

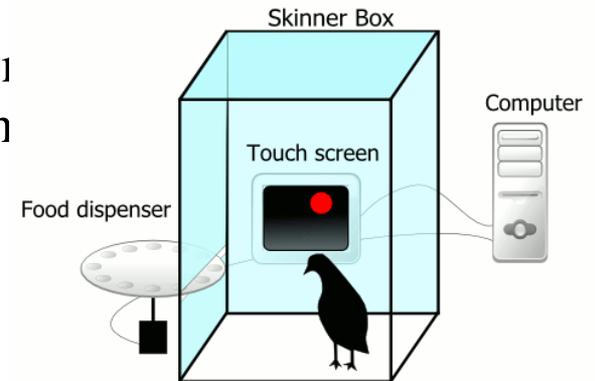
Neuroscience:
Where real men can talk about emotions

Generalization

- In 1920, Watson and Rayner showed that one-year old Albert feared a rat that was previously paired with banging of steel rail. They then showed that he was afraid of other white furry objects as well.

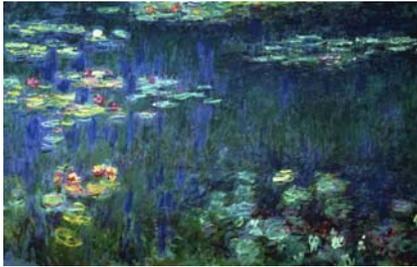
- Pavlov, 1927: drooling to similar sounds

- Stimulus generalization: the behavioral fact that a condition response formed to one stimulus may also be elicited by other stimuli which have not been used in the course of conditioning.



Categorization

Monet



Cezanne / Renoir



Matisse / Braque

Picasso



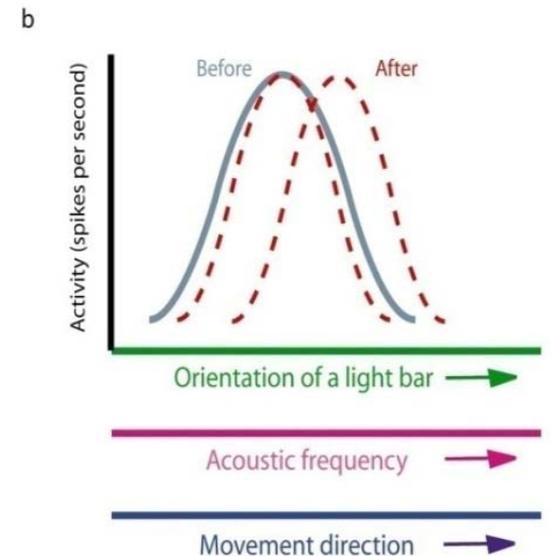
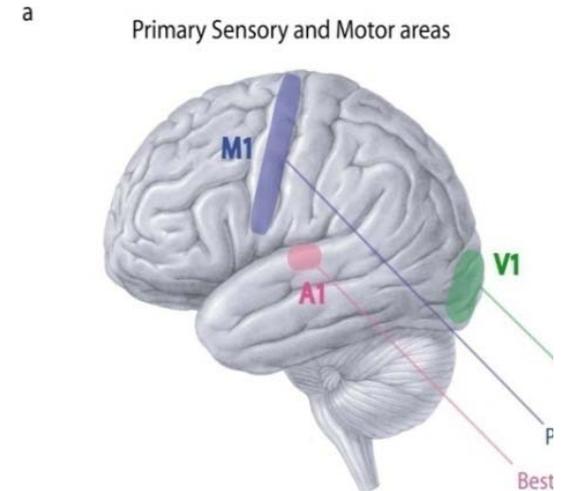
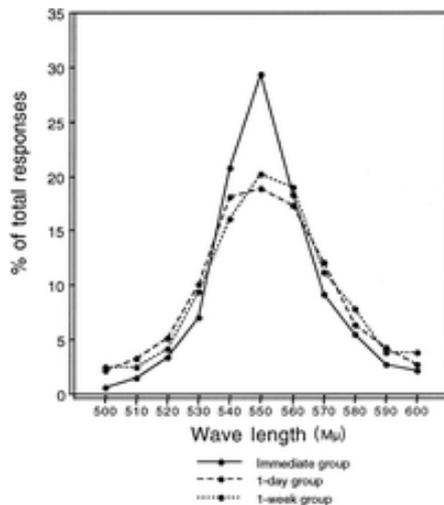
Watanabe, 95

Context generalization

- In fear conditioning, usually performed by training in one chamber, then testing in another.
- Mainly used with extinction: training in one chamber, extinguished in another.
- Implications for PTSD.
- Involves interactions between the amygdala and the hippocampus

Stimulus generalization

- Stimulus generalization on a physical dimension
- Neurons in many brain areas have tuning curves to a physical dimension
- Is generalization merely a result of discrimination?
- Earlier ideas: “subjects will generalize to the extent that they cannot discriminate”

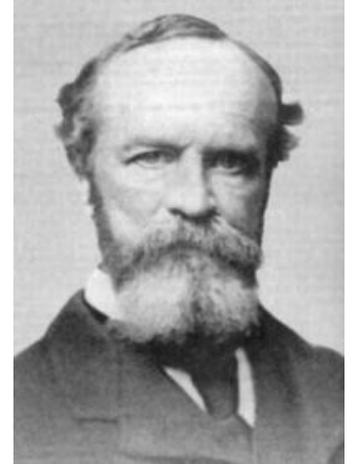


What are emotions?

