The Trilogy of Mind
Immanuel Kant (1791); Hilgard (1980)

“There are three absolutely irreducible faculties of mind: knowledge, feeling, and desire.”

• Cognition
  • Knowledge and Beliefs
• Emotion
  • Affect, Moods, Feelings
• Motivation
  • Drives, Needs, Desires, Goals, Purposes
The Domain of Emotion
Niedenthal, Krauth-Gruber, & Ric (2006); Oatley, Keltner, & Jenkins (2006)

• “Brief, adaptive responses, involving physiological and cognitive reactions to objects, people, or situations.” [?]
• An internal mental state consisting of subjective feelings of pleasantness and unpleasantness.
• The Affective Lexicon
  – Feeling
  – Mood
  – Emotion
Dimensions of Feeling
Wundt (1899)

- Unpleasantness
- Pleasantness
- Strain
- Calm
- Excitement
- Relaxation
The Affect Circumplex
Russell (1980)

Figure 2. Direct circular scaling coordinates for 28 affect words.
The Affect Circumplex
Watson & Tellegen (1985)

Figure 1. The two-factor structure of affect.
Dimensions of Feeling
Bipolarity vs. Independence

Russell (1980)

Watson & Tellegen (1985)
The Language of Emotion
Shaver et al. (1987)

• Love
  – Liking, Passion
• Happiness
  – Joy, Ecstasy
• Anger
  – Frustration, Rage, Resentment, Disgust, Envy
• Sadness
  – Agony, Grief, Disappointment, Guilt, Loneliness, Pity
• Fear
  • Alarm, Fright, Anxiety
• Surprise (A “Pre-Emotion”)
Multiple-Systems View of Emotion

Lang (1968)

- Emotional State
- Verbal-Cognitive
- Overt Motor
- Covert Physiological
The James-Lange Theory of Emotion
James (1884); Lange (1885)

• External Event Elicits Bodily Response
  – James: Whole Body
  – Lange: Visceral

• Perception of Efferent Activity Experienced as Emotion
Critique of the James-Lange Theory
Cannon (1915, 1927, 1929); Bard (1934)

- Emotion is Preserved when Spinal Cord is Severed
- No Differential Pattern of Response
- Nonspecific Perception of Visceral Response
- Autonomic Responses Too Slow
- Manipulation of Autonomic Responses Has No Effect on Emotion
General Arousal Theory
Duffy (1934); Lindsley (1951); Woodworth & Schlossberg (1958)

• Physiological Arousal
  – Single, Undifferentiated State

• Different Emotions Vary Only in Intensity
Cognitive-Evaluation Theory of Emotion
Schachter & Singer (1962)

• Events Elicits Emotional Arousal
  – Undifferentiated
  – Unexplained

• Arousal Interpreted by Actor
  – Shaped by Current Situational Context

‘[P]recisely the same state of physiological arousal could be labeled “joy” or “fury” or “jealousy” or any of a great diversity of emotional labels depending on the cognitive aspects of the situation.’
Emotional State
Schachter & Singer (1962)

Informed
Ignorant

Condition
Euphoria
Anger

Positive Mood (0-4 Scale)
Cognitive Theory of Arousal
Mandler (1975, 1984)

- Arousal as Response to Discrepancy
  - Expectations
  - Intentions
  - Habits
- Arousal Elicits Attention
- Emotion Determined by Cognitive Evaluation
  - Source of Discrepancy
  - Context of Arousal
Cognitive-Appraisal Theory of Emotion
Smith & Ellsworth (1985), after Lazarus (1968)

- Pleasantness
- Anticipated Effort
- Certainty
- Attentional Activity
  - Situational Control
  - Self-Other
## Distinguishing Happiness from Pride

