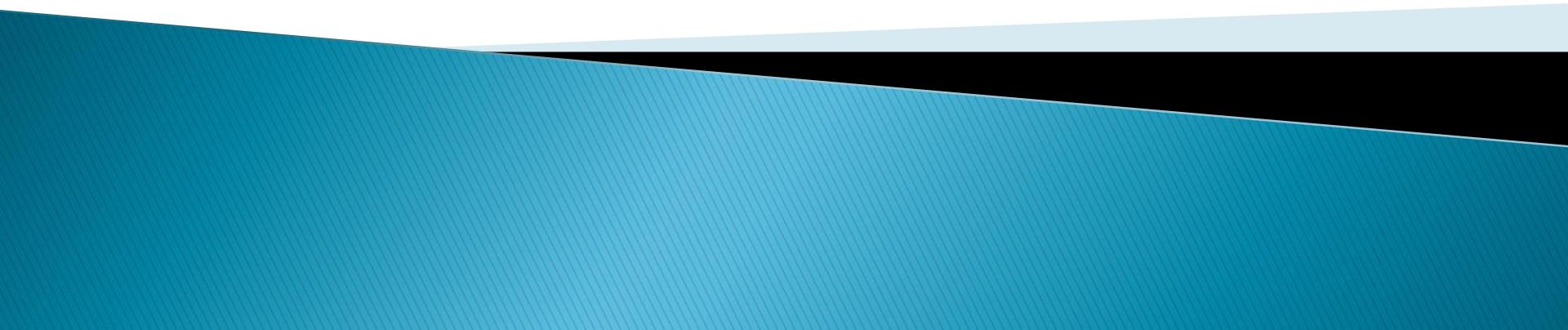


Experimental Psychology

M4X00905

Lecture 4: The Rise of Behaviourism.

Dr Kate Williams



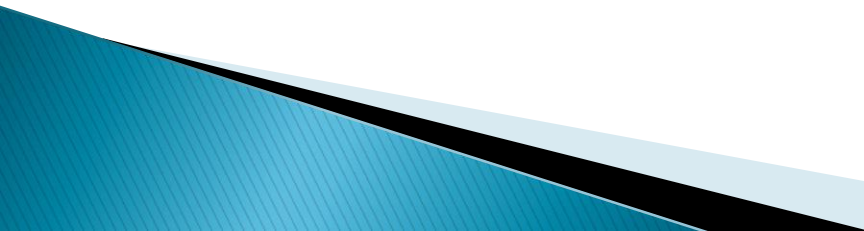
The Rise of Behaviourism

- ▶ Functionalism: mental states had to be understood in terms of the functions they performed, which enabled an organism to survive in their environment.
 - They rejected the idea of a pure realm of consciousness devoid from the practical demands of action.
 - Instead mental states could only be studied in connection to behaviour.
- ▶ These types of ideas were taken in a radical manner by the behaviourists.
 - Specifically: J. B. Watson and B.F. Skinner
 - For them, functionalism hadn't gone far enough
 - Mental states were actually nothing more than types of behaviour.

