

The image features a purple rectangular logo in the top left corner with the text 'MANCHESTER' in white serif font and '1824' in yellow serif font below it. The background is a photograph of a university campus. A wide, paved path leads from the bottom left towards the center. To the left of the path is a green lawn with several large, leafy trees. To the right of the path is another green lawn. In the background, there is a modern building with a glass facade and a red roof, and a traditional stone building with a large arched entrance. The sky is blue with some clouds, and the sun is shining from the top right corner, creating a lens flare effect.

MANCHESTER
1824

The University of Manchester

BIOL21332 Motor Systems

Three Types of Motor Behaviour

Type 1: **Reflexes** or Reflexive Movements

Reflexes are involuntary. They happen unconsciously and consist of organised patterns of muscle contractions and relaxations that are usually elicited by a peripheral stimulus.



Reflexes

Different reflexes involve various spatial and temporal patterns of muscle contractions. These depend on both the type of sensory receptors stimulated and the strength of that stimulation. (warm versus hot plate!)

Receptors in muscles produce stretch reflexes while cutaneous receptors produce withdrawal reflexes.

Spinal reflexes are often used clinically to help check the functioning of the afferent and efferent pathways.

We will cover reflexes more in Spark Pages 1-4.

Three Types of Motor Behaviour

Type 2: **Rhythmic** Movements

Rhythmic motor patterns include breathing, swallowing, swimming and at least for some people dancing! Rhythmic movements often involve alternating contractions and relaxations of muscles on either side of the body.



Rhythmic

Rhythmic motor patterns are controlled by circuits that primarily reside in the **spinal cord**.

They can occur spontaneously for example via voluntary control. The underlying spinal cord circuits are, however, often entrained by a peripheral stimulus.



Three Types of Motor Behaviour

Type 3: **Voluntary** Movements

Voluntary movements are self-initiated. They are under our conscious control.



Voluntary movements

Voluntary movements are generally used to accomplish a particular task for example typing out a text message to a friend.

Voluntary movements may also be triggered by an external event – for example braking when approaching a red light or moving to position yourself to catch a ball.

The main distinction between voluntary and other forms of movement is that voluntary movements **get more accurate with practice** as one learns to predict how the world interacts with your body (for example a toddler learning to walk).