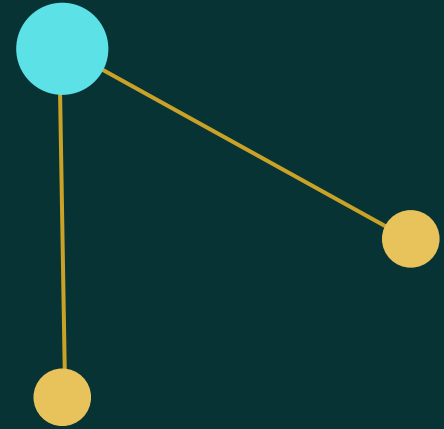




UNIT III • PSYCHOLOGICAL FOUNDATIONS OF EDUCATION

THORNDIKE'S CONNECTIONISM

Trial-and-Error Theory • Stimulus–Response Bond Theory of Learning

Presented By

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Who Was E.L. Thorndike?



- American psychologist — the father of modern Educational Psychology.
- One of the earliest pioneers of behaviourist learning theory.
- Studied learning scientifically through lab experiments, not philosophy.
- Famous work: Animal Intelligence (1898) — puzzle-box experiments on cats, dogs and chicks.

Meaning of Connectionism

“Learning is the formation of connections between stimulus and response, and such connections tend to be strengthened or weakened according to the nature and consequences of the response.”

— E. L. THORNDIKE

In simple words for a classroom teacher:

S



R

=

Habit

Stimulus

Response

Practice + Reward

Nature of the Theory

1

Trial & Error

Learning happens through trial and error — also called 'Selecting and Connecting'.

2

Mechanical Process

Learning is mechanical and physiological — strengthening of neural bonds, not conscious understanding.

3

Stamping In / Out

Every response is either 'stamped in' (strengthened) or 'stamped out' (weakened) by its consequence.

4

Gradual & Incremental

Improvement occurs bit by bit across many trials — not a sudden flash of insight.

5

Universal Law

Applies equally to animals and human beings, as a general law of behaviour.

6

Motivation Is Essential

A felt need, such as hunger, is essential to trigger learning.

04 • THE CLASSIC EXPERIMENT

The Puzzle-Box (Cat) Experiment

Hungry cat placed inside a wooden crate. A lever/string release opens the door. Food is visible — but outside the box.



- A hungry cat is placed inside a specially built wooden crate — the 'puzzle box.'
- A piece of fresh fish is kept clearly visible, just outside the box.
- The box opens only when the cat performs a specific act — pulling a string, pressing a lever, or clawing a button.

What Happened Inside the Box



[CLICK HERE](#) 

1

Random Activity

Cat claws, bites, scratches, and pushes the walls in agitation.

2

Chance Success

By chance, the paw touches the lever — the door springs open.

3

Reward

The cat rushes out and eats the fish — satisfaction follows.