Smith & Ellsworth (1985)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Happiness</th>
<th>Pride</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleasantness</td>
<td>Pleasant</td>
<td>Pleasant</td>
</tr>
<tr>
<td>Anticipated Effort</td>
<td>Little Effort</td>
<td>Little Effort</td>
</tr>
<tr>
<td>Certainty</td>
<td>High Certainty</td>
<td>High Certainty</td>
</tr>
<tr>
<td>Attentional Activity</td>
<td>Much Activity</td>
<td>Much Activity</td>
</tr>
<tr>
<td>Attributional Activity</td>
<td><strong>Human Control and Personal Responsibility Not Necessary</strong></td>
<td><strong>Human Control Necessary (Self or Other)</strong></td>
</tr>
<tr>
<td>Situational Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
James-Lange Redux: The Facial-Feedback Hypothesis
Tomkins (1962), after Schlossberg (1952)

• Dimensions of Facial Expression
  – Pleasantness vs. Unpleasantness
  – Rejection vs. Attention
  – Activation vs. Tension Relaxation

• Primary Emotions
  – Innate Neural Programs
    • Automatic Activation ➔ Facial Display
    • Communicates Emotion to Others
    • Feedback Generates Emotional Experience
Facial Expressions of Emotion

Darwin, *The Expression of the Emotions in Men and Animals* (1872)
Ekman & Friesen (1975)

- Verbal vs. Nonverbal Communication

- Expression *Follows* Emotion
Basic Emotions
Ekman & Friesen (1975)

Happiness
Sadness
Fear
Anger
Surprise
Disgust

- Noncognitive Motor Signs
  - Prewired, Automatic
- Universal
  - Across Cultures
  - Across Species
- Blends of Emotion
Perceptual-Motor Theory of Emotion

• Expressive-Motor Processing
  – Subjective Feelings
  – Expressive Reactions

• Schematic/Perceptual Memory
  – Records Emotional Episodes
  – Automatic Activation
  – Rapid Evaluation

• Conceptual/Abstract Memory
  – Declarative Knowledge About Emotion
  – Nonverbal Codes for Recognition, Enactment
Hypothalamic Theory of Emotion
Cannon (1915, 1927, 1929); Bard (1928)

- Emotional State
  - Generated by Hypothalamus
- Emotional Behavior
  - Discharges to Brainstem
- Emotional Experience
  - Discharges to Cortex
Papez’ Circuit
Papez (1937)
The Limbic System and the Visceral Brain
MacLean (1952; 1970, 1990)

- Neocortex
  - “New Brain”

- Limbic System
  - “Old Mammalian” Brain
    - Amygdala
    - Hypothalamus
    - Hippocampus

- R-Complex
  - “Reptilian Brain”
    - Brain Stem
    - Cerebellum
Brain Systems in Fear
LeDoux (1995)

- Emotional Event
  - Thalamus
    - Amygdala
      - Behavioral Response
      - Physiological Response
      - Subjective Experience

The Modularity of Emotion
Affective Neuroscience

• Fear (and Other Negative Affect?)
  – Amygdala
• Emotion Regulation
  – Orbitofrontal Cortex
• Discrepancies
  – Anterior Cingulate Gyrus
• Positive Affect
  – Nucleus Accumbens
• Disgust
  – Insula
The Embodied Mind
Niedenthal (2007); Niedenthal et al. (2005); Proffitt (2006)

• Mind Not Separate from the Body
  – Descartes Was Wrong
    • Mental Architecture Not “Amodal”

• Mental Representations and Processes Are Grounded in their Physical Context

• Embodied Emotion
  – Emotional States Derived from Bodily States
  – Emotional States Expressed in Bodily States
Emotion and Cognition
Eich et al. (2000); Niedenthal & Kitayama (1994)

- Cognition Affects Emotion
  - Self-Regulation of Pain, Anxiety in Surgery
  - “Depressogenic” Schemata in Depression

- Emotion Affects Cognition
  - Perception (“Rose-Colored Glasses”)
  - Memory: Mood-Congruent, Mood-Dependent
  - Judgment
  - Performance
  - Risk-Taking