Do we run from a bear because we are afraid,
or are we afraid because we run?

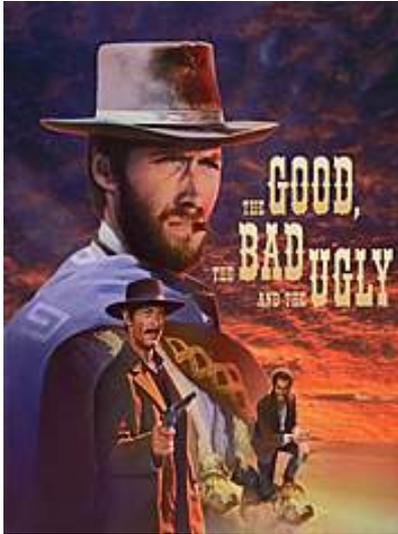
James proposed that the obvious answer, that
we run because we are afraid, was **wrong**,
and instead argued that we are afraid
because we run.

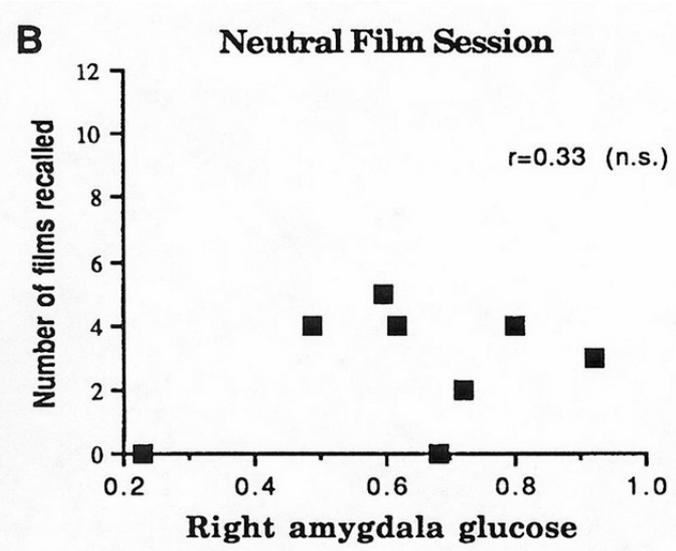
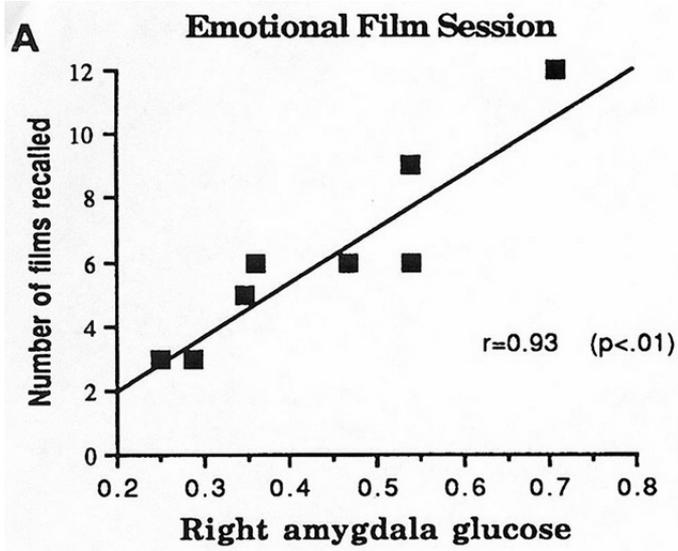
Perception=>bodily changes=>feeling



