

Physiology 67

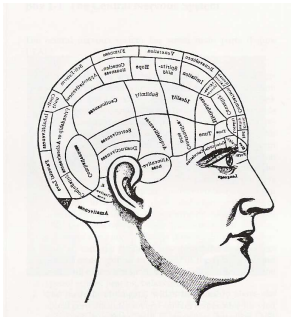
Emotion



Phineas Gage

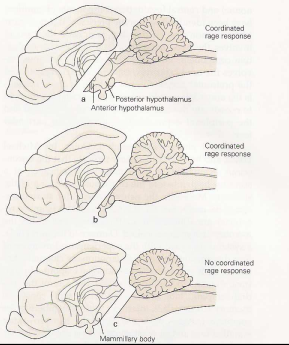


Emotion its all in your head

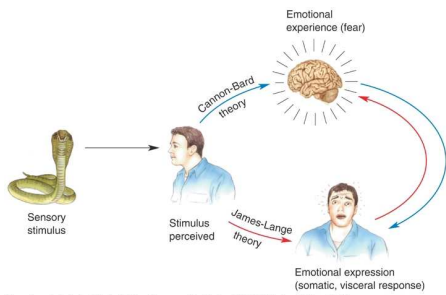


- James-Lange theory of emotions
emotions are results of cognitive responses to information from the body

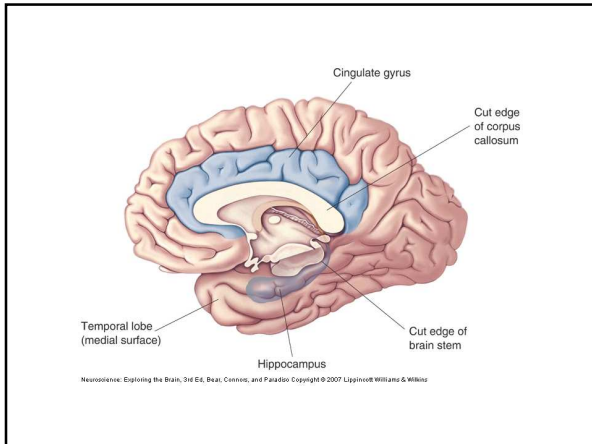
Cannon Bard Theory of Emotion

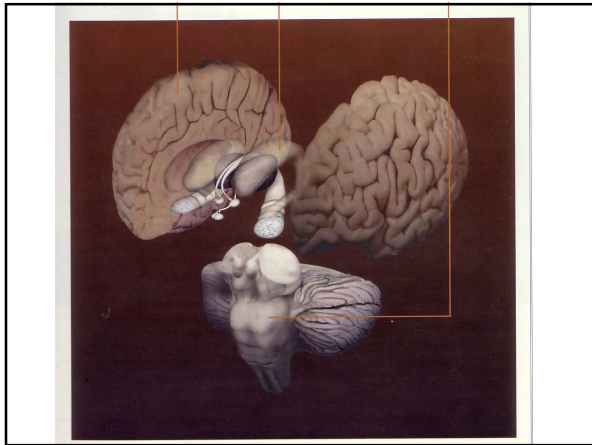


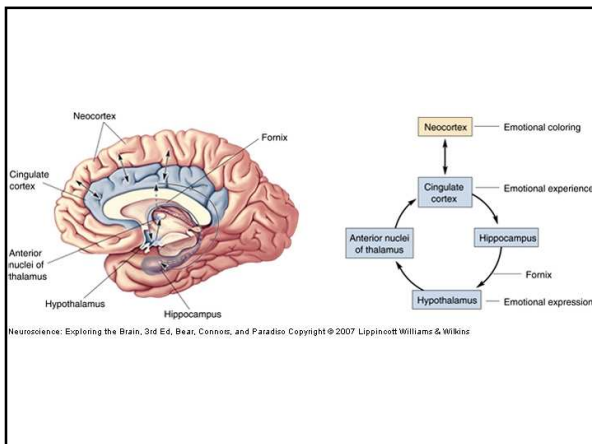
- Three ways to cut a cat



Neuroscience: Exploring the Brain, 3rd Ed., Bear, Connors, and Paradiso Copyright © 2007 Lippincott Williams & Wilkins





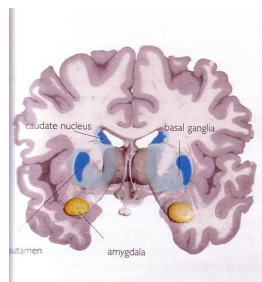
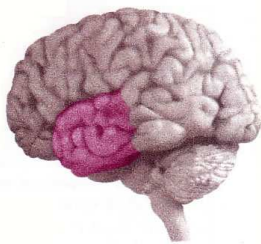


