Emotions

Recap and some answers ...

- Innate or learned?
  - Fear conditioning
- Voluntary or Involuntary?
  - James Lange Theory
  - There are fast and slow routes
- Emotional expression vs. Emotional Experience
  - Hypothalamus (sham rage)
  - Amygdala (stimulus studies)
- Do animals have emotions?
  - Fear aggression
  - Neural systems: Limbic system, amygdala and prefrontal cortex
- Adaptive behavior or Communications

Facial Expressions

- Emotions have social values. To Communicate
  - Emotional expression vs. emotional experiences
    - Do animals express or experience emotions? What about robots?
  - Internal state: for example Depression, sadness, health
  - Immediate past experiences such as fear
  - Immediate future Intents like anger
  - Context information expressed by comedians, emoticons
- How much can one trust an emotional expression
  - Innate (Involuntary) vs Learned (Voluntary)

Darwin’s Theory

- The expression of emotion in man and animals (1872)
- Same basic features Such as aggression (teeth, snarl)
Human facial emotions

- In different cultures (islands): different languages, have the same emotional expressions, and the same understanding of non-verbal emotion sounds
- Blind children produce the same expressions as normal children
- Other means of expressing emotions
  - Voice, tone, body posture

Innate emotional Expressions

- A month old can make happy, sad, surprise faces
- It only works with moms, not strangers or dads
- Works less with other facial expressions
- At age 1 Emotional expressions are more intense if in a social group

Facial Expressions: Physiological Basis

- True and fake facial expressions: Individual facial muscles
  - Duchenne- Electrical stimulation of Facial muscles (Fig. 10.13)
- Acting: Stanislavski system and method acting
  - Decompose the script and internalize the characters emotion

Basic Emotional Expressions

- Six basic emotional expressions, each is produced by specific muscle contractions
- FACS (Facial Action Coding System)
  - Way to measure elementary muscle contractions that make up emotional expression
  - Surprise, anger, sadness, disgust, fear, happiness
- The production of the correct FACS for an expression sometimes elicit emotion in the subject
  - Botox may blunt the experience
  - Feedback Theory- facial movement has influence on emotional experience

Neural Bases: Facial Paresis

- Right hemisphere Damage (motor cortex, facial nerve) \(\rightarrow\) Volitional Facial Paresis
- Left hemisphere Damage (insular cortex, thalamus) \(\rightarrow\) Emotional Facial Paresis
  - See figure 10.14
- Two neural systems for voluntary (fake) and spontaneous (Real) facial expressions

Asymmetry of the Face

- Most emotional expressions start on the left side of the face
- Lateralization of Emotions
  - Hemispheric specialization of facial expression recognition
    - Left hemisphere: words, speech, meaning
    - Right hemisphere: facial expressions, tone of voice (fig 10.11)
  - Sex difference in emotion processing

Amygdala Damage in Humans
- Are there specialized brain areas for specific emotional expression
  - Amygdala: specialized for fear and danger
    - Patients with this damage can depict many emotional expression, but fear
  - Blind patients can recognize facial expression → subcortical route for emotional visual info.
  - Expressing emotions vs recognizing emotions
    - Most amygdala patients can express emotions, but cannot recognize them

**Insulator Cortex: disgust**

- Insulator cortex contains primary gustatory cortex
- Activated by sight and experience of disgust
- Disgust is a protection signal different in any person or species

**Summary**

- Emotions are a fast and simple way of communicating a general state or general intentions
  - Face, voice and body posture
- WhichExpressions
  - 1872 Darwin: there is something innate about facial expressions
  - FACS and six emotions
  - Voluntary vs involuntary expressions
- Hemispheric Differences
  - Right vs left activation
  - The expression of emotion is not symmetric on human faces
  - The productions of emotion is not symmetric in monkeys
  - Volitional facial paresis vs emotional facial paresis
  - Some emotions activate specific brain areas
- Can robots have emotions?