Principles of Cognitive Neuroscience
Study Guide – Chapter 3

1. What are clinical-pathological correlations? What are the advantages and disadvantages of studying naturally occurring lesions in stroke patients? What are the advantages and disadvantages of making experimental (electrolytic or surgical) lesions in animals?
2. What is a pharmacological perturbation? What are agonists? What are antagonists? What does it mean to administer an agent systemically? How is this performed? What are the disadvantages with doing so? What does it mean to administer an agent locally? How is this performed? What are the advantages with doing so?
3. What is intracranial brain stimulation? How is it performed? What happens with moderate stimulation? What happens with strong stimulation? What are the advantages and disadvantages?
4. What is transcranial magnetic stimulation (TMS)? How is it performed? What does it do? What happens when a series of TMS pulses is applied (i.e. 1 pulse per second for several minutes)? Why would you use this method? What happens when a single TMS pulse is applied? Why would you use this method? What are the advantages and disadvantages?
5. What is direct electrophysiological recording? How is it performed? What can you measure with extracellular recording? What can you measure with intracellular recording? When would you use a hollow electrolyte-filled glass electrode? When would you use a tungsten or steel electrode? What are the advantages and disadvantages of this technique?
6. What is a peristimulus histogram? How is it constructed? What is a neuronal tuning curve? How is it constructed?
7. What is electroencephalography (EEG)? Who invented it? How is it performed? What does it measure? What is it normally used for? What are frequency bands? What are the advantages and disadvantages of this technique?
8. What are event-related potentials (ERP)? What neural activity do they reflect? How are they extracted from EEG? How are they named? (i.e. “polarity and latency” or “polarity and order”) How are they graphed and why is this tricky? (i.e. graph with time versus voltage with negative voltage on the top half and positive voltage on the bottom half, which is the reverse of what you might expect) What additional information can be measured when many (64+) electrodes are used? What are source analysis algorithms? What is the inverse problem? What are the advantages and disadvantages of this technique?
9. What is magnetoencephalography (MEG)? How is it performed? Why does MEG only pick up sulcal activity?
10. What is positron emission tomography (PET)? How is it performed, that is, how does the machine work? What are the advantages and disadvantages of this technique?
11. What is functional magnetic resonance imaging (fMRI)? On what principle does it work? What is the blood oxygenation level-dependent (BOLD) signal? How is

it performed, that is, how does the machine work? What are the advantages and disadvantages of this technique?

12. What is hemodynamically-based optical brain imaging? On what principle does it work? How is it performed? What are the advantages and disadvantages of this technique?
13. What is event-related optical signals (EROS)? On what principle does it work? How is it performed? What are the advantages and disadvantages of this technique?
14. What is an association? What is a disassociation? What is a double disassociation?
15. What are the relative advantages and disadvantages of each of these techniques compared to the others? What are some examples of multimethodological approaches?