Lets focus on one emotion

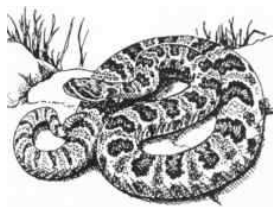
Perhaps one in which we can draw parallels between animal and human studies

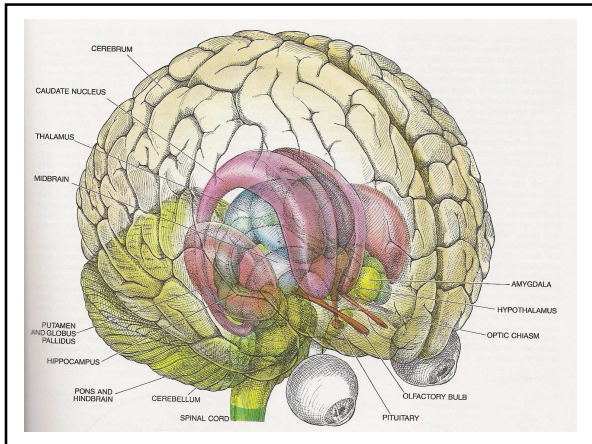


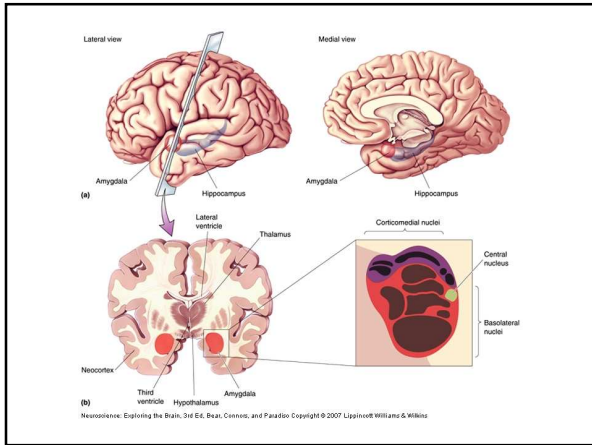
Temporal lobe studies on Monkeys

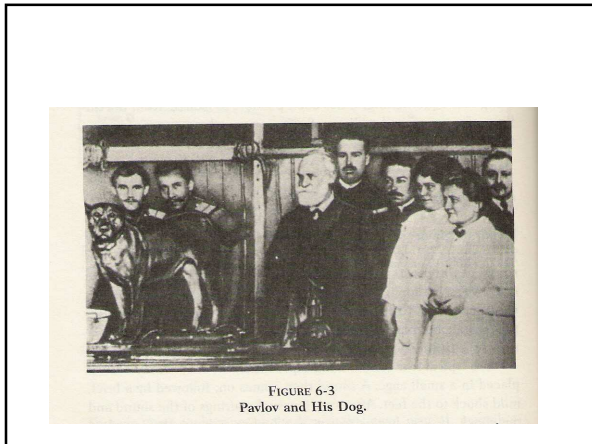


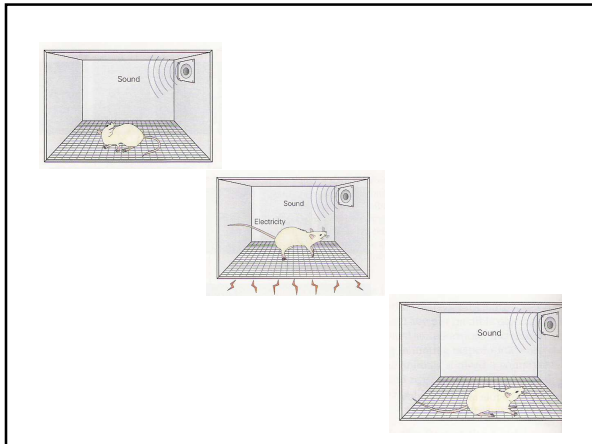
What are you afraid of?

