Learning

Introduction to Psychology

Ram Manohar Singh

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Learning

❖ **Learning:**

➢ Any relatively permanent change in behaviour (or behaviour potential) resulting from experience.

Edward Lee Thorndike (1874-1949)

❖ Learning takes place
  ➢ by trial and error
  ➢ Learning by selection of the successful variant

❖ Thorndike's Puzzle Box

❖ Thorndike's conclusions about (trial and error) learning
  ➢ Learning is incremental.
    ▪ That is, it occurs a little bit at a time rather than all at once.
    ▪ With each successful escape, subsequent escapes were made more quickly.
  ➢ Learning occurs automatically.
    ▪ It is not mediated by thinking.
  ➢ The same principles of learning apply to all

Edward Lee Thorndike (1874-1949)

❖ Law or Readiness
  ➢ Learning takes place when an action tendency' is aroused through preparatory adjustment, set or attitude
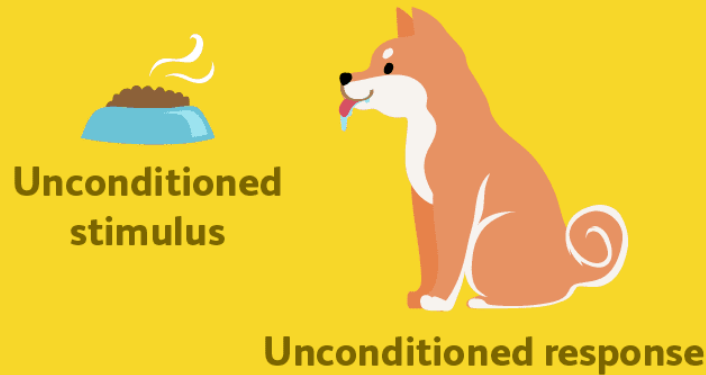
❖ Law of Effect
  ➢ Satisfying states lead to consolidation and strengthening of the connection, whereas dis-satisfaction, annoyance or pain leads to the weakening or stamping out of the connections.

❖ Law of Exercise
  ➢ Law of use
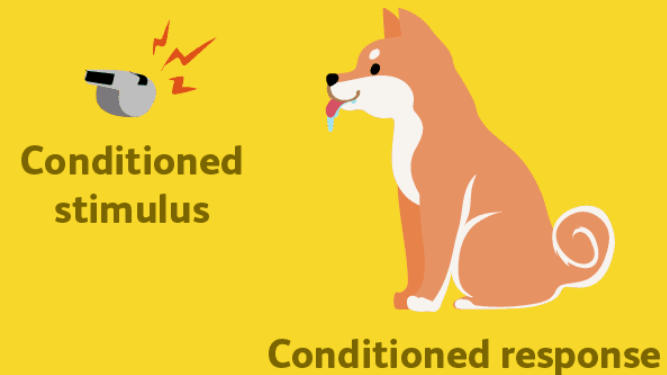 ➢ Law of disuse
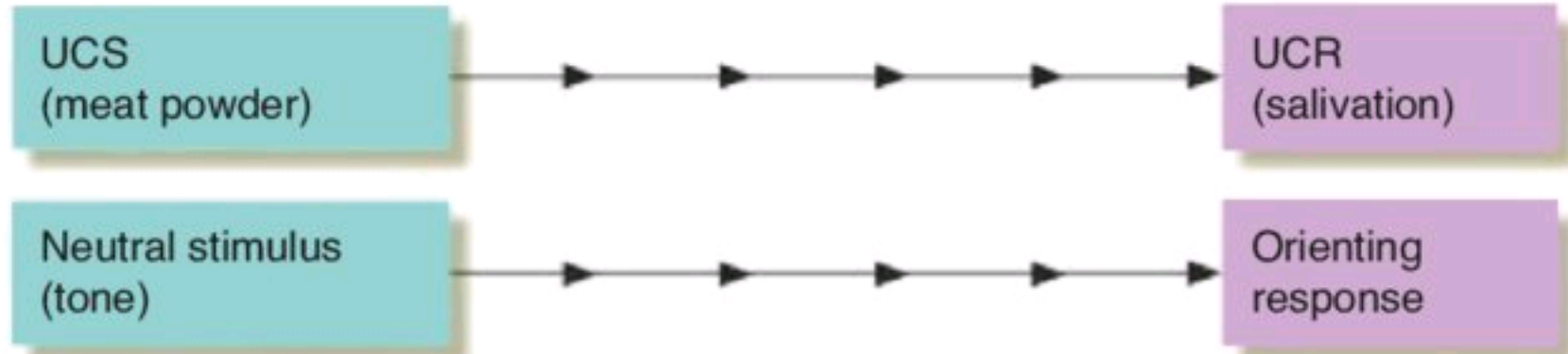
Classical conditioning