4

Repetition

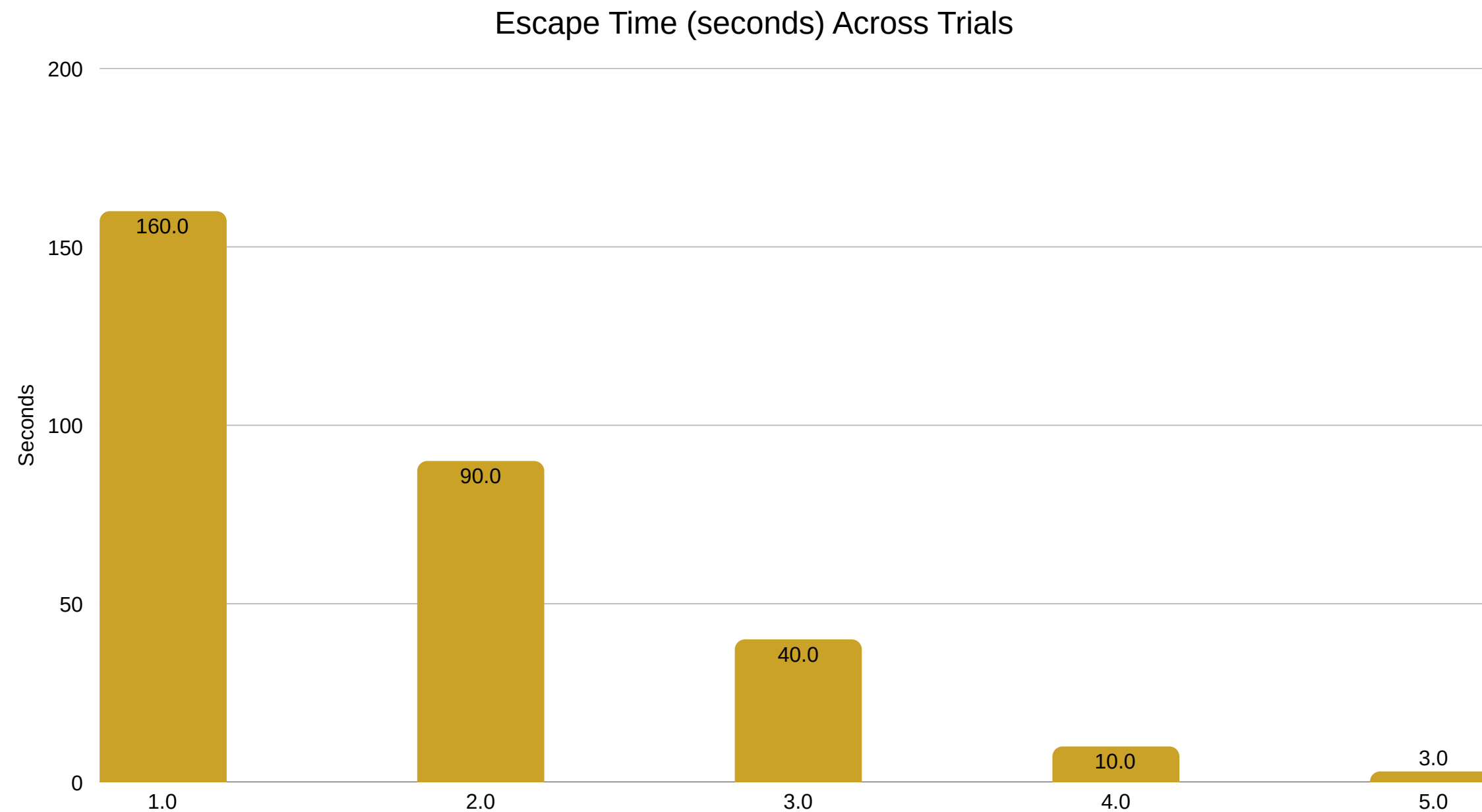
Placed back repeatedly, random activity steadily decreases.

5

Fixation

Eventually the cat goes straight to the lever — instantly.

Time Taken to Escape — Trial by Trial



Reading the Curve

A steadily descending curve,
not a sudden drop.

This is why Thorndike
concluded learning is gradual
and mechanical — built through
trial-and-error and habit, not
sudden insight.

'Selecting and Connecting'



- A felt need (hunger, curiosity) arises, and a goal is perceived that will satisfy it — but a barrier blocks the way.
- The learner tries many responses blindly; one succeeds by chance and is gradually selected and connected to the stimulus.
- With repeated practice, the correct S–R bond becomes fixed and automatic — Thorndike's own term: 'Selecting and Connecting.'

Three Primary Laws of Learning

1

Law of Readiness

Learning works best when the learner is physically & mentally prepared.

2

Law of Exercise

Practice strengthens a connection (**Use**); **disuse** weakens it over time.

3

Law of Effect

Satisfying consequences strengthen a response; annoying ones weaken it.

(a) Law of Readiness

Learning takes place effectively only when a learner is physically and mentally ready to learn.

Ready + Allowed to Act

Satisfaction results

Ready but Prevented

Annoyance results

Not Ready but Forced

Annoyance results

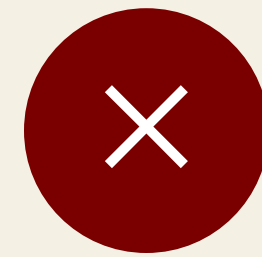
Classroom Example: A ready, well-rested Class VI student grasps fractions far more easily than a distracted, forced learner.