The Rise of Behaviourism

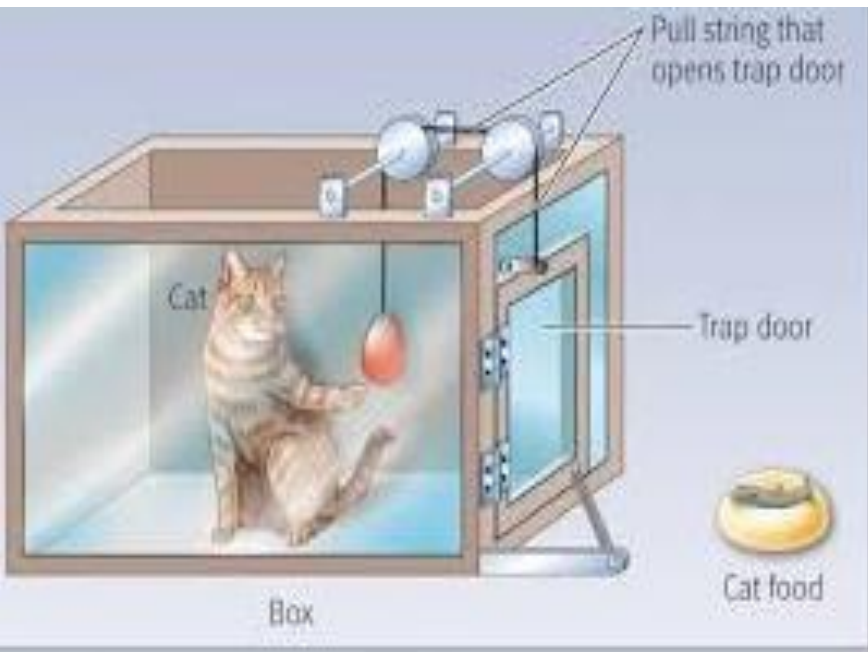
- ▶ An influential figure seen as one of the precursors of behaviourism was E. L. Thorndike.
 - He believed psychology should investigate observable behaviour.
 - He did not deny that mental states existed, but that their examination would be unproductive.
 - So, he argued against introspection.
 - It tells us nothing about the psychology of animals or children not yet capable of speaking.
 - Studying overt, objective behaviour would be of practical benefit to psychology as it would also enable the understanding of creatures incapable of introspection and communication.
 - Studying mental states through introspection is based on a misconception
 - There is a difference between experiencing a mental state and having knowledge of that mental state – e.g., toothache.

Thorndike

- ▶ He also believed that consciousness was connected with action and behaviour.
 - The legacy of functionalism can be seen in his ideas here:
 - The private, subjective realm of introspection does not allow the true study of mental states – they can only be studied in functional connection with their action.
 - We only know that states of consciousness exist because of their connection with actual behaviour.
 - For him, this action is any form of muscular movement.
 - ▶ In taking this new approach, the investigation of even animal behaviour could now be achieved.
 - Previously, researchers had gathered data on animals from anecdotal accounts of farmers, pet owners, etc., who believed their animals had specialist mental abilities.
 - For Thorndike, this revealed anthropomorphic ways of interpreting the accounts and was not an accurate way to measure behaviour.
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Thorndike

- ▶ Instead animal behaviour should be studied under rigorous scientific conditions in the controlled environment of a laboratory.
- ▶ His aim: to examine “associative processes” in animals in order to explain human behaviour.
 - So, he developed “**Puzzle boxes**”: e.g., a hungry animal would be placed inside a box from which it had to escape in order to get food.
 - Different types of boxes could be opened in different ways and at first the animal would try all different ways of opening it until accidentally finding the correct way.
 - On each subsequent trial, the animal would perform the correct response quicker.



- This type of learning comes from association of ideas: such as mental images of the box, motor representations, and memories.
- Thorndike believed this connection to be much more direct, with no mediation from mental states or ideas.
- For Thorndike, the animal perceives the current situation and enacts the appropriate behaviour.

Thorndike

- ▶ He saw this direct connection between situation and response by animals as similar to that created by a trained tennis player.
 - Seeing the tennis ball approach, hit it back over the net without conscious thought
 - This is the main point of minimising any thought process and becoming an expert
 - The association lies in the creation of a physical connection in the nervous system between the senses and the motor response without thinking or deliberation.
 - Learning as “connectionist” – the connections between neurons are either strengthened or weakened depending on whether the behaviour has a rewarding outcome.
- ▶ He calls these: the ‘Law of effect’ and the ‘Law of exercise’.



- The pattern of results from his animal experiments showed the gradual development of neural connections, not insightful thinking.
- If animals used rational problem-solving then they would escape much quicker.
- For Thorndike, human learning happened in much the same way and so his ideas were seen as an important beginning to the development of behaviourism.

- ▶ In 1913, Watson announced his behaviourist programme in a paper called “Psychology as the behaviourist views it”.
 - It was basically a “Behaviourist Manifesto”
 - In it he argued that psychology should focus exclusively on behaviour, because introspection could never give us any reliable facts.
 - It was trivial, had no relevance to everyday life, and was unable to answer the question as to the nature and number of basic elements that make up the mental state.
 - It has nothing to tell us on practical matters, such as which teaching method is best. The only way to find this out would be to run an experimental investigation to assess which had the better outcome – this would be practical as it could help improve learning.
 - Psychologists should ‘never use the term consciousness, mental states, mind, content, introspectively verifiable, imagery and the like’ (p.166).
 - He did not believe consciousness existed – so, how could introspection claim to investigate it?
- ▶ Floy (1908) – The Animal Mind
 - Nonhuman animals have conscious thought
 - Scathing attack by Watson
 - How do we know?