Classical conditioning

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PHASE 1 : Before conditioning has occurred

| UCS (meat powder) | → | UCR (salivation) |

| Neutral stimulus (tone) | → | Orienting response |

PHASE 2 : The process of conditioning

| Neutral stimulus (tone) followed by UCS (meat powder) | → | UCR (salivation) |

PHASE 3 : After conditioning has occurred

| CS (tone) | → | CR (salivation) |

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❖ **Unconditioned Stimulus (UCS)**
  ➢ In classical conditioning, a stimulus that can evoke an unconditioned response the first time it is presented.

❖ **Unconditioned Response (UCR)**
  ➢ In classical conditioning, the response evoked by an unconditioned stimulus.

❖ **Conditioned Stimulus (CS)**
  ➢ In classical conditioning, the stimulus that is repeatedly paired with an unconditioned stimulus.

❖ **Conditioned Response (CR)**
  ➢ In classical conditioning, the response to the conditioned stimulus.

Stages of conditioning

❖ **Acquisition:**
  ➢ The process by which a conditioned stimulus acquires the ability to elicit a conditioned response through repeated pairings of an unconditioned stimulus with the conditioned stimulus.

❖ **Extinction:**
  ➢ The process through which a conditioned stimulus gradually loses the ability to evoke conditioned responses when it is no longer followed by the unconditioned stimulus.

