Neobehaviorism

Psychology 390
Psychology of Learning
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Hull

- Was the predominate psychologist in the 1940s and 50s.
- Theories set the standard for psychology for many years.
- Theories included:
  - Basic assumptions about psychology
  - Ways to conduct research.
  - Ultimate contributions were huge.

Hull

- Recruited some of the greatest future psychologists to his graduate program at Yale.
- Ken Spence
- Neal Miller
- O. H. Mowrer

History

- 1920s lots of things were happening.
- Watson’s views were having a great influence and behaviorism was beginning to develop.
- Others were joining in (Guthrie, Tolman).
- Structuralism was starting to die out.

Chaos Rules

- Lots of different models and approaches
  - Structuralism
  - Gestalt
  - Functionalism

Hull proposed a simple strategy to help organize the field of Psychology.

Hull’s Solution

- Organize what psychologists believe to be true in a clear manner.
- Once completed
  1. Derive testable statements from those assumptions.
  2. Carry out experiments to test the statements.
  3. If correct, great! If not, modify the assumptions.
Hull’s Solution

• Ultimately, the statements would become truths that members of the psychology community could use.

• Gradually the truths would improve.

• Work together under a shared set of assumptions and progress together, rather than in a disorganized fashion.

Major Components of Hull’s Theory

1. The Human must be Viewed in the Context that it is a Biological Machine.

• All explanations of behavior must be viewed in this context.
• We are dependent on activities of the body.
• When explaining mental activity, must do so in terms of biological actions.

Result.

• There was an exclusive emphasis on Stimulus - Response psychology

• Stimuli are things that produce reactions in the body.
• Responses are movements that occur due to stimuli. These can be glands, muscles, or today, firings of neurons.

Thus, all behavior can only be understood when translated in stimuli-response terms.

2. Quantification

• It is absolutely essential to quantify things.

• Hull was exceptional at this.
3. Clearly state basic assumptions in a way that allows you to test them.

- Extremely important concept.
- Provided Psychology with a way to develop methodology and arrive at the truth.
- Many organizational methods used in psychological research today have underpinnings from this concept.

Developed a series of postulates that could be tested.

1. Stimulus Trace

- Stimuli acting on us are effective for a time even after their removal.
- e.g., sensory memory
- Real stimulus was the nerve firing, not the physical properties of a light or sound stimulus.
- Lowercase s = nerve activity
- Uppercase S = properties of the physical stimulus

2. Afferent Interaction

- Stimulation is affected by other stimulation that is going on.

3. Reflexes are Present at Birth

- Reflexes are genetically programmed.
- The S-R connections are arranged such that if one response does not reduce the problem, another response will occur.
- Responses are arranged in a hierarchical form. e.g., sucking reflex
- This concept will become an important component of drive theory in motivation.

4. Primary Reinforcement

- We don't spend all of our lives reacting reflexively, we change behavior because new S-R connections are formed.
- New S-R connections were called Habits
- Follows the ideas of Thorndike.
- When a response is made in the presence of a stimulus and the response is followed by a decrease in the need for something, there will be an increase in the tendency of the stimulus to produce the response at a later time.
4. Primary Reinforcement

If someone is deprived of something for a period of time, the effect of the need reduction influences the response. e.g. Food deprivation increases responding and learning.

As with Thorndike

• Faster the presentation between the S and R, the greater the learning.
• More food you give, the greater the learning (except when at satiation).
• Be certain the consequence of the response reduces the need.
• Be certain the stimuli you want connected are present when you give the food.
• Do not delay the consequence after the R occurs.

Thus

• Gave greater accuracy to Thorndike’s “Law of Effect.”

• Might be a preliminary aspect of operant conditioning which concentrates on consequences.

Developed a Mathematical Model for Habit Strength

\[ \Delta sHR = F(M-sHR) \]

• Change in habit strength on a given trial is the product of a constant (F) which depends on stimulation,
  • and the maximum habit strength (M),
  • minus the current habit strength (sHR).

Like the Rescorla Wagner Model

• As a trial progress, the quantity \((M-sHR)\) decreases on each trial while habit strength increases.

Primary Drives

• We are basically biological machines at homeostasis (balance).
• Have a variety of sensory organs to keep us in balance.
• When we are deprived of something we develop a “Need.”
• The Need leads to a “Drive” to reduce the need and return us to homeostatic balance.
• The drive is the motivating force.
Examples of Primary Needs

- Air, Not Oxygen
- Water
- Food
- Urination
- Avoidance of noxious events

Secondary Needs

- Also called Psychogenic Needs
- Come from associations with primary needs.
- May be developed through Higher Order Conditioning.

Milk Example

- Infant needs milk which comes from mom.
- Develops an association of milk with mom (makes infant need mom).
- Mom gives attention when attending to infant.
- Result, attention becomes something that is needed (contact comfort).

Other Postulates

- 5. Stimulus Generalization
- 6. Drive Stimulus
- 7. Reaction Formation
- 8. Reactive inhibition
- 9. Conditioned Inhibition
- 10. Behavioral Oscillation

Goal of Postulates

- Hull wanted to begin somewhere
  - We must start with simple biological truths and build from there.
  - Begin with the simple and progress to the complex, NOT VICE VERSA.
  - Wanted to end the infighting.

Criticisms of the Model
Use of Intervening Variables

Watson
- Avoided the use of intervening variables.
- Explain the effects of independent variables specifically.

Tolman and Hull
- Used intervening variables to explain behavior (e.g., thirst)
- Drive, Habit Strength, etc.

Emphasis on a Molecular Model

- Explanations had to be cast in ultimate causes of behavior.
- Thus you needed to use a molecular view of the workings of the body.
- Have separate muscle movements and secretions of glands:
- Add them up and you have behavior.

Problem with the Hypothetico-Deductive Method

- There was a major difficulty in clearly testing theorems.
- There are few crucial experiments that are very clear, unambiguous, or show that something is true or false.

Denial of Subjective Experience

- While Watson and Guthrie stressed the importance of actions and behavior, they did not deny the existence of subjective experience nor claim it was outside the role of psychology.
- Believed subjective experience should be treated like any other behavior.
- We think and imagine. We do not think thoughts and imagine images.

Hull
- Argued the against even the study of subjective experience.
- PSYCHOLOGY MUST BE OBJECTIVE
  Don’t worry about private experience.
- Problem for the critics:
  Concern with private experience is very difficult to study OBJECTIVELY.