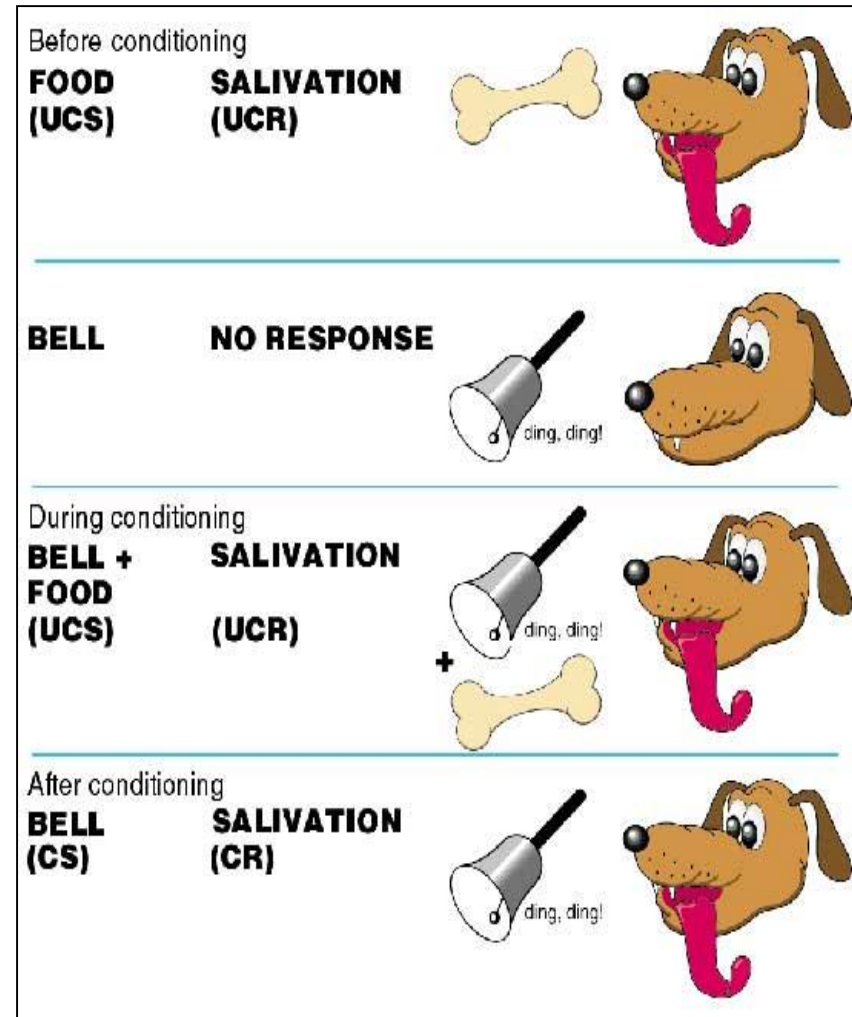
- ▶ Behaviourism – advocating that psychologists should restrict themselves to the scientific study of objectively observable behaviour
- ▶ What people do, rather than what they experience (Watson, 1913)
 - Stop the debates that had crippled philosophy
 - ‘The purpose of psychology is no longer the description and analysis of consciousness, but the prediction and control of behavior’ (1913, p.158).
 - He believed that all behaviour could be understood in terms of what’s known as a **Stimulus-response relationships (SR)**.
 - Stimulus: an object/event in the environment or internal organs that causes a response.
 - Response: bodily movement/action
 - The organism is not the initiator of the behaviour – it is the causal effect from the environment that elicits the response.
 - The effects produced by a cause must happen immediately and the relationship must be direct.
- ▶ Having an understanding of the relationship between cause and effect in predicting behaviour was just one aspect of Watson’s view.
 - He also wanted to control it!!!

