

LeDoux recorded rats with amygdala lesions and found that this prevented fear conditioning in rats.

Whalen et al. (2004) Found a greater response to fearful faces than angry/happy faces in the amygdala. Even when only whites of eyes are primed.

Patient EVR (Damasio et al. 1985) Damage to ventromedial PFC, virtually no emotional reactions (thus emotional detachment), incapable of making decisions but highly intelligent. Suggests moderation of emotion in VMPFC.

Amygdala: Largely related to fear (but not exclusively).

Prefrontal Cortex

Emotion and Brain

Emotion

Emotion is an **evaluative response** which is a negative or positive feeling that typically identified by **physiological arousal, behavioural**

Paul Ekman argues that there are 6 standard emotions: Disgust, Anger, Sadness, Surprise, Happiness, Fear.

Most of the debate within emotion has been about at what point physiological arousal occurs. Does it precede or follow emotional stimuli?

Physiological Responses are regulated by the Autonomic Nervous System. This prepares the body for action. The Sympathetic side prepares for arousal and the Parasympathetic prepares for calming...

Schachter & Singer (1962) Adrenaline Injections Participants were injected with adrenaline or saline (control). They were either informed about the effects, misinformed or were not given any emotion. They then interacted with a stooge in a separate room whilst filling out a questionnaire about happiness/anger who was either **euphoric or angry**. The least likely to be affected by the stooge were the adrenaline informed, as they could explain their emotions as related to the drug. The most likely were the adrenaline uninformed, who had no justification for their emotions. All were always least affected, suggested that cognitive appraisal of emotion is important.

Schachter & Singer: Two Factor Theory On the other hand, it is argued by Schachter and Singer that physiological arousal tells us that we are experiencing some emotion, and that our cognitive label tells us what emotion we are experiencing. Here, perception of a physiological response precedes emotion and is necessary but there is not a different response for different emotions.

James-Lange Theory William James stated "we feel sorry because we cry, angry because we strike, afraid because we tremble" suggesting that we perceive first, then have a physiological response, then experience emotion. **Crucially**, it states that perception of the physiological response is necessary and that we have different responses for different emotions.

Cannon-Bard Theory Counters the James-Lange theory and suggests that physiological responses and emotion are **independent**. So perception of a physiological response is **not necessary** and we do not have different responses for different emotions.

Support: Ax (1953) Had participants take part in an experiment using electric apparatus. In the first condition, they were insulted by a technician (eliciting **anger**). In the second, the apparatus was said to be faulty (eliciting **fear**). These two responses were differentiated by changes in diastolic BP, heart rate, muscle tension, respiratory rate etc. However, this is also compatible with the other theories.

Hohmann (1966) WW2 soldiers suffered lesions to the spinal chord, which caused a loss of sensation below the level of injury. They could not therefore detect emotions. The intensity of these emotions decreased with the height of the injury (towards the neck), supporting the notion that physiological arousal is necessary for emotion.

However, Cannon & Bard argue that the same physiological responses are involved in many emotions (e.g. racing heart is associated with fear, anger and love). The physiological changes are too slow to trigger sudden emotion.