**Chapter 5**

**OBJECT PERCEPTION**

1. Consider the phrase “the absence of information about something is not the same as information about the absence of something”. What might be the implications of this phrase to object recognition, in particular with regard to the idea that visual object recognition requires a lot of inference?

*Hints and discussion: Perceptual inference is usually invoked when an objects shape or size or other characteristics are incompletely specified. Gibson’s ecological approach argues that inference is not required for perception. This question helps students think about the challenges of developing a theory for object perception.*

1. Imagine seeing the letter R. A top-down approach to letter recognition would suggest that you have some knowledge of what the letter R should look like, and this knowledge is used to enable recognition. But think about all of the variations in the letter R – not just in computer fonts but also the endless variety of human handwriting. How does our knowledge of what an R should look like compare to the variety of letters we encounter? How does this knowledge enable recognition when the seen letter is not exactly the same as the mental representation of R? Is it possible to store every possible variation? How can this problem be solved?

*Hints and discussion: This question helps students think about the challenges in developing a theory for object perception, and shows in particular some of the difficulties in top-down theories. This question can be used to set up a presentation of feature detection theory, template theory, or geons.*

1. Recall from Chapter 4, Hubel and Weisel discovered simple cells, which were cells in visual cortex that responded to lines of a specific orientation. How could these cells be incorporated into an object recognition theory?

*Hints and discussion: This question helps students think about the challenges in developing a theory for object perception, and provides clues to how a bottom-up approach might work.*

1. The textbook discusses the perception of animate and inanimate faces, and raises the issue that some inanimate doll faces appear creepy because they may have realistic features except for obviously inanimate eyes. Research on robots has raised a similar question regarding a phenomenon known as the “uncanny valley”. Imagine a continuum of behavior. On one end is a simple and very un-humanlike robot, which may include various industrial robots capable of only routine and repetitive tasks. At the other end is a normal human, capable of complex and intelligent behavior. In between are humanoid and non-humanoid robots capable of some degree of complexity in behavior. As we move from one end of the scale to the other, the robots become more and more human like, both in appearance and apparent complexity of behavior. When people are asked to rate these robots on some dimension, such as “trust”, “familiarity”, or “likeability”, their judgments increase as they move up the scale – but only to a point. At some point where the robot begins to appear human-like in some areas but still retains features that are obviously inhuman, the creepiness factor comes into play, and the ratings plummet. Judgments do not increase until one moves further up the scale toward the real human. Thus the “likeability” curve has a valley in the “creepy” region. Some even argue that zombies represent the epitome of creepiness, having the uncanny combination of human and inhuman characteristics. What do you think accounts for this apparent creepiness? What can it tell us about object, face, and person perception?

*Hints and discussion: This question allows for the discussion of animacy, the minds of others, philosophical concepts like the “problem of other minds” and philosophical zombies, and enables connections to be made between perceptual science and social psychology.*