- ▶ In order to do this, behaviour would need to be malleable. If behaviour was the result of innate or fixed instinct then this would not be possible.
 - For Watson there were a few basic drives – e.g., food, but he rejected the idea that more complex aspects were innate.
 - ‘there is no such thing as inheritance of capacity, talent, temperament, mental constitution, and characteristics (1913, pp.74 – 5)
 - This echoes the empiricist views of Locke in that a child's mind is a blank slate at birth and through education a person is moulded – Tabula rasa.
 - He believed this moulding could be achieved through S–R learning.
- ▶ Watson – ‘[i]f you decide that the human organism should behave in this way, you just arrange situations of such and such kinds’ (1913, p.7).
- ▶ The S–R learning that he thought could mould behaviour was based on the principles of conditioned reflexes as investigated by Ivan Pavlov (1849–1936).

Pavlovian (Classical) conditioning (1904/1923)

Pavlov differentiated between:

- **Unconditioned reflexes:** simple, direct, and natural responses to specific stimuli
 - **Conditioned reflexes:** not an inbuilt part of the organism, but was a learned response.
- ▶ A stimulus evoking a response through being paired with a stimulus that naturally evokes a response:
- ▶ US = unconditioned stimulus (e.g., food)
 - ▶ UR = unconditioned response (e.g., salivation)
 - ▶ CS = conditioned stimulus (e.g., bell)
 - ▶ CR = conditioned response (e.g., salivation)
 - When UR = CR we have classical conditioning



Watson & Rayner (1920) – Little Albert

- ▶ So, Watson attempted to use Pavlovian principles to condition fear in to a 9 month-old infant called ‘Little Albert’
- ▶ Albert had been happy to play with a white rat, but after Watson made a loud banging noise with a hammer and metal bar every time Albert touched the rat, he started to cry and then showed fear towards the rat whenever it came close.
- ▶ Watson argues that this shows behaviour being directly influenced by the environment: Induced fear conditioning (CR) of a CS (white fluffy things) by pairing with US (loud frightening noise).
- Major ethical issues?



Behaviourism and thinking

- ▶ Although movement of the body was the most common response to stimuli, Watson recognised that there are also implicit responses that cannot be observed without specialist instruments.
- ▶ They are still behavioural and physical, and can in principle be observed, because they do not differ intrinsically from explicit responses.
 - E.g., someone who was hungry standing outside a bakery – the implicit response could be their salivary glands secreting.
 - However, wouldn't it be the case that the person also has thoughts – e.g., “That pasty looks tasty”.
 - Watson's analysis of behaviour ignores the actual process of thinking – instead he calls this ‘just talking to ourselves’.
 - And this talking to ourselves is simply achieved through the learning of language (which occurs in the same way as the learning of motor responses).

Behaviourism and thinking

- ▶ Infants naturally produce vocal reflexes, some of which will conveniently sound similar to words – so adults attempt to get children to associate the vocalisation with the objects named by the word and then shape the response to get it closer to the actual word.
- ▶ These learned responses are more complex than simply moving the hand, because they involve the coordination of multiple processing.
- ▶ According to Watson: these “muscular habits learned in overt speech are responsible for implicit or internal speech” (p.192).
- ▶ Even the actions we perform with our body while we speak become a part of these complex motor habits.
 - So, for Watson even thinking sub-vocally involves physical movements/muscular activation.
 - These may be invisible to an observer but they are nevertheless still seen as physical, in the same way as larger movements that can be observed.
 - So, we don't need to think of it as taking place in an inner subjective world.

Skinner's Operant Conditioning

- ▶ Like Watson, Skinner did not believe in the existence of mental states in the traditional sense.
- ▶ He was also a “radical behaviourist” and agreed with Watson that the goal of behaviourism was to predict and control behaviour.
- ▶ However, Skinners views differed to the those of Watson:
 - Skinner viewed the organism as active, as purposefully producing behaviour, rather than being a passive recipient of stimuli from the environment.
 - Organisms actively explore and operate on their environment.
 - This is why he used the term ‘**Operant**’ rather than reflex.
- ▶ But where does this ‘purpose’ come from?
 - A traditional ‘mentalist’ answer would suggest that purpose comes from an inner act of free will on the part of the organism.
 - But Skinner rejected the idea that any behaviour was the outcome of a mental event.

