

## Relative Influence

- Hull
  - Much more influential
  - Constructed postulates and derived theorems
  - Built discipleship at Yale's IHR
  - In line with naturalistic-positivistic zeitgeist of American psychology after WWI
- Tolman
  - Cryptophenomenologist
  - Never a systematic theorist
  - No disciples
  - Mysticism about purpose and cognition

## We're All Behaviorists Now

- Kenneth Spence (1907-1967)
  - Collaborated on Hull's work, continued his theorizing
  - Observed that behaviorism took many forms (1948)
  - Tried to create common beliefs that all behaviorists could agree on

## We're All Behaviorists Now

- Skinner
  - Influenced by Watson
  - Work out behaviorism with new set of technical concepts (1931)
  - *Behavior of Organism* (1938)

## After the Golden Age

- Experimental psychology after WWII
  - The study of learning
- Sigmund Koch
  - psychology “entered an era of total disorientation”(1951)
  - Internal cause: stagnation
  - External cause: social usefulness

## After the Golden Age

- Karl Lashley (1951)
  - Attacked S-R chaining theory of complex behaviors (language)
  - Central planning functions which coordinate actions as units
- Frank Beach (1950)
  - Questioned the generalizability of lab findings
  - General science of behavior or learning in the Norway rat

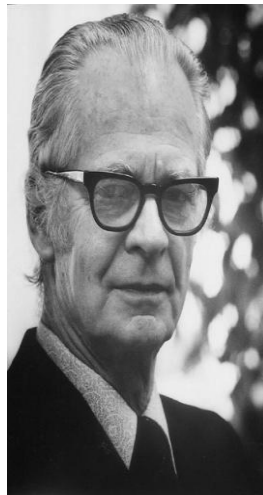
## Formal Behaviorism in Peril

- Generation of experimental psychologists after WWII
  - Professionally raised on logical positivism and operationism
  - Apply criteria to theories of Tolman and Hull
- Dartmouth Conference on Learning Theory (1950)
  - Hull's theory was most strongly criticized
  - Followed by Tolman and Skinner

## Radical Behaviourism – B.F. Skinner (1904 – 1990)

- Best known and most influential behaviourist
- Rejected previous tradition that tried to explain internal processes
- Based on Darwinian evolutionary theory
  - Followed Watson: environment responsible for behaviour
  - Looked *outside* humans for causes of behaviour
  - People should not be praised or blamed for anything they do
    - Good/evil, if they exist, lie in environment, not the person

### B.F. Skinner



## **Radical Behaviourism – B.F. Skinner (1904 – 1990)**

Defined three aspects of radical behaviourism:

- 1 Philosophy
- 2 The Experimental Analysis of Behaviour
- 3 Interpretation of Human Behaviour

## **Radical Behaviourism as a Philosophy**

Critique of Freud's theory:

- Freud's great discovery: human behaviour has unconscious causes
- Great mistake: invention of a mental apparatus (id, ego, superego)
- Lesson: consciousness is irrelevant to behaviour

## Radical Behaviourism as a Philosophy

Critique of Freud's theory contin.

– Example:

- Student: neurotic subservience to teachers
- Father: punitive perfectionist
- Freud: child incorporated stern father image into superego
- Skinner: direct link between punishment by father and student's current behaviour

## Radical Behaviourism as a Philosophy

Current **behaviour** based on **consequences** of past behaviour

- Addition of a mental link only complicates matters; requires explanation itself
- Considered all mental entities unnecessary:
  - Superego
  - Apperception
  - Habit strength
  - Cognitive maps

## Radical Behaviourism as a Philosophy

### Empiricist

- Influenced by radical empiricism of Francis Bacon and Ernst Mach
  - Truth found in *observations* themselves; not in our interpretations
  - e.g. “*reflex*” just a convenient term that describes a regular correlation between stimulus and response; not an entity inside an animal

## The Experimental Analysis of Behaviour

Inspired by the success of Pavlov’s work with conditioned reflexes

- Goal of psychology:
  - To analyse behaviour by identifying specific determinants of behaviour and to
  - Establish the exact nature of the relationship between antecedent and behaviour
- Best way to do this: experiment - allows for systematic control of all factors affecting

## The Contingencies of Reinforcement

A behaviour is explained when all the influences of that behaviour have been identified and can be controlled

- Antecedent influences are called *independent variables*
- Behaviour that is a function of these antecedents are called *dependent variables*
- The organism is then thought of as a *locus of variables*: a place where independent variables act together to produce a behaviour
- There are no intervening mental processes between independent and dependent variables

