

Principles of Cognitive Neuroscience
Study Guide – Chapter 26

1. What is Charles Darwin theory of evolution as presented in *On the Origin of Species* (1859)? What is a common ancestor? What are morphological traits? What are behavioral traits? What is adaptation? What is ethology?
2. What is the relationship between absolute brain size and cognition? What is the relationship between relative brain size and cognition? What is allometry? What is the relationship between cerebral complexity and cognition? What is the importance of the neocortex? What is gyrification and why does it occur? What does the gyrification index measure? What is the relationship between the complexity of neuronal circuitry and cognition? What is the relationship between changes in certain families of genes (i.e. microcephalin-1) and cognition?
3. What problems occur when trying to measure the relative intelligence of different individuals? What problems occur when trying to measure the relative intelligence of different species? What solutions have been offered?
4. What is an adaptive specialization? What did John Garcia show in his experiments with rats at UCLA in the 1960s? What is Jerison's principle of proper mass? What are some examples of this in animals (i.e. larger superior colliculus in animals that use mostly visual information, larger inferior colliculus in animals that use mostly auditory information)? What are functional neural modules? What is mosaic brain evolution?
5. What is unique about the primate brain? In terms of overall size? In terms of the size of the neocortex? In terms of functional modules? In terms of neuron types?
6. What is the foraging hypothesis? What is the social intelligence (Machiavellian) hypothesis?
7. What are spindle cells? Where in the brain are they found? In what animals are they found? What types of receptors do they have and what roles do these play? What has this led John Allman to conclude about the purpose of spindle cells?
8. What has occurred in the evolution of hominids? And what in particular makes humans unique?