Skinner's Operant Conditioning

- ▶ But he also rejected the idea that behaviour is caused in a mechanical manner through the traditional S-R view.
 - ▶ Instead his views were more in line with those of Darwin.
 - Skinner used Darwin's realisation that, causal forces that shape evolution were not in the current environment but in the past.
 - Through Darwin's theory of evolution, organisms produce variations, some which are more successful than others.
 - The successful variations are selected by the environment and continue to exist – those that are not successful do not continue.
 - ▶ So, Skinner applied similar reasoning to explain behaviour.
 - Behavioural variations (just like biological ones) are also selected by the environment – successful ones allow the organism to survive.
 - ▶ These behaviours are said to be “**Reinforced**”
 - ▶ The positive consequences that strengthen successful behaviour are called “**Reinforcers**”.
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Skinner's Operant Conditioning

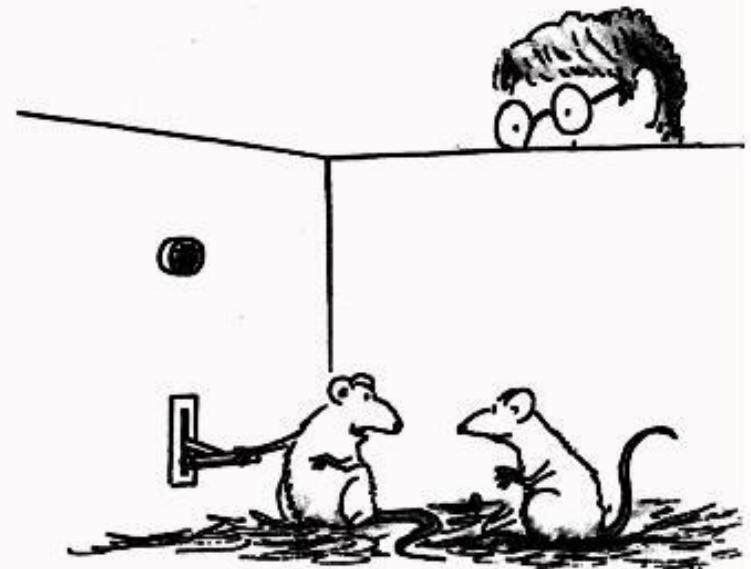
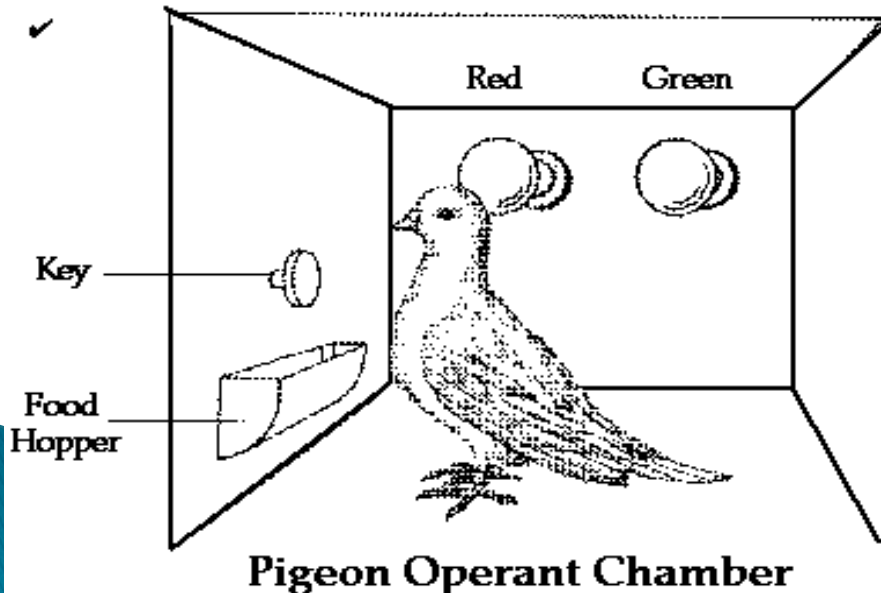
- ▶ Past consequences of a behavioural variation is what determines the probability that the behaviour will be seen again in the future.
- ▶ There is *historical* rather than *mechanical* causality to explain behaviour.
- ▶ His reconceptualization of mentalistic concepts ran counter to the traditional views in Western psychology and philosophy.
 - If we want to look at things like perception, learning, and memory we have to look outside the person – to the history of how the person interacts with the environment. For example, when remembering something, it is not about having a thought in your mind, but to act in a way that has been informed by previous experience.
 - Similarly, having knowledge is being able to *do* something – asking for directions, ordering a meal, discuss the latest political events, and so forth.
 - Basically, it is a matter of being able to *behave* in a certain way.
 - This is far more practical than just having ‘ideas’ in our head.
 - Behaviour is not just the outward sign of knowledge – it *is* the knowledge.
- ▶ The same applies to perception – it allows us to act a certain way
 - ▶ Perceptual Behaviour

