

The NeuroScience of Decision-Making

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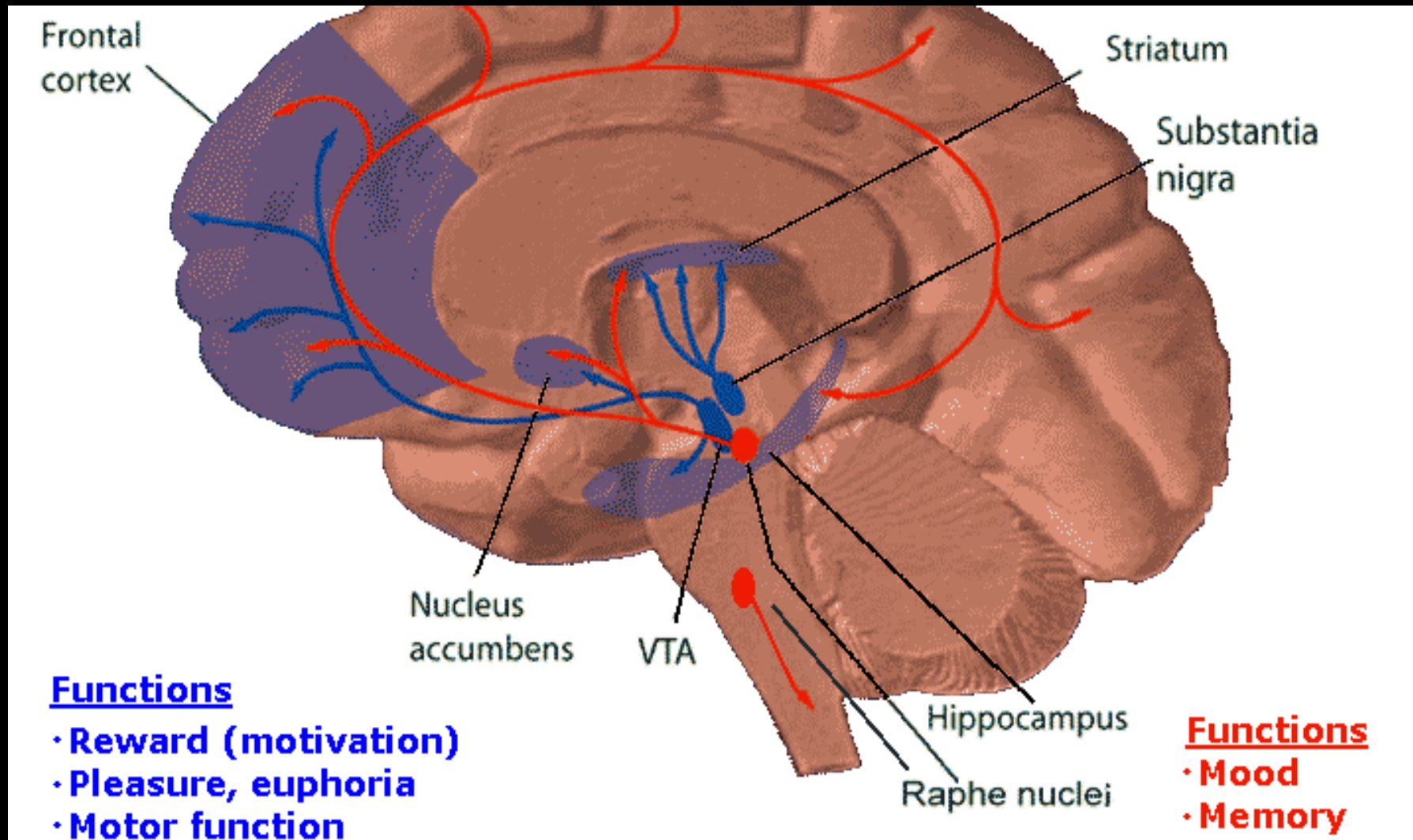
Scope

- Anatomy and Physiology of the brain and how it relates to executive function
- Internal and external influences on brain function in decision making
- Some Dos and Don'ts
- The 7 Questions

The Task

- How do we adaptively adjust our immediate behaviour, in the face of environmental uncertainty, to reach our long-term goals?
- How does the brain reconcile shifts in external stimuli, inhibiting unimportant ones in order to focus on the goal?
- How do we integrate past and current information, and project long-term consequences of immediate action?

Where does all this happen?



How does this happen?

- Main area is prefrontal cortex
- Receives input from other parts of the brain, eg the limbic system and parietal and temporal lobes
- These areas provide input about the external (sensory) world, and the internal (emotional) world
- Messages carried via neurotransmitters eg dopamine, serotonin and noradrenaline

How does this happen(2)?

- Once pre-frontal cortex has processed the information and reached a conclusion, it then activates the rest of the cortex to initiate action

So, what affects this process?

- Structural problems, e.g. infarcts from strokes, pressure from tumours
- Internal influences over the neurotransmitters that carry messages to and from the prefrontal cortex, e.g. moods(happy, sad, anxious), emotions(love, sexual arousal, anger) and metabolic states(blood glucose and urea levels)
- External influences over neurotransmitters, e.g. alcohol, drugs(prescribed and otherwise)

Do:

- Obtain information
- Sift out the relevant from the irrelevant
- Integrate current and previous information
- Consider both short and long term consequences
- Look after your physical health
- Unless absolutely unavoidable, take your time

Don't:

- Rush, unless absolutely necessary
- Take decisions in the throes of emotional upheaval
- Make decisions under the influence of alcohol or drugs
- Underestimate the value of good physical health

The Combat Estimate

- What is the situation, and how does it affect me?
- What have I been asked to do and why?
- What effect do I need to achieve?
- Where can I best achieve the desired effect?
- What resources do I need?
- How do I best synchronise the desired effects
- What control measures do I need to impose?

Thank you for your attention