❖ **Spontaneous Recovery:**
  ➢ Following extinction, return of a conditioned response upon rein- statement of CS–UCS pairings.
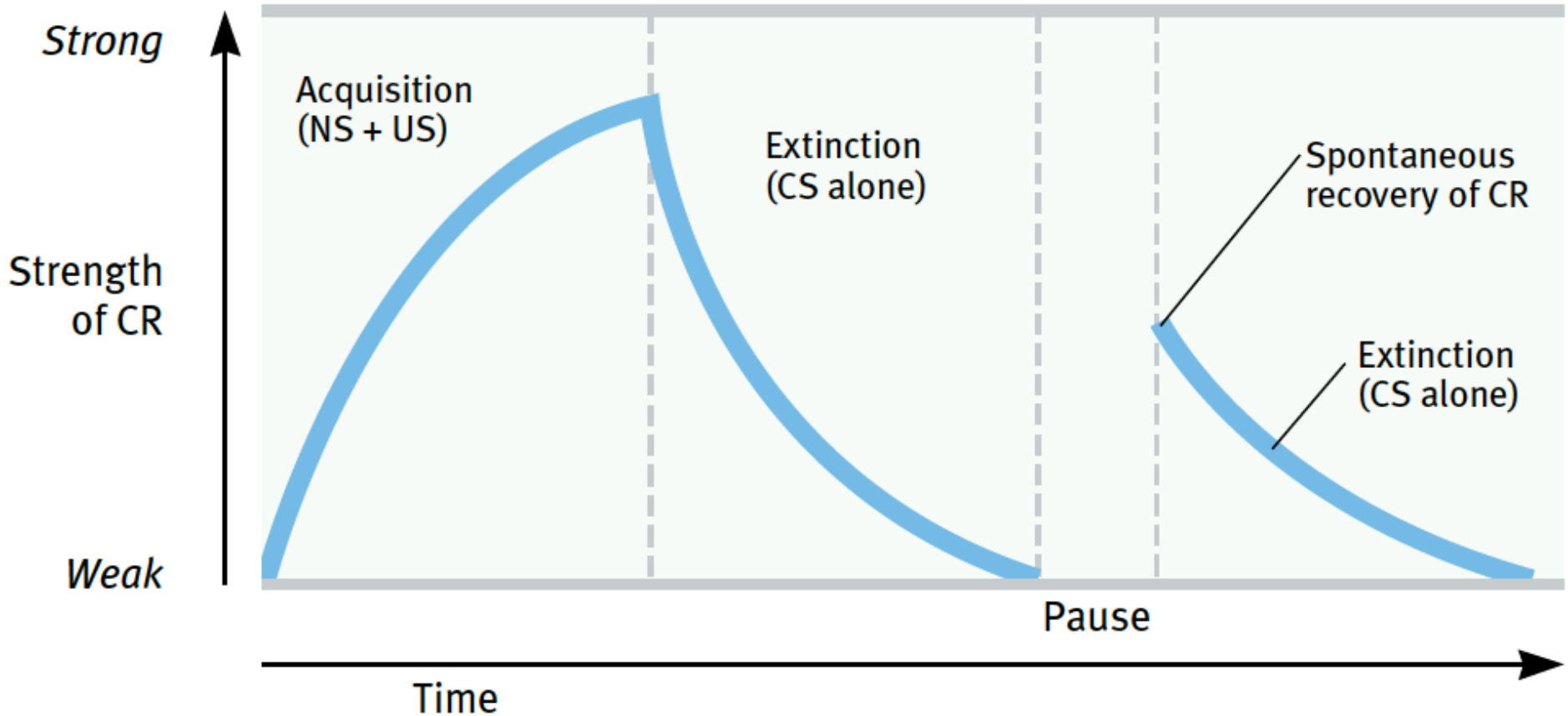
❖ **Reconditioning:**
  ➢ The rapid recovery of a conditioned response to a CS–UCS pairing following extinction.

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Generalization and Discrimination

❖ **Stimulus Generalization:**

➢ The tendency of stimuli similar to a conditioned stimulus to evoke conditioned responses.

❖ **Stimulus Discrimination:**

➢ The process by which organisms learn to respond to certain stimuli but not to others.

Operant Conditioning

❖ A process through which organisms learn to repeat behaviors that yield *positive outcomes* or permit them to avoid or escape from *negative outcomes* .

❖ **Reinforcement**

➢ The application or removal of a stimulus to increase the strength of a specific behavior .

➢ **Positive Reinforcers:**
- Stimuli that strengthen responses that precede them .
- *Primary reinforcers are innate and natural*
  - include food when we are hungry, water when we are thirsty
- *conditioned reinforcers* acquire their capacity to act as positive reinforcers through association with primary reinforcers
  - money, status, grades, trophies, and praise from others

Operant conditioning

❖ **Negative Reinforcers:**

  ➢ Stimuli that strengthen responses that permit an organism to avoid or escape from their presence.

❖ **Punishment:**

  ➢ The application or removal of a stimulus so as to decrease the strength of a behavior.