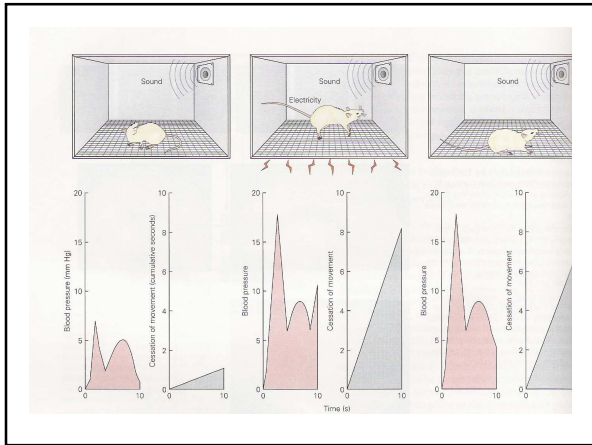













Some Species That Exhibit Fear Conditioning




Fruit fly



Marine snail



Fish



Lizard



Human




Baboon



Macaque

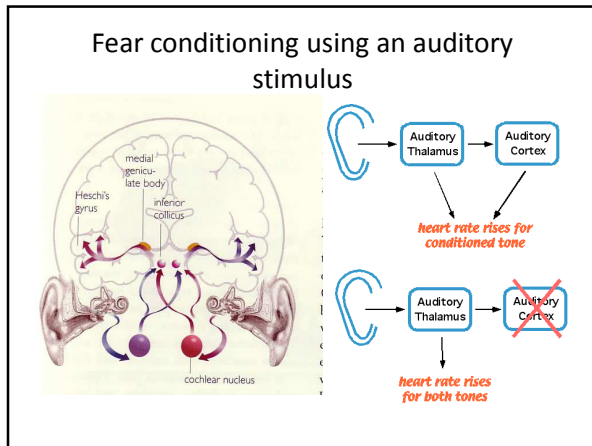


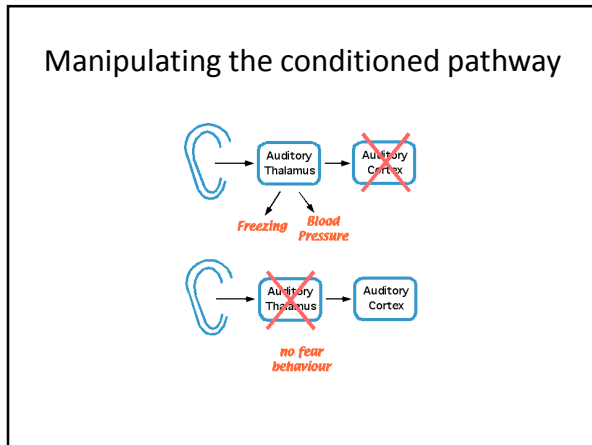
Cat

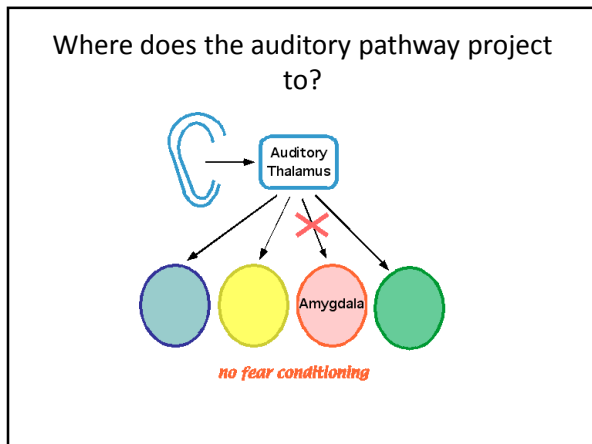


Dog

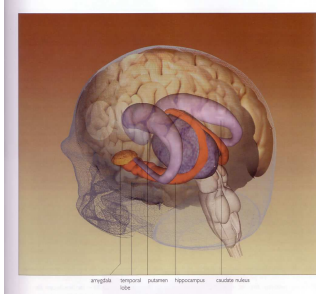
Emotional memories brought about by fear-conditioning experiments have been observed in many animal groups. It appears that once a fearful memory has been established, it is relatively permanent: changes in behavior can be brought about by controlling the fearful response rather than by eliminating the emotional memory itself. This continuity between findings in diverse species suggests that brain pathways for this form of learning are similar. A fuller understanding of these mechanisms in animals may lead researchers to new treatments for fear disorders, such as panic attack or phobia, in humans.

