



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.

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Hull

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

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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.

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Chaos Rules

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

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

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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.

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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.

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Major Components of Hull's Theory

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Assumed Three Things

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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.

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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.

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2. Quantification

- It is absolutely essential to quantify things.
- Hull was exceptional at this.

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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.

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Developed a series of postulates that could be tested.

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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

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2. Afferent Interaction

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

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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.

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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.

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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.

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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.

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Thus

- Gave greater accuracy to Thorndike's "Law of Effect."
- Might be a preliminary aspect of operant conditioning which concentrates on consequences.

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Developed a Mathematical Model for Habit Strength

- $\Delta_s H_R = F(M - sH_R)$
- 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).

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Like the Rescorla Wagner Model

- As a trial progress, the quantity $(M - sH_R)$ decreases on each trial while habit strength increases.

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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.

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Examples of Primary Needs

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

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Secondary Needs

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

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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).

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Other Postulates

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

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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.

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Criticisms of the Model

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Use of Intervening Variables

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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.

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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.

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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.

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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.

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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.

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