  ➢ an unpleasant outcome follows the (undesired) behaviour

  ➢ **Positive punishment**

    ▪ behaviours are followed by aversive stimulus events (*punishers).*

  ➢ **Negative punishment**

    ▪ the rate of a behaviour is weakened or decreased by

Operant conditioning

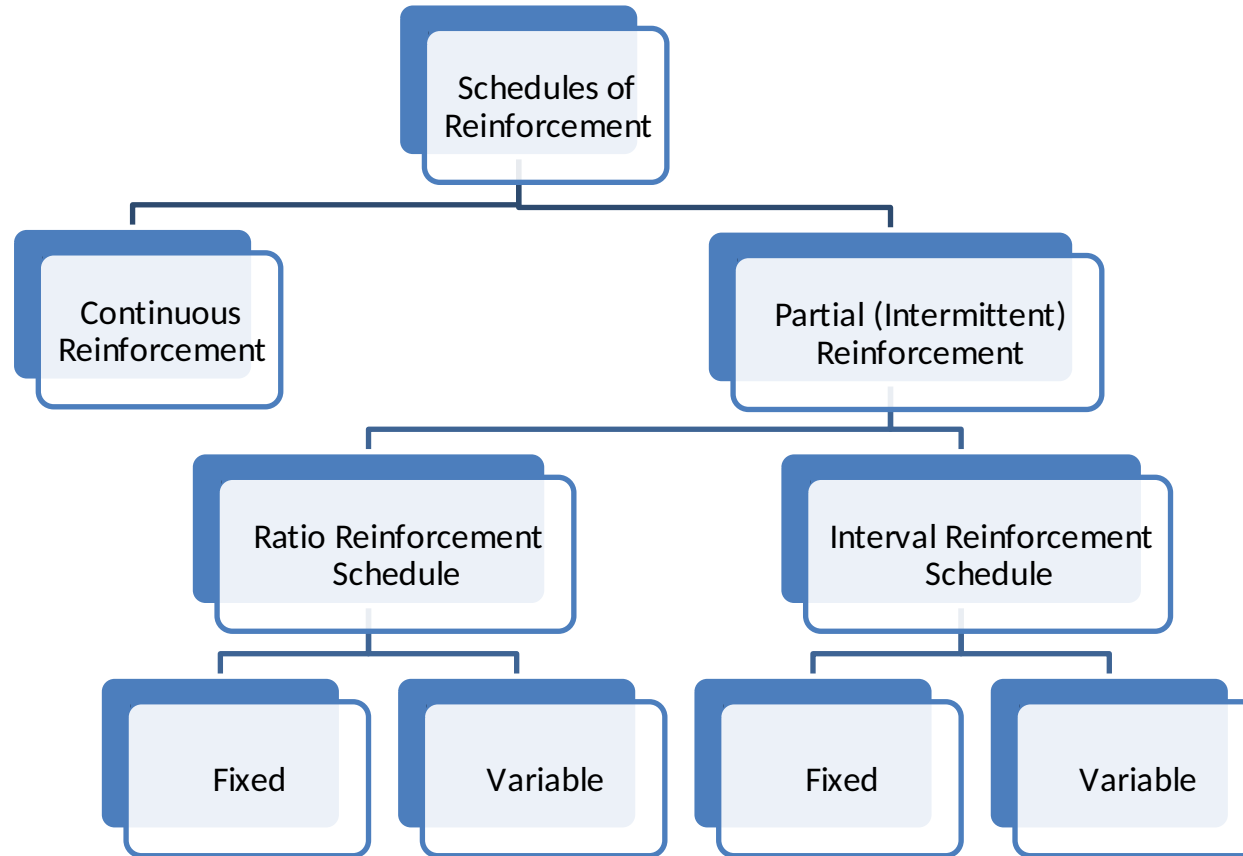| Procedure	Stimulus Event	Effects	Behavioral Outcomes
Positive reinforcement	Application of a desirable stimulus (e.g., food, sexual pleasure, praise)	Strengthens responses that precede occurrence of stimulus	Organisms learn to perform responses that produce positive reinforcers
Negative reinforcement	Removal or postponement of an undesirable (aversive) stimulus (e.g., heat, cold, harsh criticism)	Strengthens responses that permit escape from or avoidance of stimulus	Organisms learn to perform responses that permit them to avoid or escape from negative reinforcers
Positive punishment	Application of an undesirable (aversive) stimulus	Weakens responses that precede occurrence of stimulus	Organisms learn to suppress responses that lead to unpleasant consequences
Negative punishment	Loss or postponement of a desirable stimulus	Weakens responses that lead to loss or postponement of reinforcement	Organisms learn to suppress responses that lead to loss or postponement of reinforcement

Shaping and Chaining

❖ Shaping

➢ A technique in which closer and closer approximations of desired behavior are required for the delivery of positive reinforcement.

