Emotion

What are emotions?

- Emotions as the source of *adaptive* but *conflicting* goals.
  - Fear: goal = safety.
  - Anger: goal = respect.
  - Love (toward mates and children): goal = reproduction.
  - etc.

Concomittants of emotion:

- Cognitive & behavioral goals
- Attention.
  - Samuel Johnson: “Depend upon it, sir, when a man knows he is to be hanged in a fortnight, it concentrates his mind wonderfully.”
- Physiology: "fight or flight"
- Facial expressions

The Limbic System

Hypothalamus

Hippocampus

Amygdala

Pituitary gland
The Limbic System, cont.

- Hypothalamus
- Hippocampus
- Amygdala
- “Old cortex”: cingulate cortex, parahippocampal gyrus
- Phylogenetically old: For “The Four F’s”
- **BUT** highly interconnected with frontal lobes (seat of reason)

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Darwin’s First Principle: Serviceable Habits

Darwin’s Second Principle: Antithesis
Darwin’s Third Principle: Direct action of the nervous system

- Why a child jumps for joy, the damned are said to gnash their teeth, a flogged sailor bites a bullet, a music-lover shivers, and "a vulgar man scratches his head when perplexed in mind; ... as if he experienced a slightly uncomfortable bodily sensation, namely, the itching of this head, to which he is particularly liable, and which he thus relieves."

Darwin's Theory Today

- Some problems with Darwin’s theory:
  - No adaptive function to emotional expressions
    - (weapon against creationists)
  - Lamarckism

A modern interpretation of Darwin's 3 principles:

- 1. Serviceable habits = signals (threats, appeasement, offers of aid)
- 2. Antithesis = maximally nonconfusible signals.
- 3. Direct action of the nervous system = fight or flight + guarantors against bluff-calling.

Universality of Facial Expressions of Emotion

- Cultural conditioning theory
  - (opposite of Darwin)
- Paul Ekman in New Guinea. Tested Darwin’s theory:
  - Universality of production and recognition of facial expressions.
“Your friend has come and you are happy”

“Your child has died”

“You are angry & about to fight”

“You see a dead pig that has been lying there for a long time”
Basic Emotions

Some other universal emotional expressions:

- greeting (eyebrow flash)
- flirt
- stare
- play & laughter
More evidence that emotional expressions are innate:
- homologues in other animals
More evidence that emotional expressions are innate:
- homologues in other animals
- appearance in blind and deaf children

An example: Fear.
- Little Albert and the Pavlovian conditioning theory.
- Problems for the conditioning theory:
  - 1. Preparedness: monkeys can easily learn to fear snakes, but not flowers.
  - 2. Most phobics never experienced a conditioning event (e.g., snakes)
  - 3. Universality of fear stimuli.

Stimuli universally feared by infants:
- Strangers
- Separation
Are any stimuli universally feared, by children and even by adults?
Stimuli universally feared by children (& many adults):

- Snakes
- Spiders
- Heights
- Storms
- Large carnivores
- Darkness
- Blood
- Strangers
- Confinement
- Deep water
- Social scrutiny
- Leaving home alone.

Dangerous but unfeared stimuli:

- Guns
- Fast driving
- Driving without seatbelts
- Bicycling without helmets
- Flammable liquids
- Hairdryers near bathtubs
- Loose carpets on stairways

Mastering fear:
Mastering fear:

- Flooding (real) and implosion (imagery)
- Controlled exposure (a kind of classical conditioning) or desensitization (imagery)
- Social observation.

A second example: Disgust

Great green gobs of greasy grimy gopher guts,
Mutilated monkey meat,
Concentrated chicken feet.
Jars and jars of petrified porpoise pus,
And me without my spoon!
(French fried eyeballs,
Little birdies' dirty feet.
Chopped up baby parakeet.
Perforated ponies' feet. ...)

Apparent Irrationality of Disgust

Why not eat insects, spiders, worms, toads, maggots, caterpillars, grubs?
- Carry germs? Sterilized cockroach experiment.
- Disease?
- Taste bad?

"none distasteful, a few quite palatable, notably the giant waterbug. For the most part they were insipid, with a faint vegetable flavour, but would not anyone tasting bread, for instance, for the first time, wonder why we eat such a flavourless food? A toasted dungbeetle or soft-bodied spider has a nice crisp exterior and soft interior of souffle consistency which is by no means unpleasant. Salt is usually added, sometimes chili or the leaves of scented herbs, and sometimes they are eaten with rice or added to sauces or curry. Flavour is exceptionally hard to define, but lettuce would, I think, best describe the taste of termites, cicadas, and crickets; lettuce and raw potato that of the giant Nephila spider, and concentrated Gorgonzola cheese that of the giant waterbug (Lethocerus indicus). I suffered no ill effects from the eating of these insects."
Components of the Disgust Reaction (Paul Rozin)

- Animal parts & products as triggers. (cf. plants, inedibles).
- All animal parts & products except a few.
- Fear of incorporating object into body: eating, smelling, touching
- Facial expression.
- Contamination by contact
- Resemblance.
  - (cf. Sympathetic magic or “voodoo”)

Other triggers: sex with inappropriate partners; body violations.

How Does Disgust Develop?

- Learning what is disgusting versus Learning what is not disgusting (cf. fear)
- Critical period:
  - Below 2 yrs, put anything in mouth.
  - Above 2 years: tastes spontaneously shrink. Eat only what was eaten in first 2 years.
  - Sometimes expand to a few new foods.

What is Disgust for?

- "Omnivore's dilemma."
- Disgust as caution for untested animal foods
- Contamination thoughts as an adaptation to the multiplication of microorganisms.
- Marvin Harris:
  - Ecological reasons for food taboos (cows, pork)
  - Optimal foraging theory and preference for large over small animals.
### What good is feeling bad?

- The adaptive value of physical pain.
- The adaptive value of *moderate* anxiety (not too high, not too low).

### Depression

<table>
<thead>
<tr>
<th>Genetic predisposition</th>
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<tbody>
<tr>
<td>Response to uncontrollable loss (mate, job, status, health)</td>
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<tr>
<td>Symptoms:</td>
</tr>
<tr>
<td>– sadness</td>
</tr>
<tr>
<td>– loss of energy, initiative</td>
</tr>
<tr>
<td>– hopelessness</td>
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<tr>
<td>– worthlessness of self</td>
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<tr>
<td>– lack of optimism (sometimes accurate!)</td>
</tr>
<tr>
<td>– loss of pleasure (food, sex, friends, interests)</td>
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### Depression, cont.

- Is depression good for anything?
  - slow down, reassess goals, think realistically (not optimistically)
  - signal need for help
  - internal punishment: flip side of love, value

### Treatment of major depression:

- Drugs that increase availability of serotonin (Prozac)
- Cognitive-behavioral therapy:
  - Change negative thoughts about self, world; attribute them to temporary details of situation
  - Get person out in the world
  - *Combination* sometimes most effective