

9.01 Study Questions

Sessions 2 and 3:

From the Lecture --

1. If phrenology was a “false science”, how could it have had an important and positive influence on the development of neuroscience? (see also the readings)
2. Contrast the contributions of Paul Broca and Karl Wernicke to functional localization studies of the human brain. (See Rosenzweig p.528-539, especially the figures.)
3. Contrast the contributions of Fritsch and Hitzig on the one hand, and Betz on the other, to functional localization in the neocortex. What is a Betz cell?
4. What is a “clinical map” of the human brain, and how can it be misleading?
5. Pierre Fleurens was publishing books on his experiments with brain lesions in animals at the same time that the literature of the phrenologists was appearing. He found evidence for functional localization, yet he is often classified with the “anti-localizationists”. This is also true for Karl Lashley. Explain.
6. What is wrong with the sentence, “Hunger is localized in the hypothalamus?”
7. What was wrong with the conclusion of physiological psychologists that claimed evidence that sexual function was located in the neocortex of the male, but not the female, rat?
8. Evidence for clear correlations of brain events and behavioral events are always fascinating, especially when the data are obtained from humans. Modern “functional imaging” methods are providing much data of this kind. Comment on the limitations of such data.
9. Will scientists ever be able to build an android like Data in Star Trek? Will such a creature necessarily be so lacking in human emotion?

From Readings --

1. What might you hypothesize if you find that a). some feature of the nervous system is much the same in two species that are extremely different(like squid and humans)? b). some feature of the nervous system is quite different in two species that are closely related (like chimpanzees and humans)?
2. How can developmental research shed light on the organization of the nervous system? Use the development of memory as an example.

3. What are the independent variable and dependent variable of somatic intervention, behavioral intervention and correlation experimental approaches in biological psychology, respectively?
4. What does the term 'neural plasticity' refer to? Give examples.
5. What is the basis for saying that "what is true of E. coli is true of the elephant"? In what ways does this generalization not hold true?
6. What are the main points in D.O Hebb's book 'The organization of behavior'?
7. For each of the sections that follow, prepare two brief statements: one concerning the nature of the problem, and one concerning current research on that topic.
 - a). Problem: Growth and development of the nervous system.
 - b). Problem: Processing of sensory information by the nervous system.
 - c). Problem: Basis of sexual orientation.
 - d). Problem: Brain regions underlying emotions.
 - e). Problem: Storage of information by the brain
 - f). Problem: Neural bases of language.