep prepares your brain for effective learning the following day-.
- Sleep helps your brain to make connection between new information learnt previous day.
- sleep makes you less emotional & stressed

Look after you brain & body-

Manage Stress

1. Practical approach: implement all of the above
2. Psychological approach:
 - Express your worries: write them out
 - Argue against negative thoughts
 - Visualise success & visualise overcoming difficulties successfully
 - Use positive affirmations

Positive Affirmations

I'm enjoying the challenge of preparing myself to do well in my exams!

I know that staying cool and calm makes me a more effective learner.

I love studying my subject and developing excellent exam technique!

I'm focussed and calm now and at all time.

I'm going to ace these exams!

Video on the Neuroscience behind Attention

[https://www.youtube.com/watch?
v=lg0k2QfU5ME](https://www.youtube.com/watch?v=lg0k2QfU5ME)

4

Everyday object exercise

- Take an everyday object
- Ask questions about it and just think about the object and nothing else
- Everytime your mind gets distract bring it back to the object
- Do this everyday for 5 minutes

Part 2

- Passive concentration
- Mindfulness

Success on your course



(Desire x Belief) x (Effort) Time

x (Resources x Knowledge x Skills)

= SUCCESS

Study
Skills

Academic
Success

Study Skills

Core Success Skills

E.G.

DISCIPLINE

QUESTIONING

E.G.

CONCENTRATION

SELF-AWARENESS



Self-awareness leads to

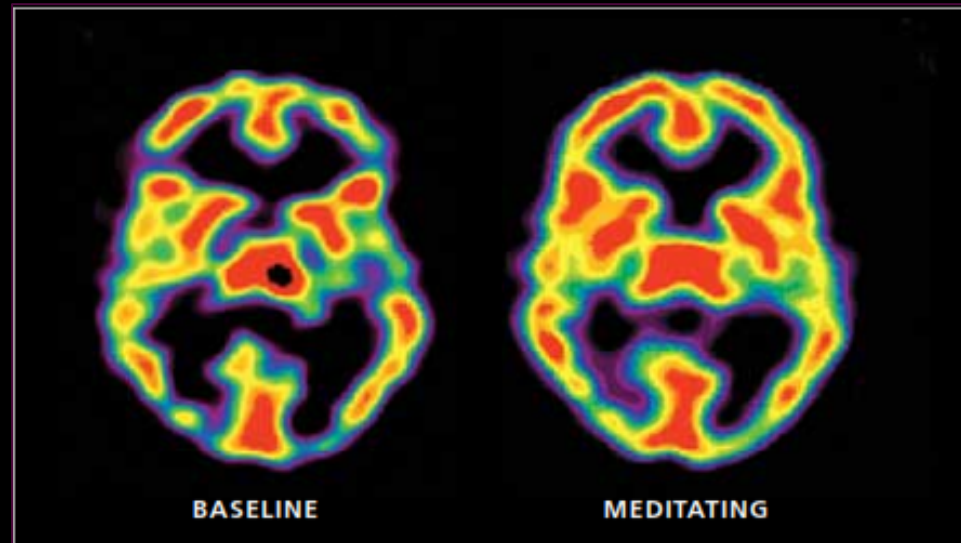
- better stress management
- better physical and emotional health
- better well-being and happiness
- better performance and productivity

Mindfulness = Self-awareness

Mindfulness means turning your attention inwards and observing what is going on for you in the present moment with an attitude of acceptance, curiosity and non-judgment

Mindfulness Changes the Brain

- Strengthens executive and orienting attentional networks (Dorgee 2014)
- ↑ ability to concentrate, sustain attention and select relevant information (Tang 2007, Jha et al 2007, Jensen et al 2012)

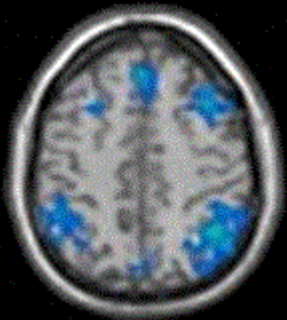


Video on the Neuroscience behind Mindfulness

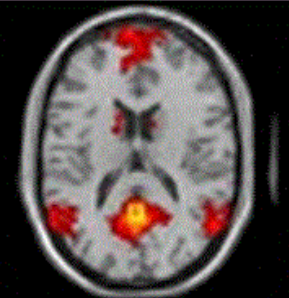
- <https://www.youtube.com/watch?v=QrUasFwjcvk>