William James
1842-1910

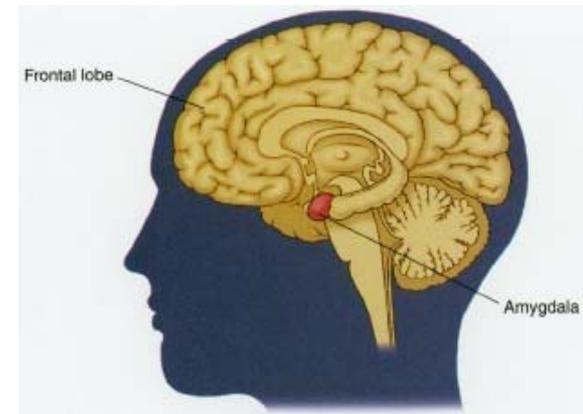
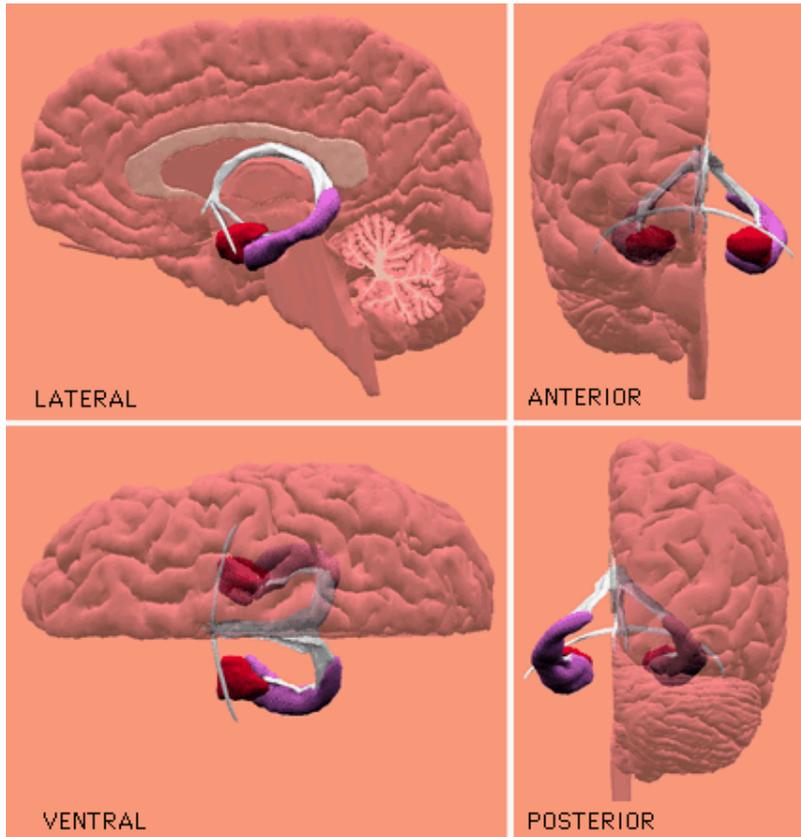
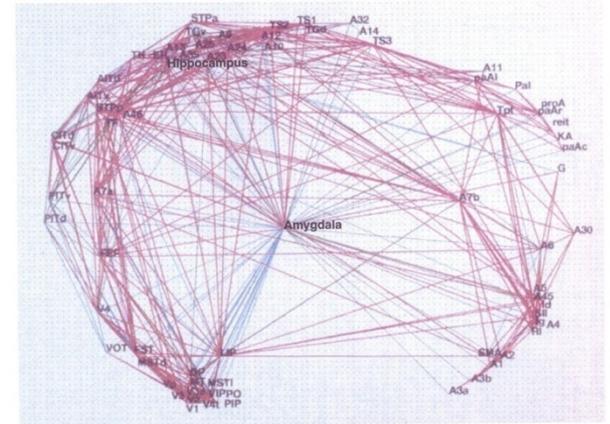
The good , the bad, and why it is easy to remember them



