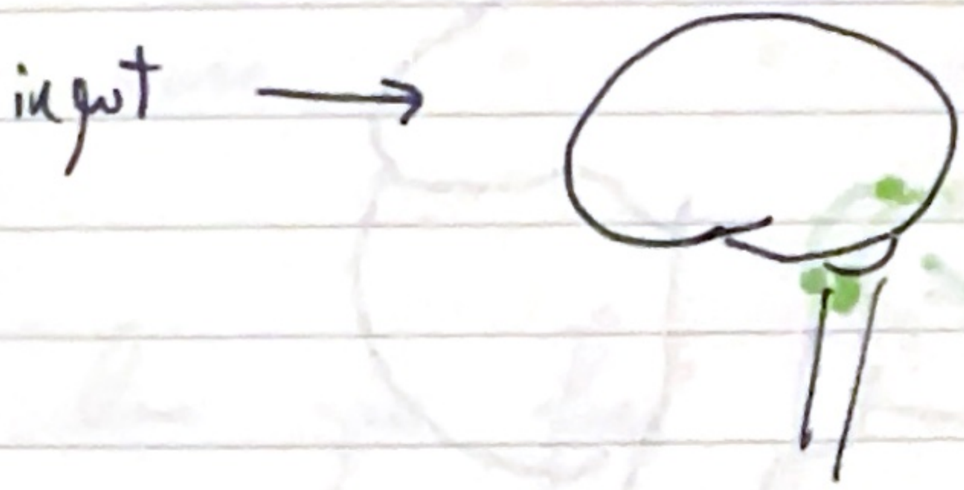
THE NEUROSCIENCE OF DECISION MAKING

→ American brain tumor Association — Sept '24

→ KENNETH KISHIDA — inspiration = Matrix

How we make decisions ?



- fMRI
- direct measurements
- human voltammetry
- other intracranial recordings — stereo-EEG
- MEG (magneto-encephalography)

HUMAN VOLTAMMETRY

Observed dopamine measurements in humans using a machine learning based approach to fast scan cyclic voltammetry

↓ or other motor conditions rigidity

Pts w/ Parkinson alleviate motor symptoms with an electrode in brain

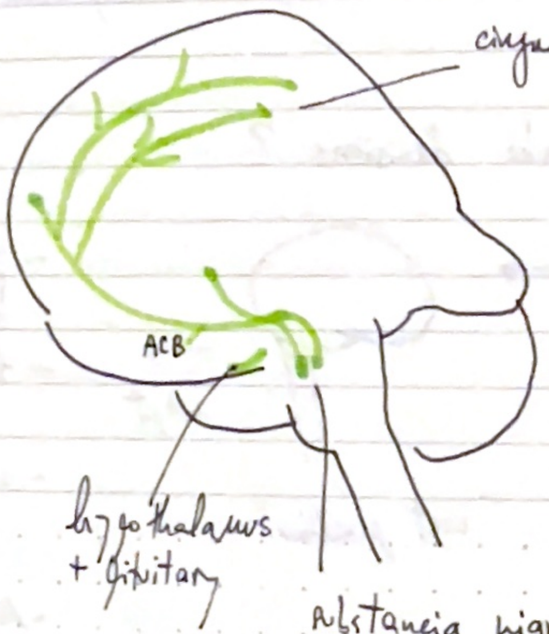
↓

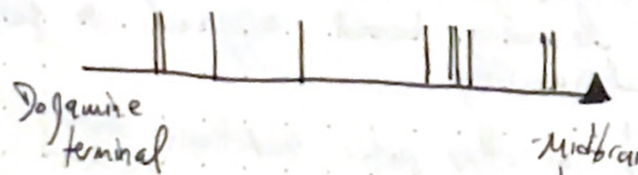
then attached to pacemaker → for the rest of life

neurosurgery needed — patient awake

↑ WIN

playing stockmarket investment game





$S^p(t)$ (1996)

Dopamine → teaching signal

↓

neuromodulatory signal

reward prediction error

allows brain to adapt

→ better than expected → ↑ dog

→ worse " " → ↓ "

Computing how you feel

→ then → where ~~are~~ is this happening in the brain?

↓

fMRI

→ levels of arousal

↓

widespread / sometimes overlapping

many brain regions interacting

+

networks

doing feelings

other

disgusting image

↓

they can predict if people are ← liberal conservative

↓

they process the image in ≠ ways

social influence + problem solving

Amygdala ↑ in setting

(emotion, fear, anxiety)

pre frontal cortex ↓activity

tone habituate:

↓ amigdala activity

↑ pre frontal "

→ better solving problem

set up: (solving problems, and interacting at the same time)

↓

better than expected in social rank

↓

"reward prediction error"

implicit competitive setting → ♀ more susceptible

⇒ Group interactions can really change the ability of problem-solving

⇒ If groups are cooperative → ♀ do better

⇒ Mindfulness dampens impulsive reactivity