❖ Chaining

➢ A procedure that establishes a sequence of responses, which lead to a reward following the final response in the chain.
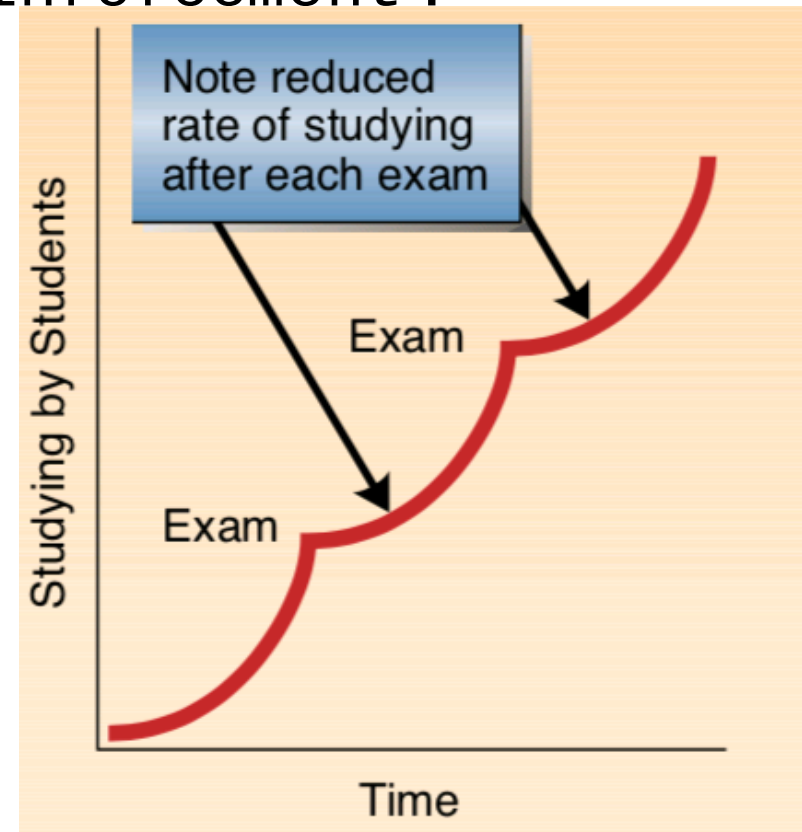
Schedules of Reinforcement

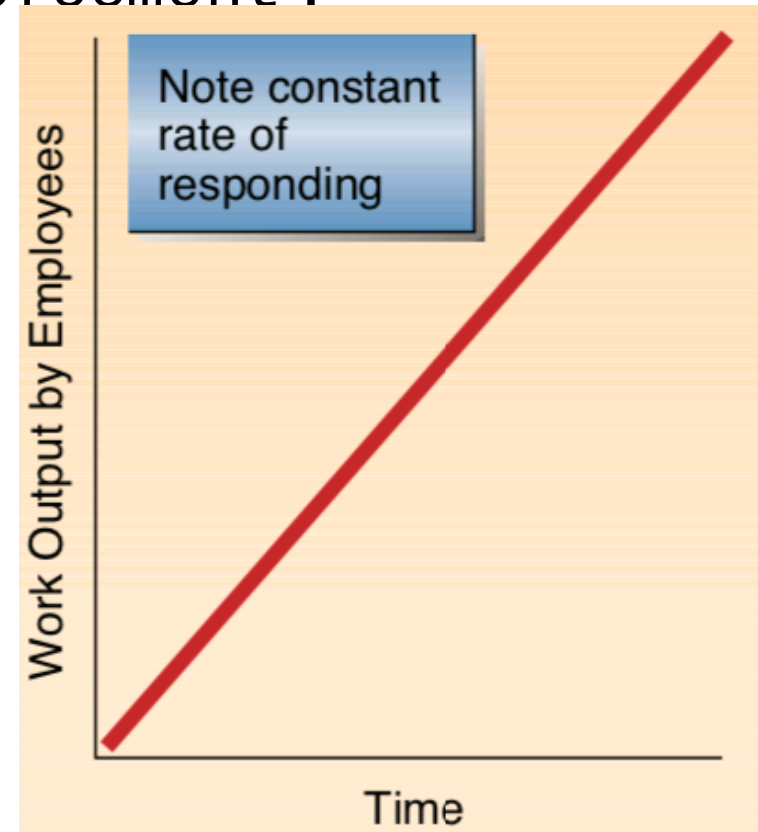❖ Rules determining when and how reinforcements will be delivered.

```
                    Schedules of
                    Reinforcement
                    /          \
         Continuous            Partial (Intermittent)
       Reinforcement              Reinforcement
                                 /              \
                  Ratio Reinforcement      Interval Reinforcement
                      Schedule                  Schedule
                      /      \                  /       \
                  Fixed    Variable         Fixed     Variable
```

