

prototype. Pattern recognition in this case involves comparing the incoming information with the prototype. If a close enough match is found, then the incoming stimulus is recognized as an example of the class of objects or events represented by the prototype. Thus, all of the letters in Figure 3.3, for example, are similar enough to the assumed prototype to be recognized as As.

The prototype model has become popular for explaining pattern recognition, primarily because of evidence that suggests we tend to store prototypic concepts in memory (see, in particular, Eleanor Rosch's work [1973, 1975]). For example, asked to indicate what color comes to mind in response to the verbal stimulus *red*, you are likely to choose a color that is close to fire-engine red. Similarly, reading about Olympic athletes or shore birds tends to evoke general ideas about these concepts rather than specific, previously encountered examples.

A third model of pattern recognition, called feature analysis, presumes that specific, distinctive features are stored in memory. Incoming information is then analyzed for the presence of these features. To consider the letter *A* one more time, its defining features might include the two sides, the angle at which they are joined, and the horizontal connecting line. All stimulus letters would be analyzed for these features and, if found, would be identified as As.

Feature analysis, like the prototype model, is supported by experimental evidence and together, the two models have influenced pedagogical recommendations for concept learning. Tennyson and Cocchiarella (1986) proposed a model for teaching concepts that calls for presenting, first, a best or prototypic concept example followed by a variety of examples that differ from the prototype in systematic ways. The examples help learners to abstract the meaningful dimensions of the concept and determine which features are critical and invariant and which are nonessential and variable across examples.

To see how this model might work, consider one of the concepts from the previous chapter: positive reinforcement. A best or prototypic example might be one in which positive reinforcement is shown with animals and the use of a primary reinforcer. Then, additional examples could be explored in which positive reinforcement is demonstrated with children in school or adults at work and the use of secondary or social reinforcers. Or consider how a medical student might learn to distinguish diseased from normal cells. With stained slides showing clear examples of each for comparison, the student could examine other slides bearing cells that show a range of what is considered normal characteristics and a range of what is identified as diseased.

Although the feature comparison and prototype models account well for most instances of pattern recognition, they also are unable to account for why certain patterns are recognized even though all the features are not