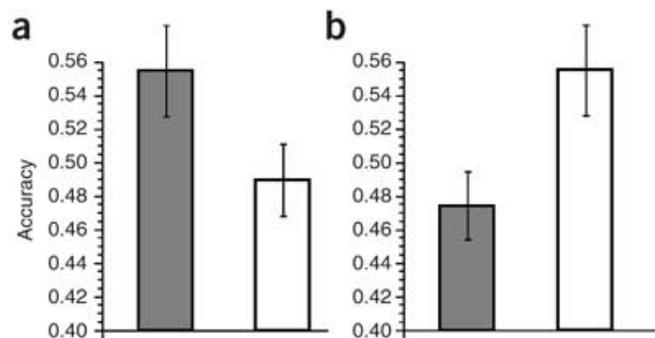


Cahill et. al. PNAS, 1996

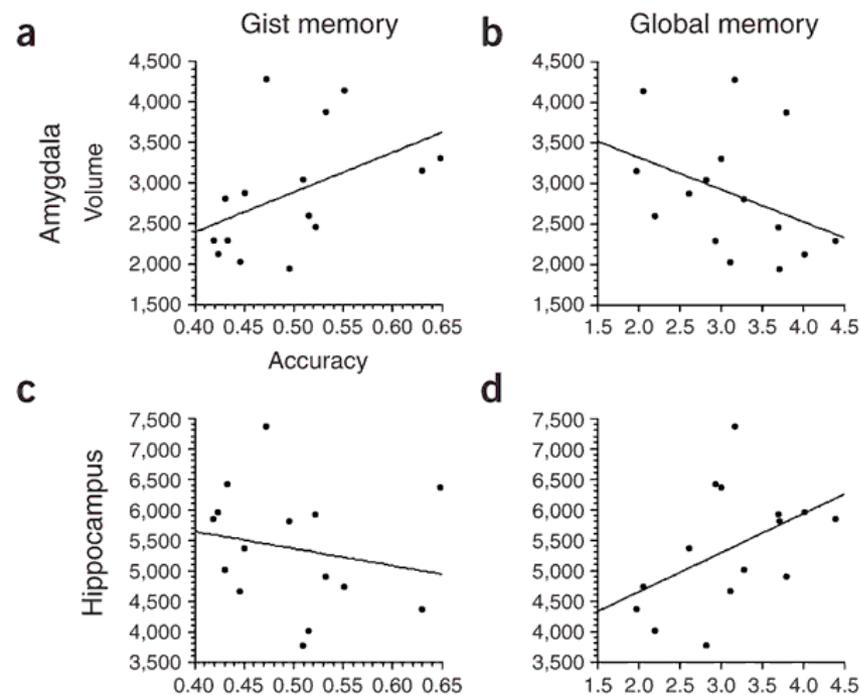
The amygdala

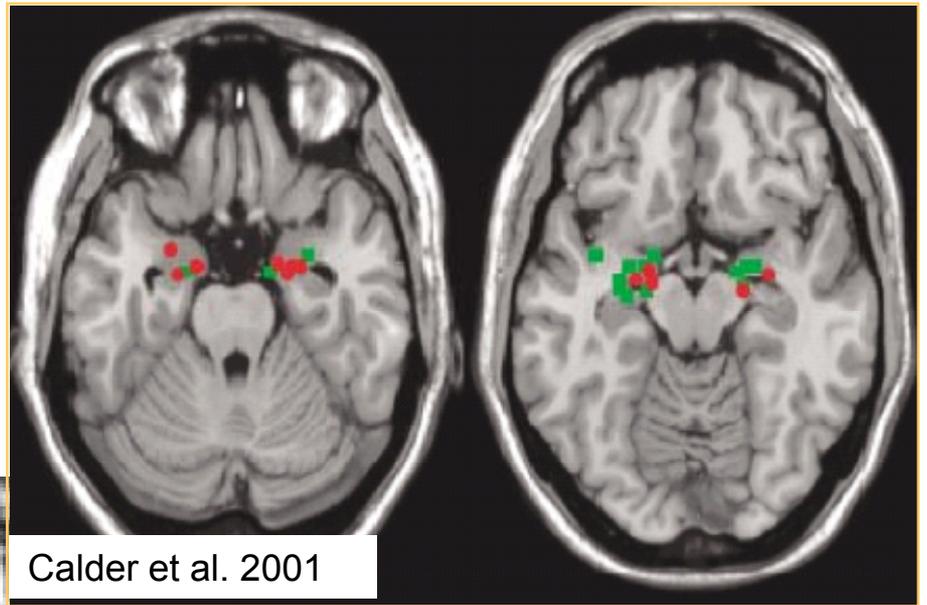


- Under emotional context:
- Enhanced memory for gist, but not to details
- But not without amygdala



Proportional gist memory (mean \pm s.e.m.) is shown for the emotional (gray bars) and neutral (white bars) encoding conditions. (a) Normal controls ($n = 21$). (b) Subjects with unilateral damage to the medial temporal lobe ($n = 12$).

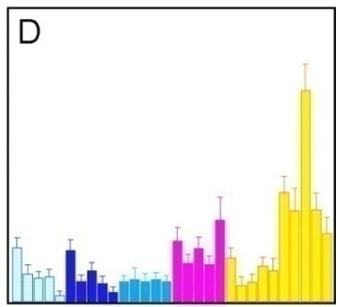
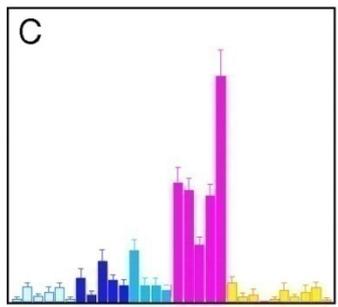
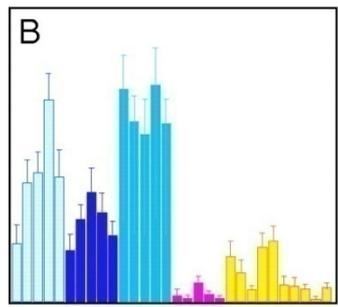
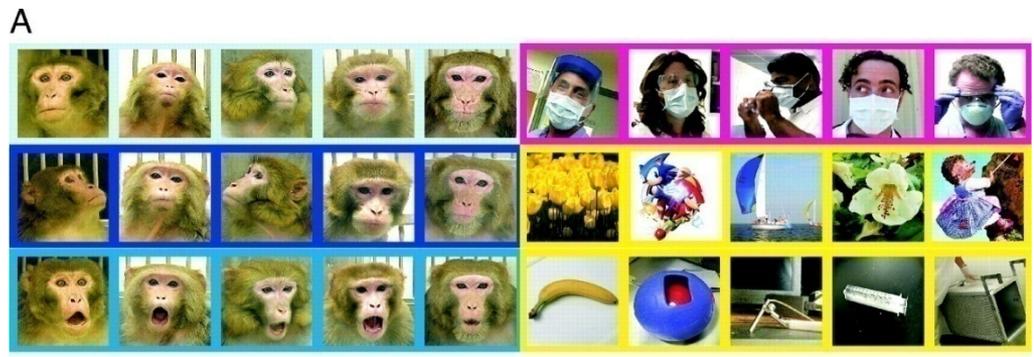
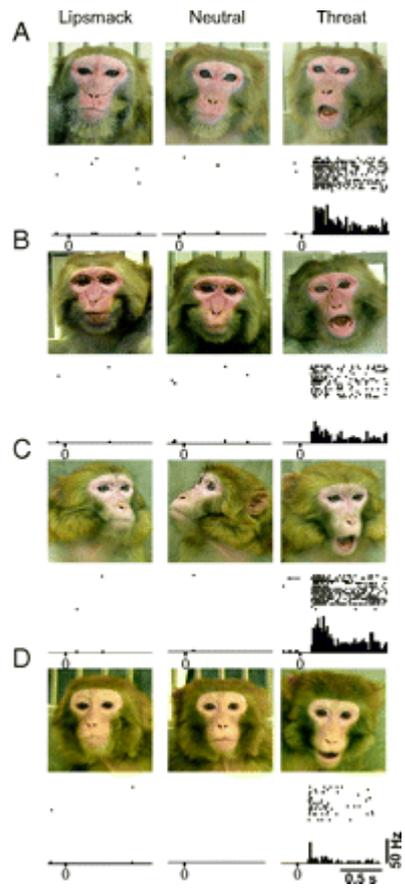
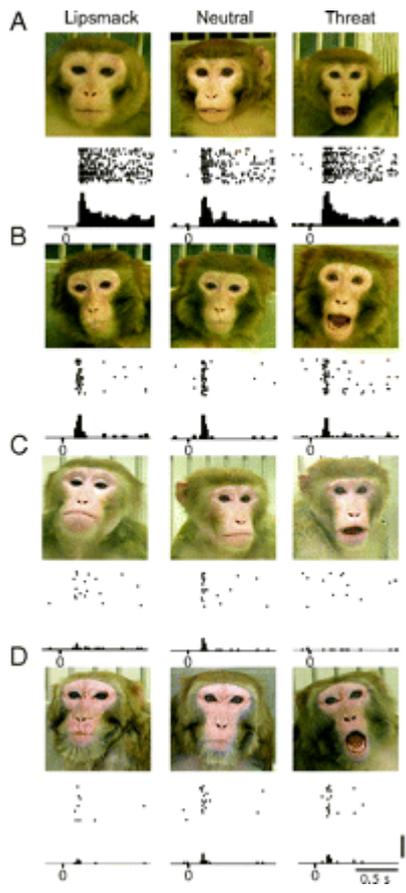




