COGNITIVE LEARNING THEORY:LATENT LEARNING

In the early days of behaviorism, the focus of Watson, Skinner, and many of their followers was on observable, measurable behavior. Anything that might be occurring inside a person or animal's head during learning was considered to be of no interest to the behaviorist because it could not be seen or directly measured. The continued interest in the mind was followed, in the 1950s and 1960s, by the interest in *cognition*, the mental events that take place inside a person's mind while behaving, began to dominate experimental psychology. Many behavioral psychologists could no longer ignore the thoughts, feelings, and expectations that clearly existed in the mind and that seemed to influence observable behavior and eventually began to develop a cognitive learning theory to supplement the more traditional theories of learning (Kendler, 1985). Three important figures often cited as key theorists in the early days of the development of cognitive learning theory were the Gestalt psychologists Edward Tolman and Wolfgang Kohler, and modern psychologist Martin Seligman.

Much learning can be explained by classical and operant conditioning. But, as we have seen, even basic conditioning has "mental" elements. As a human, you can anticipate future reward or punishment and react accordingly. There is no doubt that human learning includes a large *cognitive,* or mental, dimension (Lefrançois, 2006).As humans, we are greatly affected by information, expectations, perceptions, mental images, and the like. *Cognitive learning* refers to understanding, knowing, anticipating, or otherwise making use of information-rich higher mental processes. Cognitive learning extends beyond basic conditioning into the realms of memory, thinking, problem solving, and language.

Cognitive Maps

How do you navigate around the town you live in? Have you simply learned to make a series of right and left turns to get from one point to another? More likely, you have an overall mental picture of how the town is laid out. This *cognitive map* acts as a guide even when you must detour or take a new route (Foo et al., 2005). A **cognitive map** is an internal representation of an area, such as a maze, city, or campus. Even the lowly rat — not exactly a mental giant learns *where* food is found in a maze, not just which turns to make to reach the food (Tolman, Ritchie, & Kalish, 1946). If you have ever learned your way through some of the levels found in many video games, you will have a good idea of what a cognitive map is. In a sense, cognitive maps also apply to other kinds of knowledge. For instance, it could be said that you have been developing a "map" of psychology while reading this book. That's why students sometimes find it helpful to draw pictures or diagrams of how they envision concepts fitting together.

Latent Learning

Cognitive learning is also revealed by latent (hidden) learning. **Latent learning** occurs without obvious reinforcement and remains hidden until reinforcement is provided (Davidson, 2000).
Here's an example from a classic animal study: Two groups of rats were allowed to explore a maze. The animals in one group found food at the far end of the maze. Soon, they learned to rapidly make their way through the maze when released. Rats in the second group were unrewarded and showed no signs of learning. But later, when the "uneducated" rats were given food, they ran the maze as quickly as the rewarded group (Tolman & Honzik, 1930). Although there was no outward

sign of it, the unrewarded animals had learned their way around the maze. Their learning, therefore, remained latent at first.

How did they learn if there was no reinforcement? Just satisfying curiosity can be enough to reward learning (Harlow & Harlow, 1962). In humans, latent learning is related to higher-level abilities, such as anticipating future reward. For example, if you give an attractive classmate a ride home, you may make mental notes about how to get to his or her house, even if a date is only a remote future possibility.

TOLMAN'S MAZE-RUNNING RATS: LATENT LEARNING

One of Gestalt psychologist Edward Tolman's best-known experiments in learning involved teaching three groups of rats the same maze, one at a time (Tolman & Honzik, 1930). In the first group, each rat was placed in the maze and reinforced with food for making its way out the other side. The rat was then placed back in the maze, reinforced upon completing the maze again, and so on until the rat could successfully solve the maze with no errors.The second group of rats was treated exactly like the first, except that they never received any reinforcement upon exiting the maze. They were simply put back in again and again, until the 10th day of the experiment. On that day, the rats in the second group began to receive reinforcement for getting out of the maze. The third group of rats, serving as a control group, was also not reinforced and was not given reinforcement for the entire duration of the experiment. A strict Skinnerian behaviorist would predict that only the first group of rats would learn the maze successfully because learning depends on reinforcing consequences. At first, this seemed to be the case. The first group of rats did indeed solve the maze after a certain number of trials, whereas the second and third groups seemed to wander aimlessly around the maze until accidentally finding their way out. On the 10th day, however, something happened that would be difficult to explain using only Skinner's basic principles. The second group of rats, upon receiving the reinforcement for the first time, *should* have then taken as long as the first group to solve the maze. Instead, they began to solve the maze almost immediately. Tolman concluded that the rats in the second group, while wandering around in the first 9 days of the experiment, had indeed learned where all the blind alleys, wrong turns, and correct paths were and stored this knowledge away as a kind of "mental map," or *cognitive map* of the physical layout of the maze. The rats in the second group had learned and stored that learning away mentally but had not *demonstrated* this learning because there was no reason to do so. The cognitive map had remained hidden, or latent, until the rats had a reason to demonstrate their knowledge by getting to the food. Tolman called this **latent learning**. The idea that learning could happen without reinforcement, and then later affect behavior, was not something traditional operant conditioning could explain.