

# Chapter 1:

## Introduction

### *ENHANCED OUTLINE*

#### I. INTRODUCTORY PARAGRAPHS

- A. Many facts and principles about learning and memory processes have been developed since the formal start of psychology in 1879.
- B. These facts and principles have been developed at the same time that everyday individuals have accumulated “common-sense” based notions about the nature of learning and memory.
- C. This book will attempt to merge the “common-sense” notions with the science of learning and memory. Some examples:
  - 1. Spaced vs. Massed practice
  - 2. Forgetting and Hypernesia
  - 3. Feedback and Performance
  - 4. Do subliminal learning tapes actually work?

#### II. THE ORIGINS OF THE STUDY OF LEARNING

- A. The philosophical movements of Empiricism and Rationalism in the 1600s-1700s, and the start of Evolutionary theory in the 1800s fostered a scientific interest in learning.
- B. The field of Epistemology, in general, studies how knowledge is acquired.
  - 1. Is learning due to nature (biological forces) or nurture (experienced-based elements)?
  - 2. Descartes argued that some sources of knowledge can be innate, put into us by God.
  - 3. John Locke and the Empiricists argued that all knowledge is derived from experience.

- a. Empiricism was based on the premise that different laws of Association were responsible for how knowledge was acquired.
  - b. The law of Contiguity suggests that events occurring together in time are associated.
  - c. The law of Frequency argued that events that are repeatedly contiguous are associated.
  - d. The law of Similarity suggests that ideas that resemble one another come to be associated.
  - e. The law of Contrast argues that ideas that are dissimilar become associated together.
  - f. All of these laws function by way of “mental chemistry,” which involves reflecting on existing ideas to produce a novel thought.
- C. Darwin’s “The Origin of Species,” published in 1859, described how organisms evolved over the course of generations.
- 1. A critical notion in Darwin’s work was how the process of adaptation allowed a species to evolve.
  - 2. The connection of evolution to learning is that the capacity to learn evolved as an adaptive specialization.
    - a. Psychologists interpreted Darwin’s work in the context of allowing an individual to learn, and adapt, during the course of one’s lifetime.
- D. Contemporary influences arising from early philosophical and biological ideas include biological preparedness for learning, which has been illustrated in the contexts of language acquisition and other specialized learning systems (such as phobia learning).

### III. THE DEFINITION OF LEARNING

- A. Learning is defined as a relatively permanent change in behavior, or behavioral repertoire, that occurs as a result of experience.
- 1. The changes in behavior may or may not be observable.
  - 2. The types of behaviors that may be taken as evidence of learning include overt behavior of organisms, physiological responses, and verbal reports.

3. The changes in behavior may also not be readily noticed, as an experience may simply result in the potential for behavioral change, contingent upon proper environmental conditions.
- B. Some behaviors that may seem as if they are due to learning are typically excluded from the formal definition of learning.
1. Care must be taken when behavioral changes are attributed to either biology or the environment; these factors tend to interact, making strict divisions between them difficult to see.
  2. Such exclusions include changes in behavior due to physical, neural, and cognitive maturation.
  3. Other exclusions refer to temporary fluctuations in behavior, including changes in arousal, fatigue, or motivation.

#### IV. THE LEARNING / PERFORMANCE DISTINCTION

- A. Behavioral measures are sometimes inaccurate because they fail to show the difference between what subjects know and what they do: this is the Learning / Performance distinction.
- B. The classic example of the Learning / Performance distinction is Tolman and Honzick's (1930) latent learning experiment.
1. In their experiment, Tolman and Honzick studied maze running ability in rats who were either a) never reinforced for running through a maze, b) always reinforced for running through a maze, or c) reinforced for maze running after going through a period where they were not reinforced.
  2. Results revealed that learning ability was slow/nonexistent for rats who were not receiving any reinforcement, but once reinforcement was provided, rats who were previously not reinforced ran through the maze at a rate that was equal to, or faster than, those animals who always received reinforcement.
  3. This "hidden" learning ability, revealed only when necessary, is what latent learning is.
- C. Stereotype threat also illustrates how performance does not always correlate with underlying knowledge.
1. Presenting individuals with a certain negative stereotype may induce that individual to give in to the implied suggestion (e.g., informing an elderly

person that older people tend to be forgetful may result in that person being more forgetful than normal).

V. THE RELATIONSHIP BETWEEN THE TERMS “LEARNING” AND “MEMORY”

- A. The terms “learning” and “memory” have , over the years, referred to different processes.
- B. The term “Learning” has be used in reference to:
  - 1. Conditioning and reinforcement tasks
  - 2. Non-human animal subjects
  - 3. Skills requiring repeated trials for acquisition
  - 4. The unconscious conditioning of specific behaviors
- C. The term “Memory” has been used in reference to:
  - 1. Verbal recall tasks
  - 2. Studies of human subjects
  - 3. Material presented for study just once
  - 4. The conscious recollection of previous experiences
- D. A more specific approach to learning and memory would be to say that “Learning” refers to the acquisition of knowledge, whereas “Memory” deals with retaining and recalling the acquired knowledge.
  - 1. Learning tends to be illustrated by learning curves.
    - a. Negatively accelerated curves show high amount of learning during the early portion of a training period, followed by relatively little improvement in later training episodes.
    - b. “S” shaped curves show little learning at first, followed by the standard negative acceleration curve.
    - c. Power curves illustrate learning as occurring in a constant manner across trials, with straight lines, not curves, representing the progress of a learning period.
  - 2. Memory tends to be illustrated by forgetting curves.

- a. These patterns tend to parallel learning curves, in the sense that when forgetting does occur, it happens to a greater extent at the start of a retention period, with the rate of memory loss slowing thereafter.
- E. Since learning and memory seem to be dependent on one another, some have suggested that the effectiveness of learning is revealed by the level of retention that one exhibits.

## VI. BASIC AND APPLIED RESEARCH

- A. Basic Research seeks to understand the fundamental processes of learning and memory, and involves questions that are not always directly applicable outside of the laboratory.
- B. Applied Research is relevant to answering specific, practical, problems.
- C. Basic and applied research are not totally independent of one another, however, as they tend to feed off of one another to answer questions about behavior.
- D. Research in the fields of learning and memory also tries to distinguish between common sense and common knowledge.
  - 1. Although people have some accurate understandings of how learning and memory operate, many myths still exist.
  - 2. Some of these myths concern the nature of amnesia, eidetic imagery, memory under hypnosis, and the role of forgetting.
  - 3. Many people also believe that one's general memory ability can be improved via practice, but this is not supported by research.
    - a. People can improve specific memory skills (e.g., memory for names or address, random number sequences, etc.), but having a strong memory for a specific domain does not always transfer across other memory areas.
- E. Another major area that is discussed in the context of basic and applied research is the use of animals in research.
  - 1. Animals can be beneficial in the research process for several reasons:
    - a. The experiences of animal subjects before, during, and after an experiment can be more tightly controlled than those of human subjects.