Calder et al. 2001

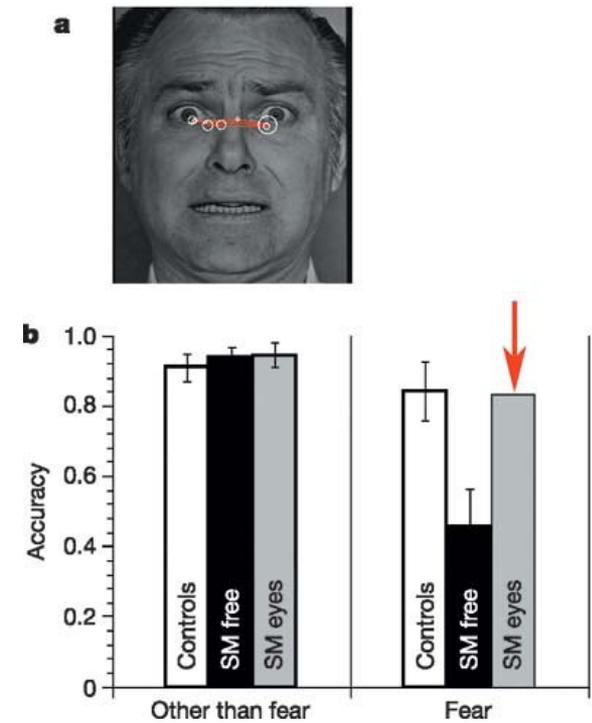
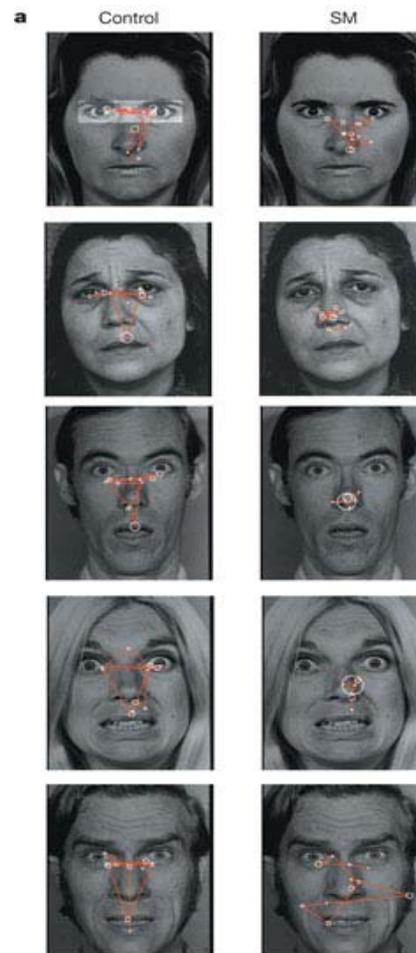
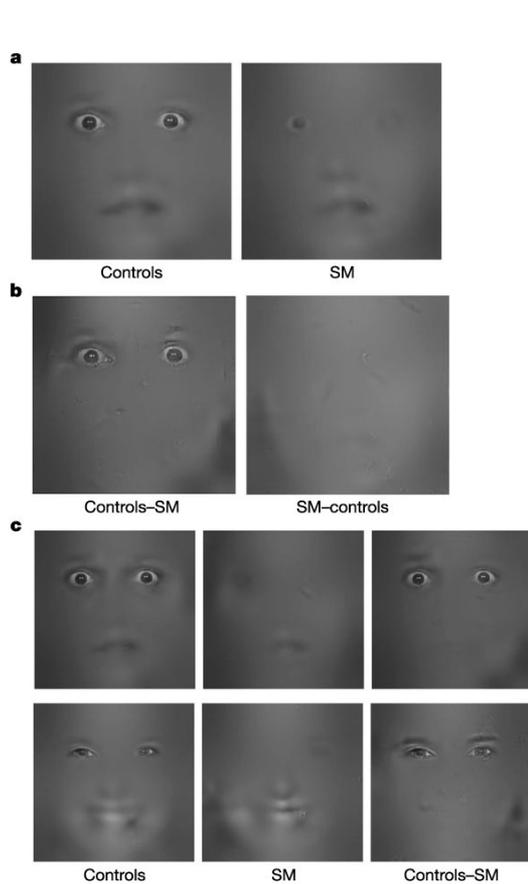


