CHAPTER TEN

The Emotional Approach: Mind as Emotion
What is Emotion?

- *Emotion* – a relatively brief episode of coordinated brain, autonomic and behavioral changes that facilitate a response to an external or internal event of significance for the organism.

- *Feelings* – the subjective experience of emotions.

- *Moods* – a diffuse affective state that is often of lower intensity than emotion but considerably longer in duration.
A basic emotion is one that is believed to be mostly innate and thus in humans ought be be universal or found in all cultures (Plutchik & Kellerman, 1980).

Ekman and Friesen (1971) had New Guinea tribe members label facial expressions of Western faces. They could successfully label happy, sad, fearful, angry, surprise and disgust.

There is debate about these though. Pride? Different types of disgust and different varieties of happiness like joy, amuesment, love, and interest.
Basic Facial Expressions

Happy
Sad
Fearful

Angry
Surprised
Disgusted
Theories of Emotion

- **James-Lange theory.** Event produces arousal. The physiological changes are then interpreted to produce the emotion.

- **Cannon-Bard theory.** The event itself can trigger the emotion and arousal, but the arousal does not have to come first.

- **Emergence-synthesis theory.** Some emotions do not require interpretation while others do. So both are allowable.
The Role of Appraisal

- Classic study by Schachter-Singer in 1962.
- Participants injected with adrenalin, told it was a vitamin mixture.
- Put into a waiting room with a happy or obnoxious confederate.
- Those in the happy condition interpreted their arousal as happiness. Those in the obnoxious condition reported anger and frustration.
- The environment influences how we interpret our bodily states.
Hot and Cold: Emotion-Cognition Interaction

- Traditional view of thoughts as “cool” and emotions as “hot” suggests that these are separate brain pathways and that they do not interact.
- This is definitely not the case. Thought and emotion co-occur most of the time and are interconnected at many different levels of organization (Phelps, 2006).
- Only in psychological disorders do we see “Spock-like” characters who are emotionless or people who are purely emotional.
Emotion and Perception/Attention

- Attention acts like a filter, focusing on what’s important and blocking out the rest.
- Emotions steer attention toward items in the visual field that are important for survival.
- In the *threat superiority effect*, angry faces are detected more easily among neutral faces than happy faces or sad ones among neutral faces.
The Threat-Superiority Effect

Find the angry face.

Find the happy face.
Emotion and Memory

- **Flashbulb memory** is better recall for personal events during significant or emergency situations. What were you doing on 9/11?
- This is a type of *autobiographical memory* since it is for events, not facts.
- Negative stimuli are remembered better than positive or neutral stimuli and more arousing stimuli, whether they are positive or negative, are remembered better (Ochsner, 2000).
- Three reasons for this effect: greater attention, greater distinctiveness, or thinking about them more (Fox, 2008).
Emotion, Mood and Memory

- **Mood congruent memory.** We remember more stimuli if those stimuli match a mood we were in while learning them. Example: If in a bad mood while studying a list, you will be more likely to remember “death” than “flower”, no matter what mood you are in when trying to recall.

- **Mood dependent memory.** Recall is better when the mood at recall matches that during learning. If you are in a bad mood while studying and in a bad mood while recalling, you will remember more compared to if the moods at each time are different.
Emotion and Decision Making

- Emotional decision making is intuitive, fast, and can lead directly to a decision. However, these decisions are more prone to error due to inaccurate or irrelevant information. Best used for unimportant situations. Pizza or Chinese?

- Rational decision making is calculated, slower and may lead to a delayed decision. However it is more likely to be correct. Best used for important situations. Should I go to law school?
Emotion and Decision Making

- Emotions don’t always “get in the way” of decision making. In some cases they can help (Damasio, 1999).

- The Iowa Gambling Task. The first two decks of cards are risky and produce greater losses. The last two are safer and produce greater gains.

- Normal patients eventually stop picking from the first two. Patients with damage to vmPFC do not.
Emotions and Neuroscience

- The amygdala, part of the limbic system, is responsible for classical conditioning of a fear response (LeDoux, 1996).
- The “low road” to the amygdala mediates fast emergency responses.
- The “high road” mediates more thoughtful responses.
- It also seems to improve memory for arousing stimuli by sending inputs to the hippocampus.
Fear Response/ Sympathetic Arousal

Amygdala

Thalamus

Fearful Stimulus

The low road to the amygdala

Cortex

Fear Suppression

Amygdala

Thalamus

Fearful Stimulus

The high road to the amygdala

Decision Making/ Behavior Selection
Electrical activity between neurons is believed to be the basis of information processing and cognition.

Synaptic action seems more closely linked with emotion (Panksepp, 1993).

Glutamate: anger and fear, GABA: anxiety, norepinephrine: fight or flight response, serotonin: depression, dopamine: happiness but also schizophrenia.

Hormones are also linked more to emotions. Testosterone: aggression, estrogen: mood and sexual behavior, oxytocin: maternal bonding.
Emotions, Evolution and Psychological Disorders

- Emotions evolved to keep us alive, facilitate communication and to help us think and problem solve. However, when these mechanisms malfunction, the result can be a psychological disorder.

- Disgust. Keeps us from getting sick or infected. Obsessive-compulsive disorder (OCD).

- Fear. Helps us to avoid dangerous situations. Anxiety disorders like phobias, panic attack and post-traumatic stress disorder (PTSD).
Emotions, Evolution and Psychological Disorders

- Anger. Helps to confront and deal with threats. Excessive aggression can lead to criminal behavior.
- Sadness. May help us think carefully about and focus on a problem, the *analytical rumination hypothesis*.
- Happiness. Reinforces adaptive responses such as feeding and mating. The *feel-good, do-good phenomenon*. Bipolar disorder.
Emotions and Artificial Intelligence

- Affective computing algorithms are being programmed into computers to facilitate human-machine interaction (Picard, 1997).
- Involves both emotional perception but also emotional expression.
- Computers can recognize facial expressions and let you know when it is a good time to take a break from working.
Emotions and Artificial Intelligence

- One program analyzes speech and is able to classify five emotions with about 70% accuracy, equivalent to human level performance (Petrushin, 2000).
- The FaceSense program at M.I.T. can label facial expressions and head gestures from videos.
- The CogAff architecture is an attempt to get machines to respond emotionally the same way people do.
The CogAff Architecture
A cute robot designed to mimic the interaction between an infant and a caregiver.

Kismet can recognize emotions using visual and auditory sensors. It can also move its head and eyes to control what it pays attention to.

It is capable of displaying several different emotions based on movements of its eyes, ears, etc.
The Kismet Project

- Kismet is given emotional drives that affect its behavior. When it is “lonely” it seeks out stimulation by smiling and looking at a person. When it is “tired”, it seeks to reduce stimulation by exhibiting a fearful face and looking away.

- These responses control how we treat it. If it looks at us and smiles we are driven to play with or give it more attention. If it looks away or has a fearful face, we back off and give it more space.