

Participant Guide

Learning Theory I



Train Systems

About this document

Jun-17

Version .3

Created by Safety, Compliance & Training ISD

Table of Contents

Introduction	6
Course Overview	7
Performance Objectives.....	7
Trains Vision, Mission, & Goals	8
Trains Safety Statement	8
Courtesy Points	9
Behavioral Learning Theory	10
Edward Thorndike (1874-1949)	12
Learning is incremental, not insightful	12
Belongingness	12
Law of readiness.....	12
Revised law of readiness	13
Spread of effect	13
Identical elements of theory	13
Summary	15
BF Skinner (1904-1990)	17
Conditioning.....	17
Learning.....	17
Reinforcement	18
Summary	20
Ivan Pavlov (1849-1936)	22
Excitation and inhibition	22
Irradiation and concentration.....	22
Summary	24

Participant Guide

Edwin Guthrie (1866-1959).....	26
One law of learning (also known as law of contiguity)	26
One-trial learning	26
Regency principle	26
Learning and practice	27
Forgetting	27
Breaking habits.....	27
Punishment.....	28
Transfer of training.....	28
Summary	30
Summary.....	32
Appendix.....	33
Safety Briefing Guidelines	34

Introduction

Course Overview

- Learning Theory I
- Trains employees for Training Delivery development
- X hours X minutes
- 4 modules
- Performance assessment will include questions and answers with tasks

Performance Objectives

At the end of this course, you should be able to do the following:

- Placeholder for course performance objectives
- Placeholder for course performance objectives
- Placeholder for course performance objectives

Trains Vision, Mission, & Goals



Trains vision, mission, and goals 5

VISION: *Moving America where it wants to go*

Delivering intercity transportation with superior safety, customer service and financial excellence.

MISSION:

GOALS:

Safety & Security	Customer Focus	Financial Excellence
Set the standard for safety and security in the transportation industry to ensure that every passenger and employee goes home injury-free every day.	To acquire and retain the most satisfied customers of any travel company in the world.	To be profitable on an operating basis (as defined by our operating ratio) and be good stewards of capital in order to secure our long-term viability as a company.

Train Systems

Trains Safety Statement



Trains remains committed to being the safest passenger railroad in the country, where every passenger and employee goes home injury-free every day. Every employee is empowered and obligated to make safe decisions.

These principles must guide our actions at work at all times:

- Safe behaviors are a condition of employment.
- Working safely is everyone's responsibility.
- Education and accountability are required for good safety performance.

Courtesy Points

- Cell phones silenced; set to vibrate or turned off
- Refrain from texting
- Be respectful of other people's thoughts and values
- Keep side conversations to a minimum
- Allow others to speak without interruption
- Disagreement is okay, as long as it is over ideas
- Ask questions freely and openly
- Learn from everyone
- Have fun!

Activity: Good Times and Bad Times

Purpose:

This activity has participants reflect on past learning experiences they have been a part of and what made the experience either good or bad. Each group will report out the good time and bad time and what made it that way. This allows participants to think about how learning experiences have affected them to build real experiences into the course learning.

Instructions:

Break the class into groups of 3 participants each.

Each group picks a person to:

- share a story of a good learning experience and what made it good;
- share a story of a bad learning experience and what made it bad; and,
- capture a brief summary of each story and the *what* and *why* it was good or bad. This person will introduce to the class who are the group members and report out a summary of the two stories.

Each group has one person to share the team's:

- member names and department
- a two minute summary for each story and what was good or bad (4 minutes combined)

Timing:

- | | |
|------------|--|
| 10 minutes | Each group introduces the members and shares their stories in the group |
| 30 minutes | Each group has five minutes to introduce the team members and share their story summaries with the class |

Behavioral Learning Theory

Important Points to Remember

This is a notes page for the learner.

Edward Thorndike (1874-1949)

Edward Thorndike provided many contributions on reinforcement theory and behavior analysis. He believed that instruction should pursue specified, socially useful goals. His characteristics included:

- Prolific researcher
- Research centered on studying how animals learn
- Learning is building neural bonds/connections between stimulus and response (connectionism)

Learning is incremental, not insightful

Thorndike proposed that:

- Learning occurs in very small systematic steps rather than in huge jumps.