## The Contingencies of Reinforcement

Skinner assumed that physiology would eventually be able to outline the physical mechanisms that control behaviour

- However this is completely separate from analysis of behaviour in terms of functional relationships among variables
- The functions would still be relevant, even after the mechanisms are understood



## The Contingencies of Reinforcement

Like Watson, Skinner wanted not only to describe and predict behaviour, he also wanted to control it

- Control was the ultimate test
- Prediction alone not enough
  - Correlation between two variables may actually be the result of a third variable
  - E.g. high correlation between children's toe size and weight but toe size does not cause weight, they are both the result of growth

## The Contingencies of Reinforcement

A behaviour is explained when it can be both predicted *and* influenced by the manipulation of independent variables

- Two kinds of learned behaviour:
  - Respondent
  - Operant

## The Contingencies of Reinforcement

Respondent behaviour or learning (as studied by Pavlov)

- Called *reflex* behaviour
- E.g. salivation
- A *respondent* is a behaviour elicited by a definite stimulus (can be either conditioned or unconditioned)
- “Involuntary” behaviour

## The Contingencies of Reinforcement

Operant behaviour or learning

- Cannot be elicited but sometimes simply happens
- The probability of an operant reoccurring can be increased if it is followed by a *reinforcer*
  - After it is reinforced it is more likely to occur again in similar circumstances
- “Voluntary” behaviour

## **The Contingencies of Reinforcement**

Thorndikes's puzzle boxes were an operant learning situation

- Cat emits a variety of behaviours
- Pressing a lever results in escape
- This is reinforcing
- Placed back in box
- Probability of correct response now higher
- Operant response has been strengthened

## **The Contingencies of Reinforcement**

Contingencies of reinforcement are collectively defined by three things

- Setting (puzzle box)
- Reinforced response (lever pressing)
- Reinforcer (escape)
- The experimental analysis of behaviour: the systematic description of contingencies of reinforcement

## **The Contingencies of Reinforcement**

Analogy to Darwin's theory of Evolution:

- Experimental analysis of behaviour part of biology
- Explains behaviour as the product of its environment
- Process similar to natural selection that produces species

## **Radical Behaviourism as a Philosophy**

Analogy to Darwin contin.

Darwin: species constantly produce random various traits

- nature selects those that aid survival

Skinner: organisms constantly produce various behaviour

- some lead to favourable consequences, are reinforced, strengthened, and are learned
- others that do not lead to favourable consequences are not reinforced not

## The Contingencies of Reinforcement

- No room for mind
- All behaviour, learned and unlearned, a result of reinforcement history, or genes
- Never a product of intention or will

## The Contingencies of Reinforcement

Skinner differed from other behaviourists, including Watson, in 3 important ways:

- 1) Skinner not an S-R psychologist (#1)
  - Watson: applied classical conditioning to all behaviour
  - Skinner: operant responses are never elicited
    - e.g. rat trained to press lever in Skinner box
    - lever press only reinforced when light is on
    - light NOT a conditioned stimulus; does NOT elicit response
    - Light is a *discriminative stimulus*: enables animal to discriminate a reinforcing from a nonreinforcing situation

## The Contingencies of Reinforcement

### 2) Skinner not an S-R psychologist (#2)

- Animals can be affected by “controlling variables” – they do not need to be considered stimuli
  - E.g. motivation
  - Hull recognized drive-stimuli such as hunger
  - Food deprivation → unpleasant feeling of hunger → animal seeks to reduce these by seeking food
  - Skinner: no need for drive-stimuli
  - Food deprivation (measurable variable) → seeking food (observable behaviour)

## The Contingencies of Reinforcement

### 3) Definition of the operant

- Behaviour: movement in space, but not defined as simple movements
- Operant is a class of responses, not a single response

## The Contingencies of Reinforcement

E.g. cat in puzzle box may press the lever a number of different ways on different trials – with its paw, head, etc.

- Each is a different *response* (form is different)
- But all members of the same *operant* since it is controlled by the same contingencies of reinforcement
- On the other hand, two identical physical movements can be different operants if they are controlled by different contingencies
  - E.g. raising your hand to tell the truth in court vs. waving to your friend
  - The setting and contingency of reinforcement are different

## The Contingencies of Reinforcement

Especially important in explaining verbal behaviour

- E.g. “sock” has two meanings:
  - Something that goes on your foot
  - A punch
- The meaning of a word is a contingency of reinforcement