- ▶ Classical conditioning of Pavlov/Watson ignored one key aspect: Animals are not passive in their environment
- ▶ Skinner's key question
 - How do animals learn to act?
- ▶ Operant conditioning chamber ('Skinner box')
 - Environment with a lever that supplies food



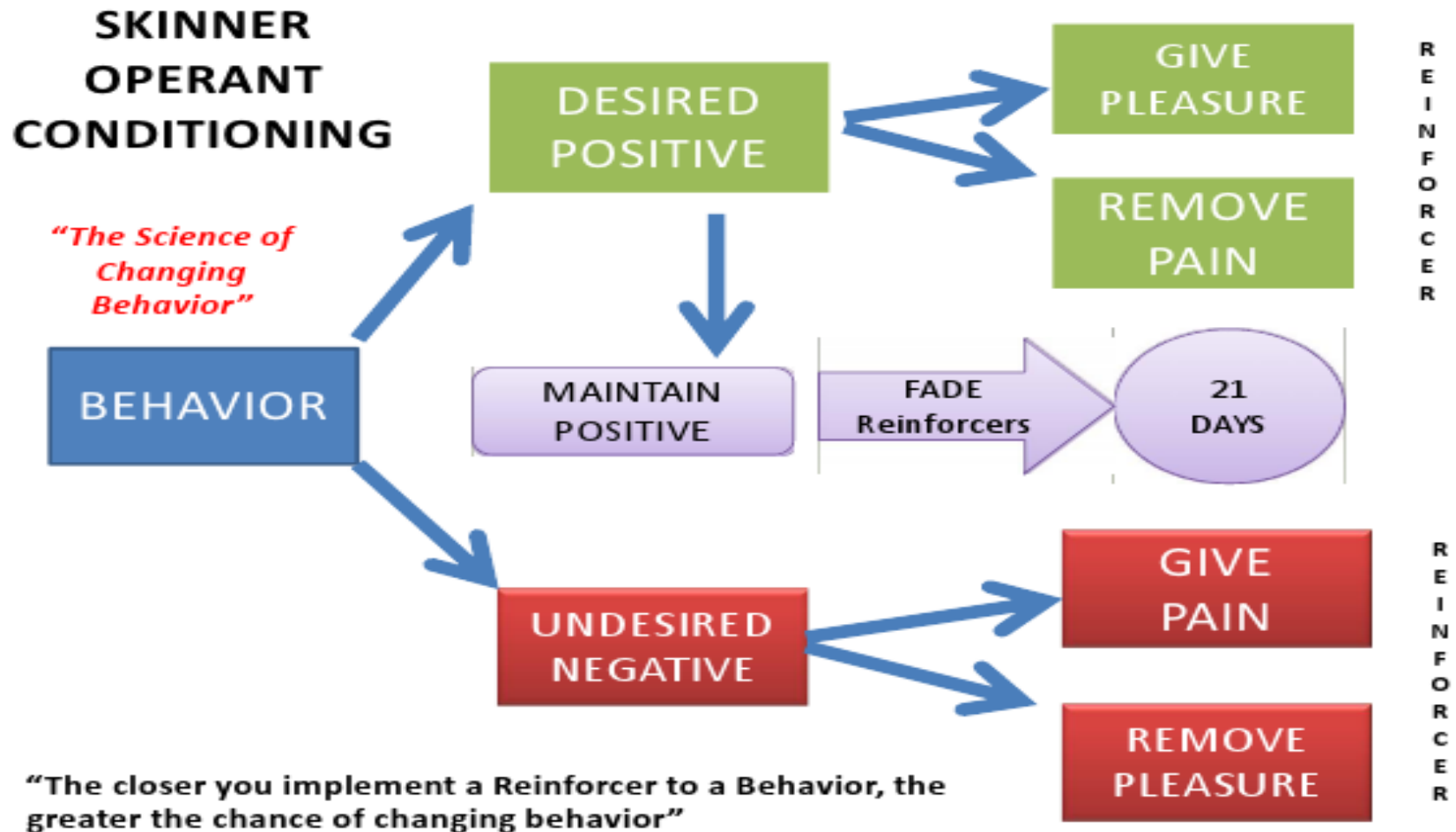
▶ Rat/Pigeon in a box

- Explores and hits lever by accident – supplied with food
- Learning takes place – rate of bar press increases
 - Reinforcement



It's a rather interesting phenomenon. Every time I press this lever, that post-graduate student breathes a sigh of relief.

- ▶ Consequences of a behaviour determine whether it will be more or less likely to occur
 - Positive and negative reward
 - Positive and negative punishment



The Simple Guide to Operant Conditioning

- ▶ <https://www.youtube.com/watch?v=teLoNYvOf90>

▶ Pigeon table tennis

- Break down complex behaviours into small components
 - Reinforce correct moves
 - Do not reinforce incorrect moves

▶ ‘Free will as an illusion’ (Skinner, 1938)

- <https://www.youtube.com/watch?v=vGazyH6fQQ4>

Skinner

- ▶ His views on causality and the reinterpretation of ‘mental’ processes was much more subtle than those of Watson.
 - He believes that covert verbal behaviour is often associated with thought, but does not identify the two in the same way as Watson.
- ▶ For Watson: verbal behaviour was defined as a particular bodily – muscular habit, learned in the course of being conditioned by experience.
 - Thinking was intrinsically attached to speech, which was attached to the whole vocal apparatus.
- ▶ For Skinner: verbal behaviour had nothing to do with anatomical structures.
 - Instead it was defined by the type of reinforcement history by which it was shaped.

Skinner

- ▶ So, he differentiated between verbal behaviour itself and the physiological structures that enables it.
- ▶ The issue with Watson's idea of verbal behaviour was that it was too simple and associated with movement in the vocal tract.