Belongingness

Thorndike further believed that:

- Things that are related or 'belong together' are easier to learn than things that don't.

Law of readiness

- When someone is ready to perform some act, to do so is satisfying.
- When someone is ready to perform some act, not to do so is annoying.
- When someone is not ready to perform some act and is forced to do so, it is annoying.

Revised law of readiness

- Reinforcement increases the strength of a connection, whereas punishment does nothing to the strength of the connection.

Spread of effect

- When someone gains satisfaction with a response, it increases the probability of getting that response. It also increases the probability of getting responses that surround the initial response.

Identical elements of theory

- More training transfers when the situations have similar (or familiar) elements.

Practical Exercise #1

Scenario: The Shipping Department bought five different pieces of equipment and Ted has been assigned to instruct the crew on the proper use of each piece. Ted knows there is a lot to learn because they've never had equipment like this in the Shipping Department before, but he's already very busy with his other work assignments. He wants to get this assignment done quickly, but he knows he also needs the training to "stick."

1. How might Ted structure his instruction knowing that learning is incremental, not insightful?

2. Based on Thorndike's idea of belongingness, how should Ted organize the instruction for the pieces of equipment?

3. How could Ted apply Thorndike's identical elements theory to help the training "stick"?

4. Now that Ted has figured out how to organize the instruction and hopefully make it "stick," what can he do to help the crew be ready to learn?

Summary

The learner should now be able to do the following:

- Explain Thorndike's idea of incremental, not insightful learning.
- Apply Thorndike's idea of belongingness.
- Discuss Thorndike's Law of Readiness and Law of Effect.
- Apply Thorndike's identical elements theory of training transfer.

Important Points to Remember

This is a notes page for the learner.

BF Skinner (1904-1990)

BF Skinner was an American psychologist, behaviorist, author, inventor, and social philosopher. He considered free will an illusion and human action dependent on consequences of previous actions. His contributions included:

- Prolific researcher
- Arrange the environment to change behavior

Conditioning

- Operant (Type R)
 - Emphasizes the response
 - Most of Skinner's work is in this area

In Skinner's research, the term *operant* was used to refer to any "active behavior that operates upon the environment to generate consequences."

A study showed that if mice pressed a blue button, food was received (positive response). If a red button is pressed, a mild electric shock was received (negative response).

Mice learned to press the blue button and avoid the red button.

Learning

- Learning proceeds most effectively if:
 - Information is presented in small steps;
 - Learners are given rapid feedback concerning the accuracy of their learning; and
 - Learners are able to learn at their own pace.

Examples of learners able to learn at their own pace:

- Self study
- Independent reading
- Coaching/mentoring per learner time & opportunity
- Practice (with or without an instructor guiding)

Reinforcement

- A reinforcer is anything that increases the probability of a response recurring.
 - Positive reinforcers – presenting stimuli
 - Negative reinforcers – removing stimuli
 - Controlling reinforcement, controls behavior
- Punishment
- Either take away something an organism wants, or give it something it does not want.
- Temporarily suppresses behavior
- When punishment is removed, the rate of behavior returns to its original level.
- Alternatives to punishment may include:
 - Change circumstances that lead to undesirable behavior
 - Let the organism perform undesired behavior until satiated
 - Reinforce behavior incompatible with undesirable behavior
 - Ignore it
 - Let time pass

Practical Exercise #2

Scenario: Rae has been operating equipment for more than 25 years and is considered an expert by everyone in the organization. His boss asked him to take responsibility for training the new employees to operate the equipment, so they can hopefully become experts like Rae.

1. Using Skinner’s views of learning, how should Rae structure his course?

2. When Rae was a new operator his boss always screamed and yelled at him when he did something wrong. Rae felt this “hammering” made him a better operator. Based on Skinner’s ideas of reinforcement and punishment, what direction and suggestions would you give Rae so he can be a better instructor?

3. How should Rae structure his course if he incorporated ideas from both Thorndike and Skinner?

Summary

The learner should now be able to do the following:

- Explain what Skinner defined as operant conditioning.
- Discuss Skinner's ideas on reinforcement and punishment.
- Apply Skinner's ideas on learning.

Important Points to Remember

This is a notes page for the learner.