Fixed interval

❖ A schedule of reinforcement in which a specific interval of time must elapse before a response will yield reinforcement.

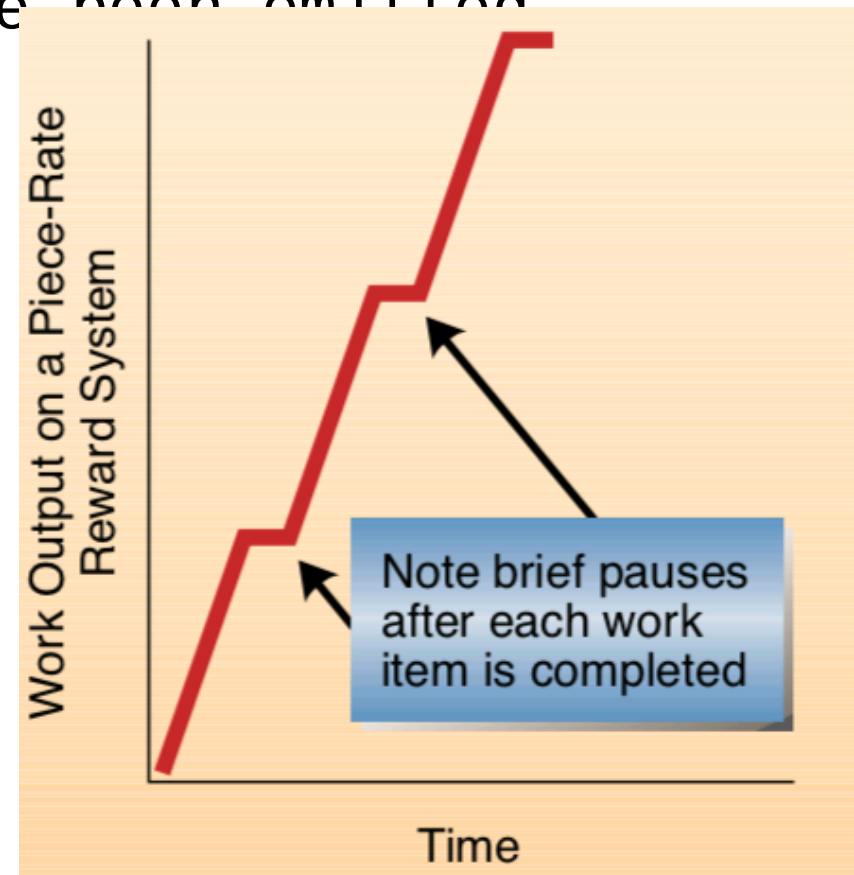# Variable-Interval Schedule

❖ A schedule of reinforcement in which a variable amount of time must elapse before a response will yield reinforcement.

Note constant rate of responding

Work Output by Employees

Time

❖ A schedule of reinforcement in which reinforcement occurs only after a fixed number of responses have been omitted.

Variable-Ratio Schedule

❖ A schedule of reinforcement in which reinforcement is delivered after a variable number of responses have been emitted.

Gambling Behavior (e.g., Slot Machine Plays)

Note constant high rate of gambling

Time