



These notes represent a detailed interpretation of the professor's lecture. They are not a transcript of the lecture. TakeNote® is best used as a supplement to your own notes, not as a substitute.

Lecture Date: Wednesday, March 8, 2006

Announcements:

- Extra Credit: Required Caucasian Males; experiment lasts for 30 minutes, sign up sheets in class.
- Extra Credit: Required Girls and Boys; Social Psych lab G77.
- Since the Mean = 77.4%, the exam grades will NOT be curved.

I. Behavioral and Neural plasticity

A. Structure of a neuron : A neuron consists of :

1. A Cell body.
2. Dendrites: These are small branch-like projections through which the neuron receives input from other neurons.
3. Axon: A long projection of the nerve cell, which transmits electrochemical signals received by the cell to the synapse.

B. When a signal is received in the cell body, the impulse travels down the axon to synapse which is the point where one neuron meets another neuron.

C. The axon is covered with a myelin sheath which provides electrical insulation.

D. Myelination of neurons makes for efficient and faster neuro-transmission down the axon.

E. On an average a Neuron in the human brain has 7000 synapses.

F. An adult brain has about a 100 billion neurons.

G. Neurons in average human brain have 100 to 500 Trillion synapses. A 3 years old infant has about 5000 trillion synapses.

H. There is a major reduction in the number of synapses over time.

I. Arborizations (branching) of neurons in the brain increases over time.

J. Neural architecture is by no means stable and plasticity is the defining feature of the brain.

K. Graph of Synaptogenesis: Initially, new synapses are formed extensively by neurons and then pruned.

1. A metaphor for this phenomenon is a Bonsai Tree where it is first allowed to grow unchecked for a while and then pruned to assume whatever tree is being modeled.
2. In infants, 3 to 12 months old, density of synapses is double of that in adolescents.
3. All of this happens in the context of major behavioral changes and milestones of development such as the Piagetian stages and the acquisition of language and so on.
4. There is a huge decrease from the ages of 10-20 and then the graph only goes downhill from there.