Red – תגובה לפנים מפוחדות (8)
Green – תגובה להתנית פחד (6)

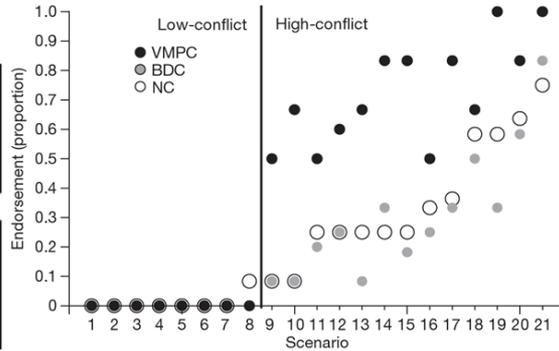
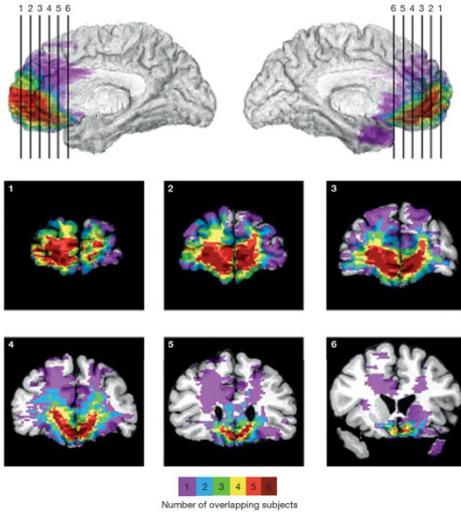


Gothard KM, 2007

Eye-search is critical for identifying emotions



Damage to the prefrontal cortex increases utilitarian moral judgments

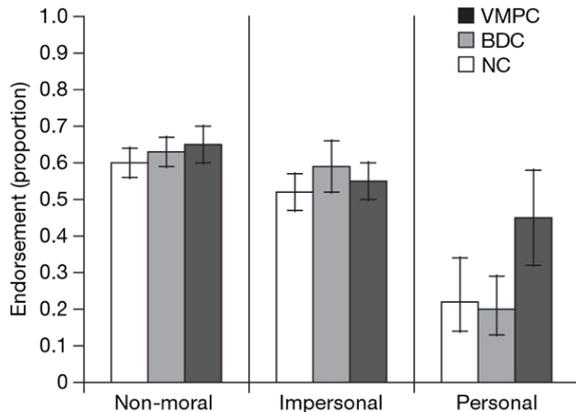


Impersonal

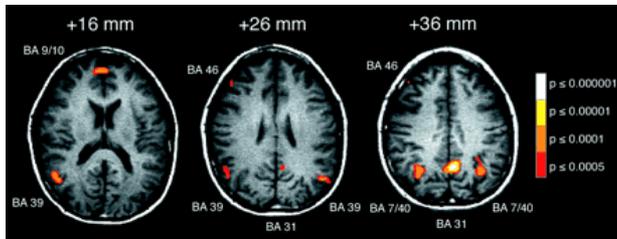
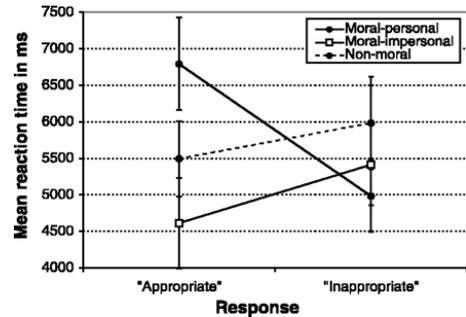
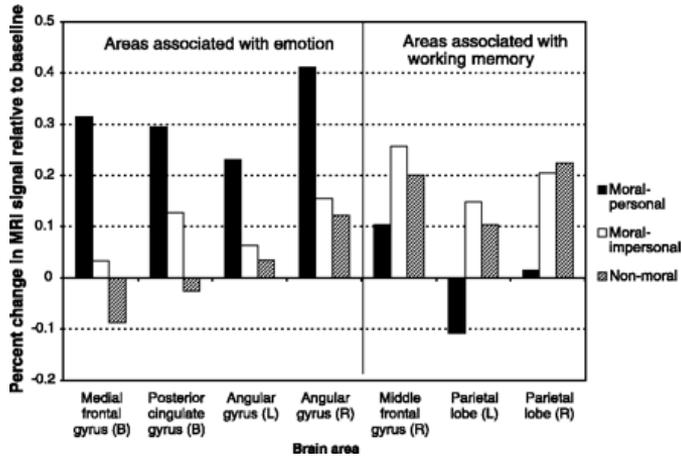
You are at the wheel of a runaway trolley quickly approaching a fork in the tracks. On the tracks extending to the left is a group of five railway workmen. On the tracks extending to the right is a single railway workman. If you do nothing the trolley will proceed to the left, causing the deaths of the five workmen. The only way to avoid the deaths of these workmen is to hit a switch on your dashboard that will cause the trolley to proceed to the right, causing the death of the single workman. Would you hit the switch in order to avoid the deaths of the five workmen?