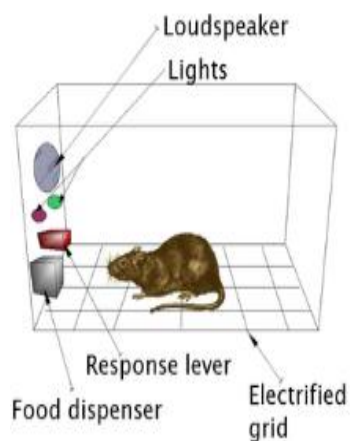
## Operant Methodology

Outlined an innovative and radical methodology

1) His experimental situation (operant conditioning chamber or Skinner box) allowed for fluid behaviour rather than separate arbitrary trials

- Behaviour may occur at any time
- Observed as it changes over time, not when it changes abruptly at the end of each trial

### Skinner Box





## Skinner Box



## Operant Methodology

- 2) Experimenter exerts maximum control over environment
  - Can manipulate or hold constant independent variables
  - Observe the effect on behaviour
  
- 3) Simple and artificial response
  - Rat presses lever
  - Pigeon pecks key
  - Responses unambiguous, easily observed, and counted

## Operant Methodology

Established *rate of responding* as basic data

- Easily quantified
- Measure of response probability
- Varies with changes in the independent variable

## Interpreting Human Behavior

- Skinner on language (1950s)
  - *Verbal Behavior* (1957)
  - Experimental analysis of behavior in animals are free of species restrictions, its methods can be extended to humans
  - Applicability of radical behaviorist analysis to language

## Interpreting Human Behavior

- Skinner on language (continued)
  - Language as behavior whose reinforcement is mediated by others
  - Tact: a verbal **operant response** under the **stimulus control** of the physical environment, and the correct use of which is **reinforced** by the verbal community

## Interpreting Human Behavior

- Radical analysis of tacting
  - Reduced reference or naming to a functional relationship among a **response**, its **discriminative stimuli**, and its **reinforcer**
  - Skinner's treatment of human consciousness: notion of private stimuli
  - Hull and Tolman were wrong to exclude private events from behaviorism

## Interpreting Human Behavior

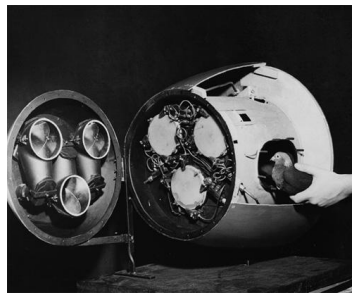
- Skinner's treatment of human consciousness
  - Internal stimuli can control behavior
  - Trained by the verbal community to observe our private stimuli
  - Self-reporting verbal behaviors are reinforced because they have survival value
  - Human consciousness is a product of the reinforcing practices of a verbal community

## Interpreting Human Behavior

- Skinner's treatment of human consciousness
  - human self-consciousness is not an innate possession of humans, but a social construction of human socialization
  - Explain purposive verbal behaviors without reference to intention or purpose
  - Thought is behavior under the control of the contingencies of reinforcement

## Interpreting Human Behavior

- The scientific construction of culture
  - Project OrCon (organic control)
  - Complete control of the pigeon's behavior
  - pecking operated missile



## Interpreting Human Behavior

- The scientific construction of culture
  - *Walden II* (1948)
  - Plausibility of through control of any organism's behavior
  - Skinnerian value: desire to scientifically control human lives in the interest of the survival of society (humans can be controlled to be happy and productive)

## Behaviorism and the Human Mind: Informal behaviorism

- Neo-hullian informal behaviorism (After WWII)
  - Cognitive processes received increasing attention
  - Humans possess “symbolic processes”

## Behaviorism and the Human Mind: Informal behaviorism

- Mediation theory
  - Building on Hull’s **fractional anticipatory goal response**
    - S-(r-s)-R
  - **Pure stimulus act**
    - Without acting on the environment, behaviors can occur internally to provide stimulus support for another behavior

## Informal behaviorism

- Cognitive processes admitted into behavior theory without inventing human mental processes
  - Mediation theory: Apply the conceptual machinery of single-stage S-R process
  - Behavior still explained by S-R behavior chains, with some of them taking place invisibly within the organism

## Informal behaviorism

- Incorporating human cognitive processes within the S-R framework
  - Neal Miller (1909-2002)
  - Social learning theory: applied mediation theory and loosened S-R theory to encompass human language, culture, and psychotherapy

## Informal behaviorism

- Mediation behaviorism – the major theoretical position in the 1950s
  - Gave up Watsonian & Hullian muscle-twitchism
  - Internalizing S-R language (in the brain)
  - Desire to preserve theoretical exactness & avoid “junkshop psychology”
  - link inferential behaviorism of 1930s & 1940s to the cognitive psychology of 1980s

