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Study Guide for the first examination (Tuesday, 11 October 2005). Be able to answer the following questions and be familiar with the concepts involved in the answers.

1. What is the difference between a within-subjects and a between-subjects experimental design? For which design is a repeated-measures ANOVA appropriate?

2. What are the three classical methods that Gustav Theodor Fechner developed to measure internal sensory thresholds? Which method did you use in the Weight Lifting Lab?

3. Describe the ROC predicted by the High Threshold Model and by Signal Detection Theory of detection. How do you compute sensitivity (d') and decision criterion (X_c) from the hit rate and the false alarm rate for the equal-variance dual-Gaussian, variable-criterion signal detection theory model?

4. Draw a diagram of the eye including the following structures: cornea, lens, pupil, iris, sclera, aqueous humor, vitreous humor, retina, optic disk and optic nerve.

5. Draw a diagram of the retina including the following parts: rods, cones, horizontal cells, rod bipolar cells, cone bipolar cells, amacrine cells, p-ganglion cells, m-ganglion cells and the optic nerve.

6. Draw a diagram of the major neural pathways from the retina to cerebral cortex.

7. Define the "receptive field" of a cell. Describe the receptive fields of retinal ganglion cells. How do they differ from the receptive fields of cells in the primary visual cortex?

8. Why do dark-adaptation curves and the Purkinje shift indicate that there are two receptor systems in our retina?

9. Four important stimulus variables affect the visibility of a target are contrast, size, exposure duration, and average level of illumination. What are their effects?

10. How does the sensitivity of the visual system differ for sine and square waves? Why? What information are high spatial frequencies primarily carrying? What about low spatial frequencies?

11. What are the following principles of Gestalt perceptual organization: similarity, proximity, and good continuation?

12. 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.

13. What are the major types of color defective vision and what are their causes?