Personal

A runaway trolley is heading down the tracks toward five workmen who will be killed if the trolley proceeds on its present course. You are on a footbridge over the tracks, in between the approaching trolley and the five workmen. Next to you on this footbridge is a stranger who happens to be very large. The only way to save the lives of the five workmen is to push this stranger off the bridge and onto the tracks below where his large body will stop the trolley. The stranger will die if you do this, but the five workmen will be saved. Would you push the stranger on to the tracks in order to save the five workmen?

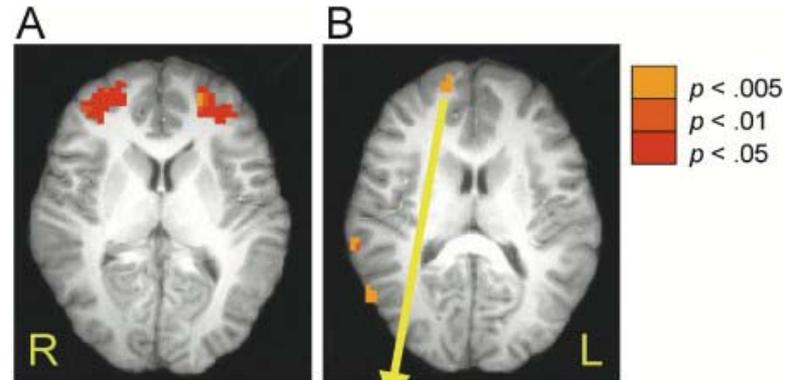
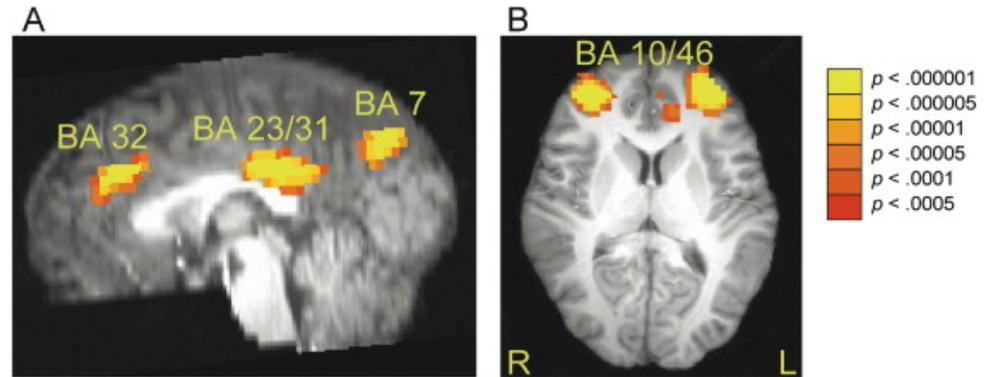


Fighting with emotions



Greene, Science, 2001

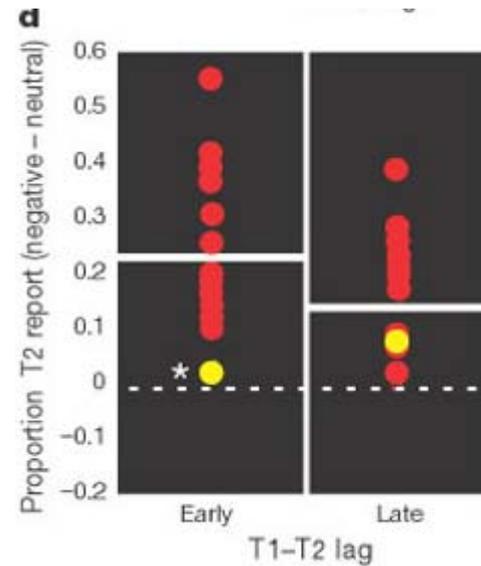
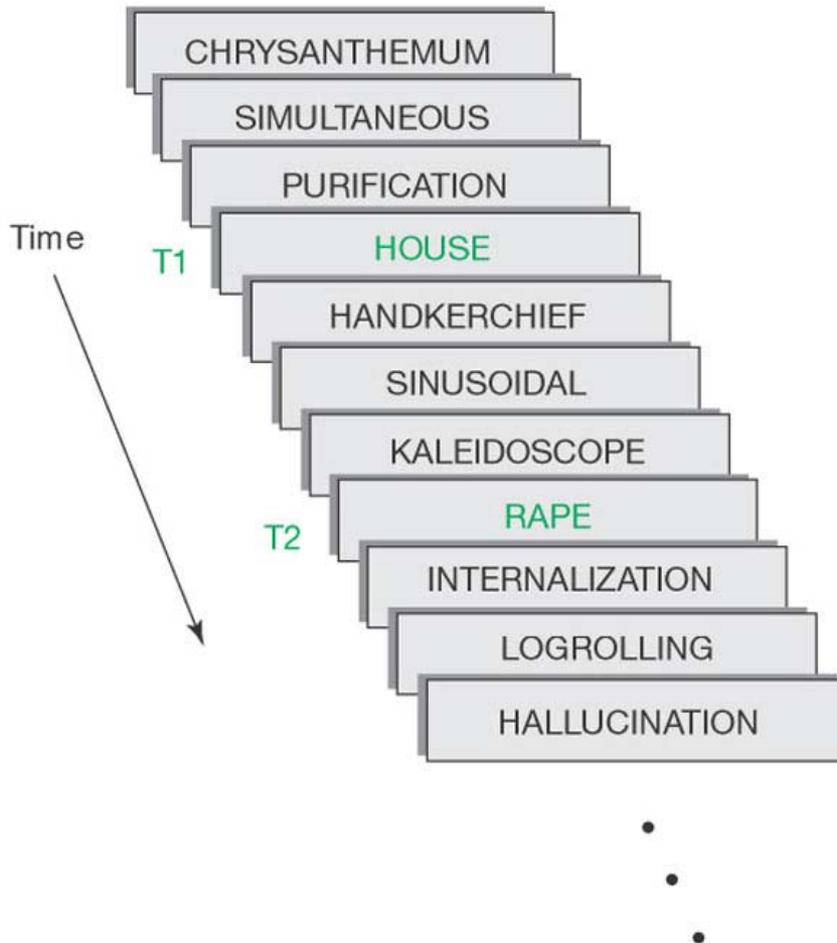
Hard (high-RT) vs. Easier



