Emotions Part II

10/28/08

Recap

- Innate or learned?
  - Fear condition
- Voluntary or involuntary (conscious/unconscious)
  - James-Lange theory
  - Fast/slow routes
- Emotional expression vs. Emotional experience
  - Hypothalamus (sham rage)
  - Amygdala (stimulation studies)
- Do animals have emotions?
- Fear, aggression
  - Limbic system, Amygdala, and prefrontal cortex
- Adaptive behavior or communication?

Facial Expressions

- Emotions have social values: communicate
  - Emotional expression vs. emotional experience (do animals express emotions? Do they experience emotions? what about a robot?)
  - Internal state: e.g. depression, sad (health)
  - Immediate past experiences: e.g. fear
  - Immediate future intents: e.g. anger
  - Context information: e.g. comedians, emotions
- How much can one trust an emotional expression?
  - Is it Innate (involuntary) or learned (voluntary)?

Darwin's theory (figure 10.8)

- The expression of emotion in man and animals (1872)
  - Same basic features(e.g. aggression? teeth, snarl
  - human (facial) emotional expression have evolved from that of animals
  - In different cultures (islands) they have different languages, but use the same emotional expressions (innate component).
  - Blind children have same expressions as normal children (innate component).
  - Other means of expressing emotions: voice and body posture
- Some emotional expressions are innate: happy, sad, surprise

Facial expressions: physiological basis

- True and "fake" expressions: individual facial muscles
- Acting: Stanislavski Method

Basic emotional expressions

- 6 basic emotions: each produced by specific muscles (surprise, anger, sadness, disgust, fear and happiness).
  - Combinations: FACS (facial action coding system)
  - You can combine expressions to get others

Neural basis: facial paresis (figure 10.3)

- Emotional facial paresis: caused by left-hemisphere lesion. Only the left side of his face responds.
- Volitional facial paresis: caused by right-hemisphere lesion (motor cortex of facial nerve). Only the right side of her face responds voluntarily. Can express genuine expressions involuntarily.

  Two different neural systems for voluntary (fake) and spontaneous (real) expressions

Asymmetry of face (figure 10.4)

- Usually the left side of the face is more expressive than the right
  - right hemisphere dominance for facial expressions
  - Most emotional expression start of the left side of the face (in monkeys).

Laterization of emotions (figure 10.9)

- Hemisphere specialization of facial expression recognition:
  - Left hemisphere: words, speech (meaning)
  - Right hemisphere: facial expressions, tone of voice (prosody)

Emotional laterization (figure 10.10)

- Recognition of emotion is impaired in patient with somatosensory cortex damage
  - Recognition of emotion may involve "internal stimulation" of emotional expression.

Amygdala damage in human (figure 10.15)

- Expressing emotions vs. recognizing emotions
- Some amygdale patients can express emotions, but can't recognize them. Are there specialized brain areas for specific emotional expressions?
  - Sub-cortical route for emotional visual information: blind patients can recognize facial expressions

Insular cortex: Disgust (figure 10.11)

- Insular cortex contains the primary gustatory cortex
- Activated by sight and experience of disgust
  - Disgust: a protection signal (personal and species)

Emotional expression summary

- Emotions: fast and simple way of communicating a general state and general intentions (face, body posture, voice)
- Which expressions
  - 1872 Darwin theories something innate about facial expressions
  - Expressions are useful means of expression
  - P. Ekman: FACS and the 6 emotions. Voluntary vs. involuntary expressions
- Hemispheric differences
  - Right vs. Left activation
  - The expression of emotion is not symmetric on human faces
  - The production of emotion is not symmetric on monkeys
  - Volitional facial paresis (primary motor cortex) vs. emotional facial paresis (frontal cortex)
  - Some emotions activate specific brain areas (e.g. fear and disgust)