

Study Guide for the first examination (Tuesday, 17 October 2006). Be able to answer the following questions and be familiar with the concepts involved in the answers.

1. Describe the classical psychophysical methods of Fechner: the method of adjustment, the method of limits and method of constant stimuli.
2. Using your weight judgment experiment as an example, draw a psychometric function relating probability of making a “heavier” judgment to the weight of the test stimulus. Label both axes. Explain how the just noticeable difference (JND) is defined. Illustrate the JND on your graph of the psychometric function.
3. From the basic detection paradigm, define hit rate and false alarm rate. Describe the receiver operating characteristic (ROC) predicted by the High Threshold Model and the ROC predicted by the Signal Detection Theory of detection. How do you compute sensitivity (d') from the hit rate and the false alarm rate for the equal-variance dual-Gaussian signal detection model? (Memorize the formula).
4. Be able to identify the following parts of the eye: cornea, lens, pupil, iris, sclera, aqueous humor, vitreous humor, choroid, retina, optic disk and optic nerve.
5. Define the term “receptive field.” Describe the receptive fields of retinal ganglion cells. How do ganglion cell receptive fields differ from those of cells in the primary visual cortex?
6. Describe and illustrate an explanation of the Hermann Grid phenomenon based on ganglion cell receptive field characteristics.
7. What happens to contrast sensitivity and visual acuity as illuminance goes down? Why is it hard to read at night without artificial illumination?
8. If a person is injured in the upper left region of the primary visual cortex, what change in vision, if any, do you expect?
9. Name and illustrate three laws or principles of Gestalt perceptual organization.
10. Discuss the evidence that our color vision is based on three different types of cone receptors. What is the evidence supporting the existence of opponent process color mechanisms.
11. What are the major types of color defective vision and what are their causes? What kind of color experiences might a deuteranope have?
12. When a person loses one eye, why is depth perception not lost?
13. Describe the “size/distance” (size constancy) hypothesis of certain visual illusions. Pick two such illusions and explain them in terms of this hypothesis.
14. How can you enhance the impression of depth in a photograph or representational painting while viewing it? Why?
15. What do the McCollough effect and the spiral aftereffect have in common? What implications does the later have for models of motion perception?