## Philosophical Behaviorism



## Philosophical Behaviorism

- Came out of problems in animal psychology and in revolt against introspective mentalism
- Ordinary people believe they possess mental processes and consciousness, which goes against behaviorism
  - If the mind and consciousness do not exist then why is ordinary language full of words and descriptions related to these concepts?
- Philosophical behaviorism addressed the problem of reinterpreting common sense mentalistic psychology into acceptable “scientific” behavioristic terms

## Logical Behaviorism

- Another name for philosophical behaviorism
- A semantic theory about what mental terms mean
- Attributing a mental state to an organism is equal to saying that the organism is disposed to behave in a certain way
  - When we attribute a mental state to a person, we are not describing an inner mental state, but rather we are just describing their actual or likely behavior in a situation
- According to logical positivists, it would be possible to eliminate mental states completely from psychology and replace them with concepts referring to behavior

## Logical Behaviorism

- Logical behaviorism is implausible, because mental statements cannot always be directly translated into behavioral dispositions (e.g. thin ice)
- Difficulties relevant to experimental psychology because its doctrines are the application of operationalism to psychological terms
- Cannot always operationally define concepts
- Logical behaviorism is a false and inaccurate theory

## The “Ghost in the Machine”

- Descartes defined two worlds: the material world, including the body, and the mental and internal world
- Gilbert Ryle, an English philosopher, attacked Descartes for believing that the mind was distinct from the body
- Category mistake: because something has a name, it must apply to something separate from its parts (E.g. Oxford University)

## The “Ghost in the Machine”

- Cartesian dualism is a category mistake, since behaviors are described using mental predicates (intelligent, hopeful, sincere, etc.), we assume that there must be a mental thing behind the behaviors making them that way
- Behaviors themselves have these traits, and no “inner ghost” is needed
- Believing there is a “ghost” behind mental processes accomplishes nothing, we would then have to explain why it works the way it does (Ghost in the ghost in the ghost...)

## The “Ghost in the Machine”

- More to mental predicates than simply describing behavior
- They go beyond simple description, but not behind it, no inner ghost controlling it
- Ryle’s analysis of mind similar to behaviorism, but quite distinct from philosophical behaviorism and psychological behaviorism

## Mind as a Social Construct

- Philosopher Ludwig Wittgenstein argued that Cartesians led people to believe that there are mental objects (e.g. sensations) and mental processes (e.g. memory), but in fact there are neither

## Mental Objects

- Mental object (pain): Does not describe behavior or an inner object, and statements about pain are not descriptions of anything, they are expressions
- Problems with thinking of pain as an object:
  - Believing that 1<sup>st</sup> and 3<sup>rd</sup> person uses of the term are the same
  - Objects must be known and we must be able to say true things about them, but we must also be able to doubt the knowledge about them
  - How pains are located

## Mental Processes

- Mental process (remembering): There is no essential mental process of remembering, because there are many different ways you can come to the conclusion of remembering the same thing
  - We can perform many different behaviors to reach the same conclusion (e.g. remembering where we left our keys)
  - No common behavior or conscious experience, so there is no essential behavioral, mental or physiological process of remembering
  - We group events together because of their 'family resemblance', there is no single defining feature but all events share various similar traits, not processes but human abilities

## Mind as a Social Construct

- Psychology's conceptual confusion is to think there are mental objects and mental processes when there are not, and then to seek fictitious descriptions of the fictitious objects and processes
- Wittgenstein argued that explanations have to stop somewhere
  - Psychologists think concepts such as memory, wishing and thinking require explanations, but Ryle argues they do not, they are simply just things we can do without having some mental or physiological "inside story"

## Forms of Life

- Wittgenstein believed we cannot scientifically explain behavior, but we can understand it
- To understand behavior, we must take into consideration human “forms of life”, which are based on context and prior experience
- Someone who is not knowledgeable in an area (art) may see no meaning in something (a painting) because they do not participate in that form of life
  - As simply paint on canvas, a painting has no meaning, takes on meaning only in the eye of the interpretive viewer

## Forms of Life

- Human action is only meaningful within the setting of a form of life
- Psychology cannot be a science because there are no historically permanent and cross-culturally universal principles for understanding human thought and behavior
- Wittgenstein said psychology should accept the modest goal of explicating forms of life and explaining particular human actions within their historically given forms of life

## Conclusion

- Behaviorism predominated psychology until the 1960's
- It basically established psychology as a science, and defined it as the study of behavior
- This approach dominated for some time, but it eventually gave way to a less narrow and rigid approach that included internal processes