

CONTENT: BIOLOGICAL LEVEL OF ANALYSIS: LOCALISATION OF BRAIN FUNCTION

Use the learning experience to better understand the content learning outcomes of:

- **localisation of brain function** (bio)
- **Neuroplasticity** (bio)
- Biological correlates of **memory formation** (Learning and Memory Context)

Key Research: [Maguire et al. 2000](#)

Research Aim: To understand the environmental impact on localised neuroplasticity and the localised role of the hippocampus in visual spatial memory formation

Summary and Key Findings: Maguire and her colleagues conducted a quasi experiment in which she and her team acquired a sample of male London taxi cab drivers and compared MRI brain scans to another sample of male non-taxi drivers. The researchers found that the **posterior hippocampi** of the taxi drivers was statistically significantly larger compared to the non taxi drivers.

Why this matters: This is significant because it demonstrates that specific localised brain regions can undergo neurological growth as a result of an environmental stimulus. Prior research has established the posterior hippocampi as an area of the brain associated with visual spatial memory.

APPLICATION and ANALYSIS

Your task is to consider the strengths and limitations of Maguire's research as well as consider the strength and limitations of a **reductionist approach** to biological research.

1. Identify 2-3 possible **confounding variables** present in Maguire's research?
2. What are the **real world implications** of these findings? What might this study inform us about neurological development and therapy?
3. What are the advantages and disadvantages of a **reductionist approach** to understanding human behaviour?