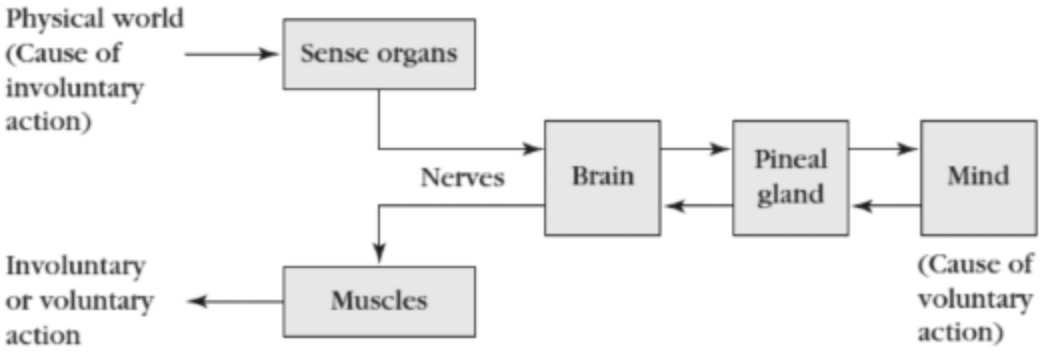
History, Elicited Behaviour, Habituation & Sensitisation Summary

Historical Antecedents:

- René Descartes:
  - Before Descartes: View was that human behaviour is entirely determined by conscious intent and free will – nothing was automatic.
  - Cartesian Dualism – Two classes of human behaviour (body and mind):
    - Involuntary: Automatic reactions to external stimuli and is mediated by reflexes.
      - Assumed that all animals only had this type of behaviour.
    - Voluntary: Does not have to be triggered by an external stimuli and occurs because of the person's conscious intent to act in that particular manner.
      - Did not believe that the mind functioned in a predictable and orderly manner.



  - Nativism: Philosophical idea that we are all born with innate ideas about certain things.
    - Believed you must study:
      - Mentalism
        - Thought the contents of the mind eyes were:
          - Partly from the body → sensory experience.
          - Partly innate – born with some ideas.
      - Reflexology

- John Locke:
  - Empiricism: Humans are born without any preconceptions about the world and their mind was gradually filled with ideas and information as a person encountered various sense experiences.
    - Association: A connection between he representation of two events such that the occurrence of one of the events activates the representation of the other.
      - Primary Rules:
        - Contiguity: If two events repeatedly occur together in space or time, they will become linked or associated.
        - Similarity: Things that are similar become associated.
        - Contrasting characteristics: Things that are very dissimilar become associated.
      - Secondary Rules:
        - Intensity: More intense stimuli become associated more easily.
        - Frequency: Stimuli that are paired together more frequently become more easily associated.
        - Recency: Stimuli that have been paired together more recently become associated.
      - Ebbinghaus:
        - Nonsense Syllables: Three letter combinations devoid of any meaning that might influence how someone might react to them.

- Thomas Hobbes:
  - Hedonism: People do things in pursuit of pleasure and avoidance of pain.
  - Believed that the mind operated just as predictably as a reflex.

- Reflex:
    - I. M. Sechenov: Proposed that stimuli did not elicit reflex responses directly in all cases, but a stimulus could release a response from inhibition.
        - Even small intensity stimuli can lead to response.
            - Voluntary behaviour may be result of inconspicuous stimuli.
            - Therefore, reflexes may account for all behaviour.
    - Ivan Pavlov: Not all reflexes are innate. New reflexes to stimuli can be established through mechanisms of association.

Modern Era:

- Comparative Cognition and the Evolution of Intelligence:
    - Charles Darwin: Believed that animals also had a mind had the capacity of wonder, curiosity, imitation. Memory, reasoning and attention; just like the human mind.
    - George Romanes: Proposed that intelligence be identified by whether an animal learns to make new adjustments or to modify old ones in accordance with the results of its own individual experience.
- Functional Neurology:
    - Ivan Pavlov
    - Nervism: All key physiological functions are governed by the nervous system.
- Animal Models of Human Behaviour:
    - Dollard and Miller
    - The belief that research with nonhuman animals can provide information that may help us better understand human behaviour.
    - Animals are used as models and are not seen to be the same as humans. Such models permit investigation of certain aspects of what they represent under conditions that are simpler, more easily controlled and less expensive.
    - What makes a model suitable and valid?
        - Relevant Features: Must identify what features or functions of the real object is one most interested in.
        - Identify the relevant points of similarity between the animal model and the human behaviour of interest.
- Animal Models and Drug Development.
- Animal Models and Machine Learning:
    - Robots: Machines that are able to perform particular functions or tasks.
    - Prominent approach of reinforced learning originated in behavioural studies of animals.