C Right anterior DLPFC:
Utilitarian vs. non-utilitarian moral judgment

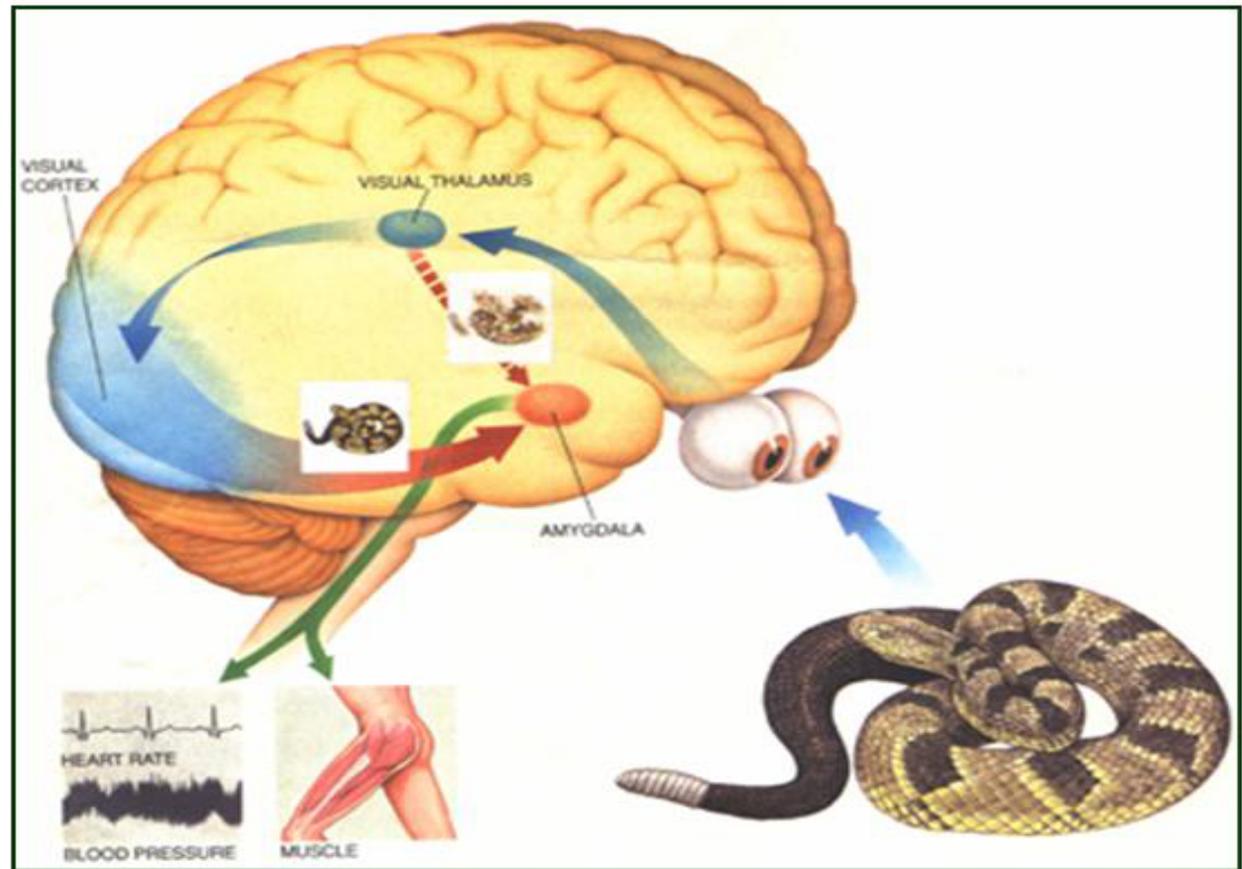
Greene, Neuron, 2004

Emotional affect on “Attentional blink” is reduced with amygdala damage



A conscious pathway

Subconscious pathway and innate fears (loud noises, heights)



LeDoux (1996)