Ivan Pavlov (1849-1936)

Ivan Pavlov had an unusual intellectual curiosity and instinct for research in the fields of physiology and psychology. He won the *Nobel Prize for Physiology or Medicine* in 1904 with his extensive work in classical conditioning. His studies included:

- Prolific researcher
- Experiments with dogs and salivation
 - Classical conditioning

Excitation and inhibition

- As events are experienced, they either excite or inhibit cortical activity.
 - Pattern excitation or inhibition called “cortical mosaic”
 - Areas that are active together form temporary connections and “fire” when the others “fire”
 - Dynamic stereotype is a stable cortical mosaic
 - Hard to change, resistance to new conditions

Irradiation and concentration

- Sensory information is projected onto an area of the brain causing excitation.
 - Some excitation spills over to neighboring brain areas – irradiation of excitation.
 - Generalization
 - Similarly, sensory information is projected onto an area of the brain and is inhibited or discriminated.
 - Some inhibition or discrimination spill over to neighboring brain areas.
 - Concentration

Practical Exercise #3

1. From an early age, we teach children that red means “stop” – red lights, red stop signs, red burners on stovetops, etc. Pavlov’s idea of dynamic stereotype suggests that teaching someone to react differently to red, after being conditioned to stop, will be very hard. Come up with two ways to help employees learn that red means “go” when they are at work. Explain exactly how you would help them change their thinking so that when they are outside of work red means stop; but when they get to work, it means go.

2. Using Pavlov’s idea of generalization, identify an existing response that employees have, and how could that understanding be used to teach something similar.

3. Long time employees of the ACME Company have been conditioned that attending training means sitting and “tuning out.” When the new trainer arrives, he is irritated by this behavior and begins punishing employees that don’t participate. What does Pavlov’s research say the new trainer should do? What does Thorndike’s research suggest the trainer do?

Summary

The learner should now be able to do the following:

- Describe Pavlov's idea of conditioned response.
- Apply Pavlov's idea of dynamic stereotype and generalization.
- List challenges associated with Pavlov's theories.

Important Points to Remember

This is a notes page for the learner.

Edwin Guthrie (1866-1959)

Guthrie practiced a theoretical approach to psychology versus an experimental research approach. He is best known for his theory that all learning was based on a stimulus-response association. He:

- Believed all scientific theories can and should be explained using plain, simple words
 - No math
 - No technical jargon
- Placed great emphasis on practical application of his ideas
 - Only one experiment

One law of learning (also known as law of contiguity)

- If you do something in a given situation, you'll likely do the same thing the next time you encounter that same situation. However, it's situational – sometimes conflicting or incompatible tendencies.

Example: A student making a good grade on a test after trying a new study technique makes an association between the stimulus of studying and the response of getting a good grade.

One-trial learning

- Learning is complete after only one pairing between the stimuli and the response.

Regency principle

- In a particular circumstance, whatever we did last (that was successful), we will tend to do again if encountering the same circumstances.

Learning and practice

- Movements – simple muscle contractions (learned all or none)
- Acts – made up of a large number of movements
 - Must be available in differing environmental conditions
 - Requires practice
 - Aren't learned in one trial
- Skill – a large collection of acts/habits that achieve a certain result in many and varied circumstances
 - Lots and lots of practice with many repetitions

Forgetting

- Occurs when an alternative response to a stimuli is learned rather than the original response.
- All forgetting is due to interference.

Breaking habits

- Threshold method
 - Find the cues that initiate the bad habit and practice another response in the presence of these cues.
- Fatigue method
 - Do the act/habit until exhausted by it.
- Incompatible response method
 - Present the stimuli that causes the undesired response and a strong stimulus that causes a response incompatible with the undesired response.

Punishment

- Only effective when it results in a new response to the same stimuli.

Transfer of training

- Practice the exact behaviors in the exact conditions that are going to be demonstrated.

Practical Exercise #4

Scenario: Diana's boss sends her to forklift training so she can help the rest of the crew unload and move materials in the shop. But when she returns from training, her fellow crew members complain that she wasn't properly trained because she does "extra" steps in the process which makes the unloading and moving tasks take her longer than the other crew members.

1. Using Guthrie's ideas, which do you think is the most likely issue in this situation – lack of skill or transfer of training? Explain.

