



Knowledge Organiser: Year 11 Psychology; BRAIN AND NEUROPSYCHOLOGY

<u>STRUCTURE AND FUNCTION OF THE NERVOUS SYSTEM</u>		1	<u>AUTONOMIC NERVOUS SYSTEM</u>		2	
THE NERVOUS SYSTEM: • Collects and responds to information • Co-ordinates organs including the brain FUNCTIONS OF THE NERVOUS SYSTEM: Central nervous system: • Brain – conscious awareness and decision making • Brain stem – automatic functions Peripheral nervous system: • Information from outside world to CNS • Information from CNS to muscles Autonomic nervous system: • Automatic functions e.g. breathing, heart rate Somatic nervous system: Voluntary movements of muscles			HOMEOSTASIS: • Maintains a balanced internal state by monitoring activity of the organs AN AUTOMATIC SYSTEM: • No conscious control because the functions are vital for life SYMPATHETIC NERVOUS SYSTEM: • Physiological arousal triggered when stressed and leads to fight or flight PARASYMPATHETIC NERVOUS SYSTEM: • Opposite to sympathetic, produces rest and digest response			
<u>FIGHT OR FLIGHT</u>			3	<u>THE JAMES-LANGE THEORY OF EMOTION</u>		4
• Hypothalamus identifies a stressor which triggers the sympathetic division • As sympathetic nervous system is triggered, adrenaline is released • Fight or flight response is immediate and body goes through physiological changes e.g. increased heart rate • Once the threat has passed, parasympathetic is triggered (rest and digest)				PHYSIOLOGICAL AROUSAL FIRST: • Adrenaline is released into the body EMOTION AFTERWARDS: • Brain interprets physiological activity which causes emotion NO PHYSICAL CHANGES = NO EMOTION EVALUATION: + Emotions do come after arousal – particularly in the case of phobias. - Challenged by Canon-Bard theory – some emotions occur at the same time as physiological arousal		
<u>NEURONS AND ELECTRICAL TRANSMISSION</u>						5
TYPES OF NEURON: • Sensory – from PNS to CNS • Relay – connect sensory to motor • Motor – from CNS to muscles		STRUCTURE OF NEURONS: • Cell body • Axon • Myelin sheath • Terminal button		ELECTRICAL TRANSMISSION: • Resting state – negative charge • When firing, charge inside the cell changes which causes an action potential		

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- Low serotonin effects thinking and behaviour

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NEUROLOGICAL DAMAGE

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THE IMPORTANCE OF LOCALISATION:

- Damage of specific areas of the brain affect certain behaviours.

THE EFFECTS OF STROKE:

- When areas of the brain are deprived of oxygen they die, which leads to effects on behaviour.

EFFECTS OF NEUROLOGICAL DAMAGE ON MOTOR ABILITY:

- Damage to motor area can impair movement.

EFFECTS OF NEUROLOGICAL DAMAGE ON BEHAVIOUR:

- Broca's aphasia
- Wernicke's aphasia

TULVING'S GOLD MEMORY STUDY

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AIM: To investigate if episodic memories produce different blood flow patterns to semantic ones

METHOD: Six participants injected with radioactive gold. Monitored blood flow using PET scans

RESULTS: Different blood flow in 3 out of 6 patients

Semantic memories in posterior cortex and episodic memories in anterior cortex

CONCLUSION: Episodic and semantic memories are localised

Memory has a biological basis

EVALUATION:

- + Objective evidence – evidence from brain scans is difficult to fake, producing unbiased evidence
- Sample issues – only six participants included

SCANNING TECHNIQUES

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CT SCANS:

- Large doughnut shaped scanner that rotates
- Takes lots of x-rays of the brain

PET SCAN:

- Patient injectes with radioactive glucose
- Brain activity shown on computer screen

FMRI SCAN:

- Measures a change in oxygen levels
- Displayed as a 3D computer image

EVALUATION:

CT SCANS:

- + Higher quality
- High levels of radiation

PET SCANS:

- + Shows brain in action
- Unethical because of radiation

FMRI SCANS:

- + Produces clearer image with no radiation
- Expensive

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