 - However, verbal behaviour constitutes other non-vocal aspects.
 - Can you think of any examples?
 - Writing, sign language – both are forms of verbal communication but do not involve sound and subsequently do not involve muscle movements involved in speech.
 - Also, we can make sounds with our vocal tract that wouldn't be constituted as meaningful verbal behaviour.
- ▶ What makes verbal behaviour, *verbal* for Skinner is nothing to do with the behaviour on its own, its in the reinforcement history.
- ▶ Thinking often takes the form of covert verbal behaviour – but other covert non-verbal behaviour also constitutes thinking for Skinner.
 - Verbal behaviour just lends itself to covert performance more than other behaviour.

Skinner

- ▶ He did not believe there was anything special about covert behaviour compared to overt behaviour, that turns it into thinking.
- ▶ Instead there is a continuum of the degree to which behaviours may be carried out covertly.
- ▶ A behavioural account of thinking then would be interpreted as covert performance that can also be overt.
- ▶ However, some mental processes such as abstraction and generalisation, which are usually considered as ‘thinking’ are in fact according to Skinner not easily assimilated to covert behaviour.
- ▶ Skinner believes “these are not covert or overt behaviours – instead they are the controlling relations or changes in probability which result from changes in such relations” (*Verbal Behaviour*, p. 438).
- ▶ For him there is no such thing as an independent behaviour or process called ‘thinking’ – it is a term we use to qualify behaviours.
 - The study of thought is nothing more than the study of behaviour.

Next week....

- ▶ Reading Week (no lectures/seminars)
 - ▶ Following Week (w/c 6th Nov):
 - ▶ Lecture: Behaviourism II
 - ▶ NO Seminar: Personal tutor meetings
 - ▶ ESSENTIAL READING:
 - Pearce, J.M. (1997). Animal learning and cognition. Chapter 2 – Provided on Moodle.
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