Learning:

- Definition: An enduring change in behaviour involving specific stimuli or responses that results from prior experience with those or similar stimuli and responses.
    - Learning is not the same as fatigue or tiredness.
        - Fatigue: Decline due to muscle tiredness – regain when restored.
        - Maturation: Age related developmental changes – EG: How you walk will change as your legs grow.
    - Allows us to adapt to our environment.
- Study of Learning:
    - Scientific method.
    - Levels of analysis:
        - Behavioural: Interested in the whole organism.
        - Neural Mechanisms: Neural systems/networks.
        - Molecular, cellular and genetic.

    - Interested in causality.
- Elicited Behaviour: Behaviour which occurs in response to a stimulus.
    - Reflex: Two closely related events; eliciting stimulus and corresponding response.
        - Presentation of the stimulus is followed by the response and the response rarely occurs in the absence of the stimulus.
        - Forms of behaviour that are selected for.
            - Tend to be innate.
        - Can come under the influence of other events.
            - Suckling and milk let-down reflex.
            - Milk let don under control of crying or time.
    - Model Action Patterns:
        - Species-specific response sequence.
            - Evolve to solve problems commonly encountered throughout the species evolutionary history.
        - Supernormal stimulus: Larger, exaggerated response.
    - Behavioural Sequences:
        - Actions may be organised into functionally effective sequences.
            - Appetitive Behaviour: Early components of a behavioural sequence. They represent the desire or need for a particular consequence.
                - More flexible/variable across situation and individuals.
            - Consummatory Behaviour: The end components. They represent the consummation or completion of a response sequence.
                - Fixed, stereotyped.
                - Species-specific model action patterns.
- Habituation: Decrease in responsiveness due to repeated stimulation.
        - Specific stimulus: You only habituate to the specific stimulus.
        - Requires attention.
    - Obesity and habituation (Epstein et al., 1996, 2008): Evidence suggests that some people who are overweight or obese do not habituate to taste in the way people of healthy weight do.
    - The Startle Response:
        - Startling response is a part of an organism's defense reaction.
        - Leaton (1976) studied the effect of repeated presentation of an eliciting stimuli (loud tone) on the startle reflex.
            - Played brief, loud noise to the rats and measured startle response
                - Phase 1: noise played once at beginning of session for 11 days
                - Phase 2: noise played every 3 second for 30 trials per day
                - Phase 3: Noise played once at beginning of session for 3 days
            - Results: startle decreases in intensity with repeated exposure (but never fully goes away)
                - When tone played fewer times spaced apart, habituation is slow but lasting
                - When tone played many times in a row, habituation occurs quickly, but does not last
                - Startle response recovered after moving to phase three (Spontaneous recovery)
                - Persistence of response suggests it is important to the organism
- Sensory Adaption: Reduction in sensitivity of sensory organs/neurons due to repeated stimulation.
    - IE: Receptors are overwhelmed.
- Fatigue: Reduction in behaviour due to excessive use of muscles required to perform.
    - IE: Muscles are too tired to do it again.

- Sensitisation: An increase in response intensity when stimulus appears when organism is in state of autonomic arousal.
    - Eye blink reflex: People reflexively blink when air is blown into their eye.
        - Bradley, Moulder & Lang (2005)
            - Participants looked at a mix of pleasant and unpleasant images.
            - Induced arousal by threatening to shock them.
            - They didn't actually shock them, just made them think they would
            - Measured intensity of eye blink over repeated presentations of eliciting stimulus (air puff).
- Dual Process Theories of Habituation and Sensitisation:
    - Dual process theories argue that different neurological processes are responsible for each.
        - Habituation:
            - S-R System: Reflex arc.
            - Activated by presentation of eliciting stimulus.
        - Sensitisation:
            - State System: Regions or the nervous system responsible for general arousal levels.
            - Only activated under specific circumstances – when environmental stimuli lead to increased arousal. EG: Drugs, emotional experiences, etc.
    - Implications of Dual Process Theory:
        - The S-R system is involved in all elicited behaviour.
            - Habituation should always be expected.
            - Habituation should be stimulus specific.
        - State system is only involved under special circumstances.
            - Not stimulus specific.
        - Both habituation an sensitisation effects will fade over time.
- Opponent Process Theory of Motivation:
    - Presentation of an emotionally-arousing stimulus leads to a particular response (primary response)
        - EG: See your BF/GF = feel happy.
    - When the stimulus is removed, the opposite response often takes its place (opponent response)
        - EG: GF/BF leaves = feel sad.
    - Overtime the primary response habituates
        - EG: Feel less and less intensely happy each time you see them; passion becomes affection.
    - But the opponent response strengths
        - EG: After a long time together, loss of the other person leads to more intense feelings of sadness.
        - Think of an elderly couple – they don't get super excited when they see each other, but they feel intense grief when one of them passes away
    - This process is about maintaining emotional homeostasis.