2. Diana's boss is upset that she takes too long to unload and move the materials, so he calls the instructor and asks him to come to the shop and retrain her. When the instructor arrives, he observes Diana operating the forklift as she was trained; however, he notices that the other crew members are using techniques that make the unloading and moving tasks faster, but could lead to unsafe situations. Using Guthrie's ideas, what may have happened that caused the crew members to start operating differently than they were trained?

3. Using Guthrie's methods, what should the instructor do to help the crew members operate the forklift more safely?

Summary

The learner should now be able to do the following:

- Apply Guthrie's One Law of Learning.
- Explain Guthrie's idea of learning and practice.
- Apply Guthrie's Regency Principle and methods for breaking habits.
- Apply Guthrie's methods for breaking habits.
- Explain Guthrie's idea of training transfer.

Important Points to Remember

This is a notes page for the learner.

Summary

You should now be able to do the following:

- Explain Thorndike's idea of incremental, not insightful learning.
- Apply Thorndike's idea of belongingness.
- Discuss Thorndike's Law of Readiness and Law of Effect.
- Apply Thorndike's identical elements theory of training transfer.
- Explain what Skinner defined as operant conditioning.
- Discuss Skinner's ideas on reinforcement and punishment.
- Apply Skinner's ideas on learning.
- Describe Pavlov's idea of conditioned response.
- Apply Pavlov's idea of dynamic stereotype and generalization.
- List challenges associated with Pavlov's theories.
- Apply Guthrie's One Law of Learning.
- Explain Guthrie's idea of learning and practice.
- Apply Guthrie's Regency Principle and methods for breaking habits.

Appendix

Safety Briefing Guidelines

Conduct a safety briefing prior to all meetings.

The safety of each employee is our foremost priority. It is important that every employee receive proper and prompt medical attention and is briefed on emergency evacuation procedures.

- 1. Review the daily security alert (provided in e-mail) and the daily safety tip of the day (if applicable).**

- 2. Preparation prior to evacuation:**
 - a. Identify the location of the emergency exits.
 - b. Explain the alarms, sprinklers and smoke detectors that are utilized.
 - c. Identify the location of the fire extinguishers and pull stations.
 - d. Anyone who is qualified to use fire extinguishers may do so. (Qualified means that you have attended the Trains Fire Extinguisher course).
 - e. Identify hazards in the room (i.e. tripping hazards).
 - f. Have employees note who is seated to their right and left, this will help account for all the employees in the event an evacuation is necessary.
 - g. Ask if anyone needs assistance evacuating the building. Assign a person to assist that individual.

3. Evacuating the building:

- a. Leave the building or follow local instructions immediately upon hearing the alarm or seeing alarm lights.
- b. The elevators will be shut down; do not attempt to use them.
- c. Identify how to get to the stairways that lead to the ground floor.
- d. Identify how to get to the main exit from the ground floor.
- e. Identify the assembly point outside the building (at least one block away from the building).
- f. Do not re-enter the building until the building has been cleared for occupation by proper authority (Fire Department, Police Department, etc.)

4. Emergency Contacts: Have at least two people prepared to call 911 or APD (1-800-331-0008) or a designated number in the event of an emergency.

- a. Post/state the facility address.
- b. Use cell phones if a phone is not available in the room.
- c. If a phone is available in the room, do you need to dial a number to reach an outside line?
- d. When contacting 911 or the designated number include the facility address, city and state.

5. CPR: In the event of a medical emergency, identify someone qualified to administer Cardiopulmonary Resuscitation

- a. If yes - identify them to the class.
- b. If no – emergency services will perform CPR upon their arrival.

Participant Guide

6. AED: If there is an Automated External Defibrillator (AED)

- a. Where are the AED and First Aid Kit located? Give directions.
- b. Assign someone to get the AED and First Aid Kit (if available).
- c. Identify person(s) qualified to use the AED?

7. Active Shooter Threat: Evacuate (RUN) - Hide Out (HIDE)– Take Action (FIGHT)

- a. What is the escape route from the location? Where will you hide?
- b. Determine who will lock or how you will barricade door if necessary?
- c. As a last resort, think about how to disrupt/incapacitate the shooter.
- d. Call APD at 1-800-331-0008, text APD11 (27311) or call 911 when safe to do so.

8. Identify location of restrooms.

(Safety Resource Library, June 2015)