

Emotion—What is it?

Jay Gould 4/12/04

➤ Defining Emotion

- Although all of us have a fair idea as to what emotion is, the *scientific study of emotion* is hampered by the lack of good operational definitions (but see later).
- For one thing, the same emotional states are elicited by a variety of environmental situations, and the same situation may elicit different emotional states depending on the other variables.
- Matters are further complicated by the fact that different emotions interact not only with each other, but also with quite different motivational influences, e.g., hunger and sexual desire.
- In addition, the same or similar responses may be components of what appear to be different emotional states.
 - Example: both fear and anger, e.g., involve similar changes in respiration and heart rate.
- Furthermore, there are considerable individual variations in response components.
- Finally, responses, which are components of emotional states, also occur in non-emotional situations.
 - Examples: increased heart rate and blood pressure of anger also occurs when *exercising*; extreme facial pallor characteristic of fear also occurs when a person stands up suddenly after bending down for a period of time.

➤ Two Major Aspects of Emotion

- Affect, or subjective experience, i.e., how one feels in a particular emotional state, e.g., happy, sad, angry or fearful
- Behavior, i.e., how one acts in a particular emotional state; which includes:
 - Skeletal muscular activity, e.g., laughing, attacking, cringing, running away, or expressive changes in facial muscles and posture (body language)
 - Visceral activity of the autonomic nervous system and endocrine system, e.g., erection of body hair, flushing or paling of the facial skin, sweating, increased heart rate, blood pressure, and respiration, and increased adrenalin secretion
 - Thus the two aspects of emotion which we have noted, affect and behavior, can also be thought of as three or four distinct aspects:
 - Experiential (or affect)
 - Behavioral (or skeletal-motor)
 - Visceral (or physiological)
 - ✓ Autonomic
 - ✓ Hormonal
 - Because subjective experience cannot be studied directly, except introspectively by the individual himself or herself, the study of emotion has involved various behavioral measures.
 - In humans these includes verbal reports of subjective experience, as well as other skeletal-motor responses, and the physiological activity of the autonomic nervous system and endocrine system.

➤ **Properties and Functions of Emotion**

- Definition of Emotion

- Joseph LeDoux has said that: “*Emotion* can be defined as the *process* by which the brain determines or computes the *value of a stimulus*.”
- *Emotional actions* occur when emotions *motivate* us to do things.
- *Feeling* emerges as we become *aware* that our brain has determined that something *important* is present and we are *reacting* to it.” (Sentence order and italicizes are mine)

- Close Relationship Between Emotion and Motivation
 - Positive, or pleasant, emotions are associated with the satisfaction or expected satisfaction of the organism’s needs (including, e.g., the hunger, thirst, and investigatory drives).
 - Negative, or unpleasant, emotions are associated with the non-satisfaction or expected non-satisfaction of the organism’s needs (including, e.g., the sexual and defensive drives).
 - Thus emotions are a form of motivated behavior and experience, with rather general antecedent conditions.

- Functions of Emotion
 - Emotions can serve as feedback for motivational systems, and thus they are involved in learning:
 - Positive/pleasant emotions reinforce antecedent behaviors, increasing their probability.
 - Negative/unpleasant emotions punish antecedent behaviors, decreasing their probability.
 - Emotions are themselves, motivating, e.g., anger, fear or anxiety, and the desire to be happy.
 - Emotion is typically associated with heightened arousal, and thus activity of the autonomic nervous system

(although this activity may actually be lowered, as in the case of depression); and also hormonal responses of the adrenal medulla and adrenal cortex endocrine glands.

- These ordinarily help the organism to deal with stress by enhancing attention, perception, memory, decision-making, and metabolism; hence emotional arousal organizes and coordinates activity of the brain, and thereby also the body.

- Moderate emotional arousal facilitates *memory formation*; whereas strong/stressful arousal leads to *impaired* explicit, contextual memory formation (the stress hormone *cortisol* disrupts the *hippocampus*, and if long-term can cause degeneration), as well as *impaired decision-making* (the *prefrontal cortex* is disrupted), while enhancing *implicit emotional memory* (the *amygdala* is charged up).

- Emotional behaviors are complex combinations and sequences of somewhat independent behavioral components, which might have different functions.
- Darwin (1872), e.g., noted that emotional behaviors often represent anticipatory/preparatory adjustments of the organisms, such as baring the teeth in an anger or fear eliciting situation as preparation for biting.
 - Thus Darwin proposed the concept of serviceable associated habits.
 - That is, useful/functional behaviors are often associated with emotions.
 - As already noted, in addition to skeletal-motor behaviors, there are also physiological preparatory adjustments associated with heightened arousal.
- Darwin also noted that emotional behaviors often have a communicative function, which is also useful, indicating affective state and behavioral probability to other organisms; e.g., clenching and waving one's fist.
 - Related to this communicative function is Darwin's concept of antithesis, i.e., emotional behaviors associated with opposite intentions are usually opposite in appearance.
 - Example: consider the differences in body posture and facial expression of a dog that is angry and threatening attack, versus a dog that is cowering in fear.