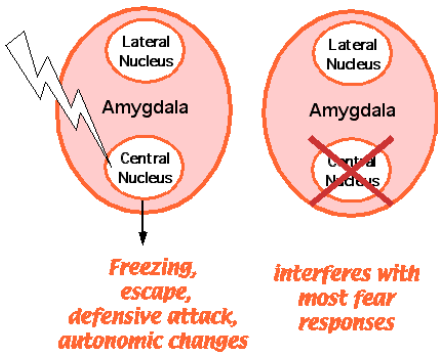




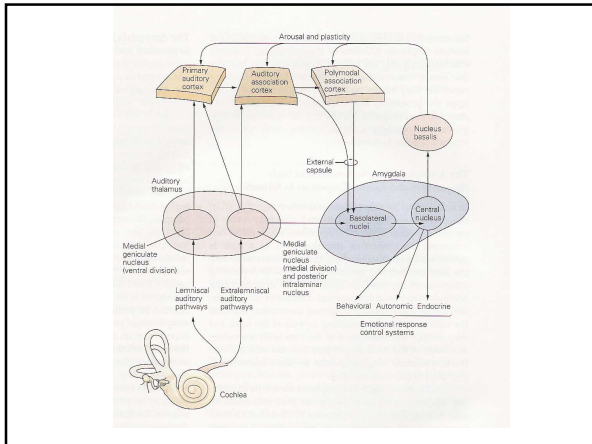


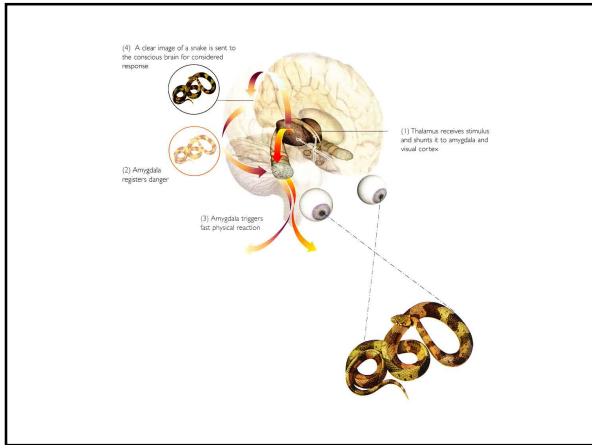
The Amygdala

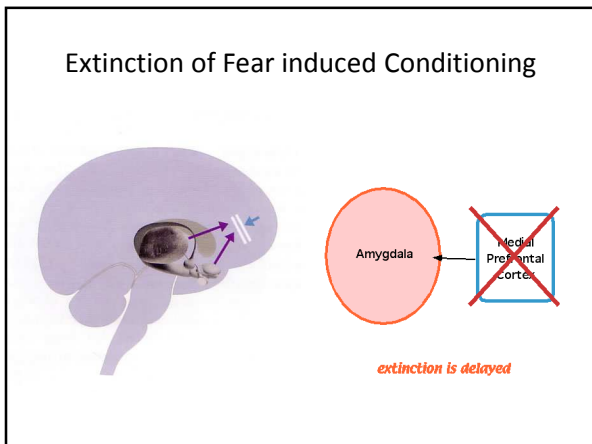




Anatomical target	Effect of amygdala stimulation	Behavioral test or sign of fear or anxiety
Lateral hypothalamus	Sympathetic activation	Tachycardia, galvanic skin response, paleness, pupil dilation, blood pressure elevation
Dorsal motor n. of vagus Nucleus ambiguus	Parasympathetic activation	Ulcers, urination, defecation, bradycardia
Parabrachial nucleus	Increased respiration	Panting, respiratory distress
Ventral tegmental area Locus ceruleus Dorsal lateral tegmental n.	Activation of dopamine, norepinephrine and acetylcholine	Behavioral and EEG arousal, increased vigilance
N. reticularis pontis caudalis	Increased reflexes	Increased startle
Central gray	Cessation of behavior	Freezing, conflict test, CER, social interaction
Trigeminal, facial motor n.	Mouth open, jaw movements	Facial expressions of fear
Paraventricular n. (hypothalamus)	ACTH release	Corticosteroid release ("stress response")







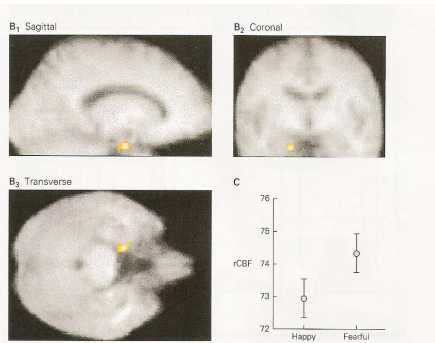
This is all fine in lab rats but humans are not rats



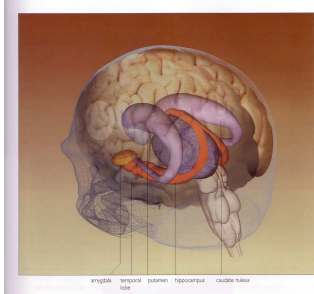
Urback-Wiethe disease



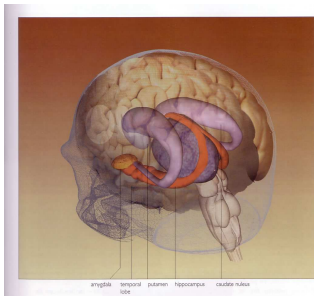
Evidence that the Amygdala is involved in fear in Humans



Hippocampus anatomy



Memory and Fear pathways are not static they interact and can loop



Phobias, Panic disorders