Your brain has 2 thinking/ experiencing modes

Actively thinking
Direct experience



Not pursuing
thoughts in
focussed way
Mind wandering



Default mode network

Default narrative network

- Some thought patterns, ruminations, worries, interpretation, negative self-talk

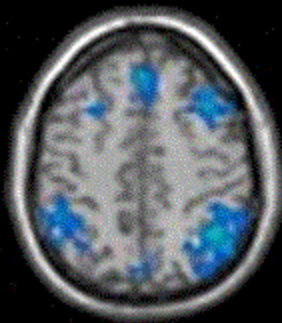
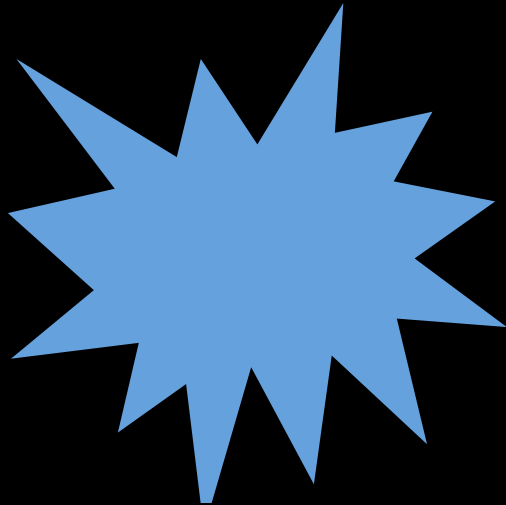
contribute to

- Stress
- Anxiety
- Low self-worth
- Self-criticism
- Depression



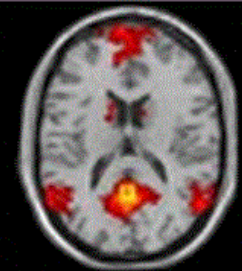
Mindfulness

**↑ Activation in networks for
active thinking & self
awareness**



**Disengages us from &
↓ activation in default
narrative network**

(Brewer et al 2011)



Default mode network

Mindfulness Impact Studies

- Robust evidence ↓depression, ↓anxiety & ↓pain (Goyal et al 2014)
- Strong evidence of +ve correlation with well-being & -ve correlation with stress (Dorjee 2014)
- Evidence of ↑ attention, concentration, self awareness, emotional control, compassion, reasoning, decision making, short term memory, reaction times, mental & physical stamina,

How to do it

- 1) Sit upright
- 2) Focus on the sensations of the body briefly
- 3) Focus on sensation of Breathing
- 4) Count the out-breath 1-10
- 5) Observe, notice with attitude of acceptance, curiosity & kindness what comes up. It is not about quieting the mind, it is about listening-in & not responding.



Good Luck !

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Books you may find useful

Adren, J.,B. 2010 *Rewire Your Brain*. John Wiley & Sons. Hoboken.

Brown. J., Fenske. M., Neporent.L., 2010. *The Winner's Brain*. De Capo Press. Cambridge MA.

Fox, E., 2013. *Rainy brain, sunny brain: the new science of optimism and pessimism*. Arrow Book, London.

Fredrickson, B., 2011. *Positivity*. Oneworld, Oxford

Markman.A. 2012 *Smart Thinking. How to Think Big, Innovate and Outperform Your Rivals*. Piatkus. London.

Books you may find useful

McGonigal. K. 2012 *Maximum Willpower. How to Master the New Science of Self-Control* MacMillian. London.

Medina, J.J., 2009. *Brain Rules. 12 principles for surviving and thriving at work, home and school.* Pear Press, Seattle.

Rock, D., 2009. *Your brain at work: strategies for overcoming distraction, regaining focus, and working smarter all day long.* Harper Business, New York.

Sinfield., S., Burns.T., 2012 *Essential study skills: the complete guide to success at university,*. SAGE, London.

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