Animal Awareness

consciousness in terms of intentions (Griffin):

> An intention involves mental images of future events
> in which the intender pictures itself as a participant
> and makes a choice as to which image it will try to
> bring to reality.

Nature (innate) or Nurture (learning):

much at stake, politically & economically

EPIGENESIS – interaction of an organism's genetic factors and its environment upon the developmental process, through which the GENOTYPE is expressed in the PHENOTYPE (e.g., TSD of turtles)

Learning: Behavioral modification traceable to specific experience with a particular stimulus.

> The ability to modify one's behavior based on experience.
>
> Adaptive behavioral change that occurs within the lifetime of an individual as the result of that individual's experiences.

The Ethology of Learning:

1. has a genetic basis - special nerve networks
2. is a product of the genetic-development (ontogenetic niche) program
3. is a product of natural selection (differential reproduction)
4. is ecologically adaptive (genetically influenced trait which increases fitness

Types of Learning

I. Habituation

Learning to ignore inconsequential stimuli

II. Associative Learning

A. Conditioned Reflex (Pavlov)

UCS [CS] → UCR

B. Trial & Error (no prior UCS) - appetitive behavior (exploratory, hunger, thirst, etc) expose animal to reinforcers by chance.

1. Instrumental (Thorndike)

2. Operant Conditioning (Skinner) - shaping

a. Positive Reinforcement –>probability of response via pleasurable rewards

b. Negative Reinforcement –
> probability of response by
maintaining an unpleasant stimulus until response appears (whining)

c. Schedule for reinforcement

1. continuous (best initially)
2. fixed ratio (piecework)
   Rapid repetition
3. random ratio (slot machine)
   Slow extinction

Generalizations of Associative Learning:

1. Any stimulus has potential as a conditioned stimulus (CS)
2. The CS (i.e. reinforcer) must be temporally associated (within seconds) to form a conditioned response (CR)

However, certain associations may be ADAPTIVE and transcend classical learning theory. For example:

John Garcia

Saccharine water + flashing lights + X-rays → rats get sick 7 hours later. Rats now avoid saccharine water, but not flashing lights.

Saccharine water + flashing lights + electric shock → rats after many trials avoid flashing lights, but still drink saccharine water.

If sick after eating familiar food, no association made

III. Latent Learning

The association of indifferent stimuli without potential reward (curiosity & exploration)

Associative (operant) learning without a reward

IV. Insight Learning (internal trial & error)

An indication of perception, memory, and *thinking* Qualities of cognition and consciousness

V. Learning Set (learning to learn)

Deriving a principle, once learned can be applied to similar problems

VI. Observational and Imitation Learning

VII. Play

VIII. Imprinting

1. Sensitive period for specific kinds of information
2. Irreversible
3. Ontogenetically driven
4. Information learned:
    - Preference for mates, habitat, food
    - Parent-offspring bonds
    - Song characteristics
    - Following responses
    - Homing stimuli

Harry Harlow (classic)

Rhesus Monkeys - Social Development

Infant-Mother Affectional Stage

1. Reflex Stage (10-20 days)
    - a. Clasping
    - b. Nipple searching
    - c. Head righting
2. Comfort & Attachment
    - a. Bond forms between infant & mother
    - b. Infant remains close
        1. Nursing (majority non-nutritional)
        2. Clinging
        3. Imitating mother's behavior
3. Security Stage (exploration)

4. Separation Stage
    a. > age-mate associations
    b. Compliments mother's Ambivalent Stage

Age-Mate Affectional Stage

1. Rough & tumble
2. Rough & tumble + Non-contact play
3. Aggressive play
    a. Establishes social hierarchies
    b. < after a while, especially if there is contact with an outgroup

Mother-Infant Affectional Stage

1. Maternal attachment & protection
    a. Handles nutrition, temp., & elimination needs of infant
    b. Gives physical support, contact comfort, & security
    c. Gives protection
2. Ambivalent Stage
    a. Relaxes constraints
    b. Disciplines
    c. But remains attentive

3. Separation Stage
    a. Can be abrupt
    b. Next infant on the way
    c. Some anxiety in juvenile

During peer interactions, juveniles:

1. Prefer same-sex playmates
2. Develop affection for peers
    a. Inhibit aggression
    b. Enhance basic social rules
    c. Mature basic sexuality

Disruption of social ontogeny:

1. Total isolation destroys social-sexual activities
    a. Exaggerated oral-activities
    b. Self-clutching
    c. Apathy
    d. Stereotyped movements

Duration of isolation

3-months: can recover with interactions with norm peers

6-months: autistic, showing inappropriate fear & aggression

12-months: absolute fear

Motherless adult females (if impregnated) show no affection to their infants and commonly abuse them

[DEVELOPMENTAL HOMEOSTATSIS]

INNATE/LEARN CONTINUUM

Restricted Developmental Program

Fixed Action Patterns (FAP)

Species-specific, stereotyped (e.g., spider webs, cricket songs)

Reaction Chains

Response chains of FAPs (e.g., stickleback courtship)

Semi-restricted Developmental Program

Very restricted kinds of information learned, usually associated with specific events, and frequently irreversible (e.g., imprinting)

(e.g., wasp homing to burrow, digging wasp provisioning nests, white-crown sparrow song dialects)

Plastic Developmental Programs

Very flexible and reversible learning (e.g., associative learning, insight learning etc.)

(e.g., Preying mantis/milkweed bug, Imo washing technique, rhesus monkey socialization)

Cognitive mechanism: Acquires, processes, stores, and acts on information from the environment

1. Use past experience to match contingency events with appropriate behavior by generating predictions about the environment and the behavior of others.

2. The inference from flexible, contingency-dependent behavior points to decision making on the part of animals.

2. Found in such phenomena as partner choice, communication, food caching and recovery, and navigation and orientation.