Week 1

What is neuropsychology?
Neuropsychology studies the structure and function of the brain as they relate to specific psychological processes and behaviour

Important indicators of abnormality

- Behaviours necessary to stay alive
  - Eating
  - Sleeping
  - Social/emotional interactions
  - Exercise
- Cognitive behaviours
  - Attention
  - Educational performance
    - Tends to be accompanied by attentional problems and social anxiety (especially in children)

Ways to observe the signs of disorders

- Body language
- Eye movements
- Physiological sings (e.g. signs of autonomic nervous system activity)
- Reaction time (e.g. verbal, motor, perceptual)
- Attentional readiness and rate of information processing

Attention

- Usually visually driven in primates and higher order mammals (eye movements)
- Deciding what is semantically important to you
- Trained
- Withdrawal from some things in order to focus on others
- Stimulus driven attention - Salience (William James)
  - Involuntary attention to the immediate sensorial stimuli
- Dorsal visual streams
  - Visual-motor action pathway
  - Carries attention
  - Driven by fast M fibres
  - Made of 3 pathways
- Right hemisphere is more dominant than the left

Week 2

Attention and anxiety

Dorsal and ventral stream (visual stream)

- Dorsal stream: conscious vision
    - Visual thalamus: lateral geniculate nucleus
    - Posterior parietal and frontal cortex
    - Vision for action
    - Faster
    - Shifts eyes to where something is moving
    - Goal directed shifts in attention
    - Bigger on the right side of the brain
    - 'where is it?'
- Ventral stream
    - Stream for perception
    - 'what is it?'
    - naming objects
    - temporal lobe
    - slightly larger on the left side of the brain
        - more focused on language

Control of attention

- attracted by unexpected events
    - movement
    - salience (new coloured, food)
    - behavioural relevance
- right hemisphere is dominant in control of attention
    - structures in the brain controlling attention are larger on the right hemisphere

Information processing and attention

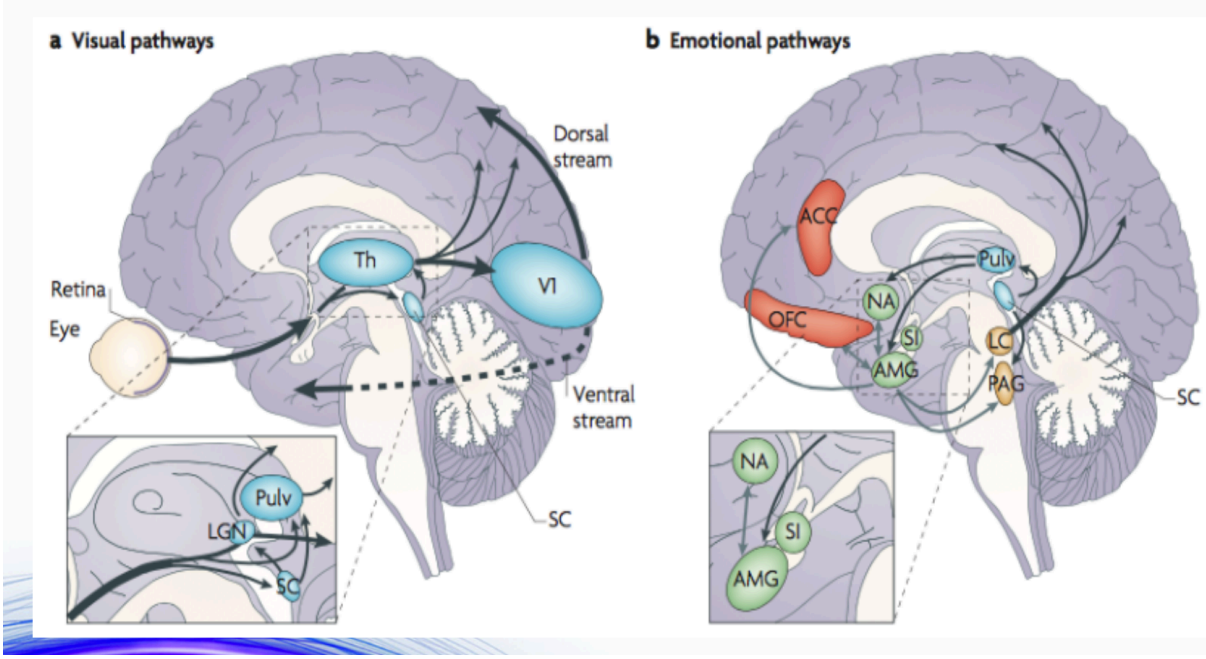
- attention alters the rate of information processing
- information that you attend to goes into the brain through the parietofrontal area
- emotional response effects attention and therefore rate of processing
    - this is why we look at faces first (we must decide whether new faces are friendly or threatening)
- fatigue and illness decrease rate of saccade activation (eye movement) and information processing
    - attention is therefore restricted
    - when in a bad mood, we have more limited attention and can't process information as quickly as normal
- Depression and anxiety are correlated with neuroinflammation
    - You behave in a similar way to when you have the flu in terms of attention
- Time to activation in anxiety and depression
    - Depressive disorders cause the brain to activate slower
    - Anxiety disorders cause the brain to activate quickly and shift attention quickly

Parts of the brain responsible for attentional and emotional behaviours

- Consciousness: left hemisphere
- Unconscious behaviours: right hemisphere

- Emotional stimuli are prioritised even when we are doing a task

Visual pathways versus emotional pathways



Brain oxytocin and vasopressin

- Regulators of anxiety, stress-coping and sociality
- Released within hypothalamic and limbic areas
- Oxytocin
  - Reduces anxiety (anxiolytic) and depression (anti-depressive)
- Vasopressin
  - Contributes to anxiety and depression (anxiogenic and depressive actions)
- A balanced activity of these neuropeptides is important for normal emotional behaviour

Anxiety in Autism Spectrum Disorder

- Predictors of anxiety in ASD samples
  - Atypical sensory function
  - Alexithymia (difficulty understanding and labelling emotions)
  - Intolerance of uncertainty (critical mediator for anxiety in ASD)
- Disruption in connections between the medial prefrontal cortex, limbic system, and insula-based networks

Eating disorders

Anorexia/starvation

- Excessive weight loss and disturbed body composition
- Restrictive eating behaviour
- State of semi starvation or complete starvation