(b) Law of Exercise — Use & Disuse



Law of Use

An S–R connection is strengthened through repeated practice — 'practice makes perfect.'



Law of Disuse

A connection weakens or is forgotten when practice is discontinued over time.

Example: A B.Ed. trainee who repeatedly writes lesson plans grows skilled (Use); a teacher who hasn't taught a topic in years forgets it (Disuse).

(c) Law of Effect

A response followed by satisfaction is strengthened and repeated. A response followed by annoyance is weakened and suppressed.

Rewarded behaviour

is repeated

A child praised for a correct answer participates more.

Punished behaviour

is suppressed

A child scolded for a wrong answer hesitates to volunteer again.

Applying the Theory in Class

1 Assess Readiness First

Ensure learners are mentally & emotionally ready before a new concept.

2 Provide Drill & Practice

Repetition, drill and revision strengthen S–R connections (Law of Exercise).

3 Reward Over Punishment

Praise, stars and grades work better than harsh criticism (Law of Effect).

4 Allow Trial & Error

Let learners attempt motor / practical skills themselves, with guidance.

5 Multiple Attempts

Give children several chances; treat wrong answers as part of learning.

6 Build on Prior Learning

Link new lessons to familiar, analogous knowledge for faster grasp.

7 Sequence the Curriculum

Move simple → complex, with practice exercises at every stage.

8 Foundation for EdTech

Inspired programmed learning, teaching machines & token-economy systems.

Criticism of Connectionism

Over-Mechanical

Gestalt psychologists (Köhler) argued it ignores insight & understanding.

Over-Generalised

Based on cats, dogs & chicks — applied broadly to complex human learning.

Ignores Cognition

Neglects thinking, reasoning, imagination and creativity.

Narrow Motivation

Treats motivation mainly as physiological drive, ignoring interest & self-esteem.

Ethical Concerns

Animals were deliberately starved to induce motivation.

Over-Relies on Reward

Can push learning only for external prizes, not intrinsic interest.

Connectionism in Today's Classroom

1 CCE / Formative Assessment

Regular feedback & grades reinforce learning — the Law of Effect at work.

2 Gamified EdTech Apps

Duolingo, Byju's & Kahoot use points, badges & streaks to build S–R bonds.

3 NEP-2020 Skill Training

Vocational & lab skills rely on repeated, guided practice — Law of Exercise.

4 Token-Economy Systems

Star charts & merit certificates apply the Law of Effect to shape discipline.

5 Readiness-Based Stages

NEP's Foundational–Preparatory–Middle–Secondary stages respect readiness.

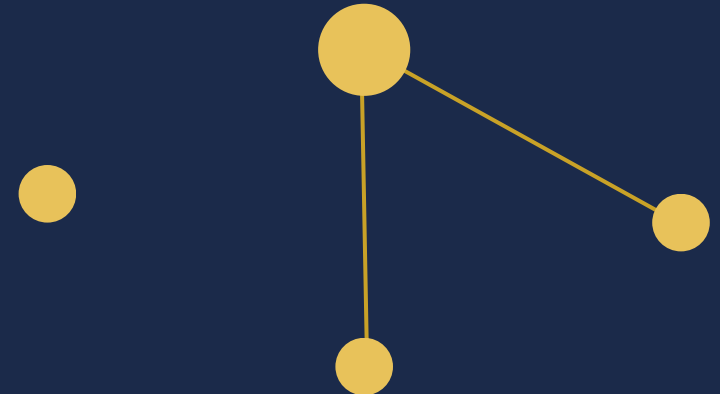
6 NIPUN Bharat Mission

Drill-based practice for foundational literacy & numeracy.

Thank You



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Summary

Propounder Edward Lee Thorndike (1874–1949), Columbia University, USA

Other Names Trial-and-Error Theory · Connectionism · S–R Bond Theory

Chief Experiment The Puzzle-Box Experiment on hungry cats (1898)

3 Primary Laws Readiness · Exercise (Use & Disuse) · Effect

6 Subsidiary Laws Multiple Response · Set/Attitude · Prepotency · Analogy · Assoc. Shifting · Identical Elements

Chief Criticism Too mechanical — ignores insight, reasoning & higher cognition (Gestalt critique)