**Perspective:** Models of emotion (Canon-Bard, James-Lange, Schacter-Singer), **binocular rivalry** (amygdala activity to subliminally perceived scary faces), **Amygdala consolidates mem.** **Knowlton**: double dissociation implicit and declarative (Parkinson’s and hippocampus dmg, weather prediction)

**Method**: 31 y/o woman, **SM046**, rates emotional sentences and faces on **scales of valence and arousal**

-Compares to control (N = 24 for faces, N = 18 for sentences)

-SM046 goes through the experiment 3 times

**Scales: valence and arousal**

-Taken from “**affect grid**” -> construct validity and reliability

-Scales go 1-9, >5 = pleasant or aroused, 5 = neutral

Pictures: 39 total

-**6 each** for happiness, surprise, fear, anger, disgust and sadness + 3 neutral. Random order without time limit

-SM046 had no visual impairments and could distinguish faint emotional expressions from neutral faces in all 6 basic emotions

Sentences: 30 total

-5 for each basic emotion

-Describes either **persons or acts** in neutral tone of voice

-Subjects asked how they would feel when experiencing the emotion denoted by the label or experiencing the situation

Labels: words denoting each basic emotion: happy, surprised, afraid, angry, disgusted, and sad

**Results**

**Fig. 1:** ratings of valence and arousal for **facial expressions**

-White: control, Black: SM046

-SM046 rated **valence within 2 standard deviations** from the control mean for all 6 basic emotions

**Fig. 2**: Arousal rating impaired in negative valence emotions

-Figure shows **difference from mean control** arousal rating

-SM046 follows control arousal ratings for most emotions

-But especially for **afraid and angry** and somewhat for disgusted and sad she **rates stimuli at much lower arousal**

-The grey line represents average expected deviation from mean within control group. If **SM046 is significantly different from line, answers can be assumed non-random.**

**Fig. 3**: Ratings of valence and arousal **sentences and labels**

-Black dots: SM046’s results for all three runs of the experiment

-**Severe impairment in ability to recognize arousal in sentences and labels**

-Rated sentences for **fear and anger as relaxing**, typically more than 5 standard deviations below control mean

-**Normal ratings of valence to all emotions**

**Criticism**: Affect grid keep **reliability/validity** when split?

-3 times w/ SM, did she learn (social cues, reactions...)

-Are **sentences read ‘live’** or recorded? Social cues and biases from researcher expectations

**Authors’ conclusions: emotional knowledge acquisition**

-Amygdala dmg -> **unable** to see **arousal** but not valence

-Other study: **no conditioned fear, but understood relation**

-One explanation: SM046 **never acquired** conceptual knowledge concerning arousal of unpleasant emotions

-SM shows **normal skin conductance** to startle

-Similar to **hippocampus**: acquisition not retrieval

-More work to determine if acquisition or retrieval

Examines assessments of emotional **valence** and **arousal** in a patient with **complete bilateral amygdala lesions**

**Hypothesis**

-The brain contains neural **systems specialized to recognize emotional arousal** in negatively valenced stimuli

-The **amygdala** is part of this system

**Emotion**: A set of physiological responses, action tendencies, and subjective feelings that adaptively engage humans and other animals to react to events of biological and/or individual significance.

**Social referencing**: The use of emotions expressed by another individual to guide one’s own behaviour.

Adolphs, Russell & Tranel (1999). A role for the human amygdala in recognizing emotional arousal from unpleasant stimuli