Classical Ethological Concepts

Appetitive Behavior
Unstructured searching/exploratory movements associated with "drive" behavior

Consummatory Act
Stereotyped behavior of a "drive" once a proper stimulus is encountered

Fixed Action Pattern (FAP, or Modal Action Pattern)
Species-specific, stereotyped, largely innate behavior

Sign Stimulus (aka releaser, social releaser)
Stimulus for a FAP

Intention Movement
Partial expression of a FAP Vacuum Behavior

Vacuum Behavior*
A context-specific behavior expressed w/o an apparent stimulus

Re-directed Behavior*
An appropriate behavior for the context, but directed at the wrong object

Displacement Behavior*
An inappropriate behavior for the context
Conflict Behavior (Desmond Morris)

One possible source for evolution of signals

THWARTING STIMULUS CONTEXTS

   I. Absence of an indispensible stimulus, following intense arousal
   II. Simple physical obstruction of aroused activity
   III. Simultaneous arousal of two or more incompatible tendencies

RESPONSES TO ABOVE CONTEXTS

   A. Primary Responses

      1. Somatic responses

         a. Perseverence (I & II) - animal attempts to continue w/aroused activity despite circumstances.

         b. Snap Decision (III) - animal quickly response to one aspect of relevant stimuli.

            c. Thwarted Intention Movements (I, II, III) animal gives partial expression of thwarted activity.

            d. Ambivalent Posturing (III) - "Law of Antithesis" - intermediate expression

            e. Alternate Ambivalent Movements (III) - animal alternates between to opposite behaviors.

      2. Autonomic Responses

         a. Alimentary (e.g., >, < salivation, urination, defication)

         b. Circulatory (e.g., flushing, fainting)

         c. Respiratory (e.g., gasping, yawning, sighing, panting)

         d. Thermoregulatory (e.g., sweating, pilio erection)

         e. Lacrimatory (e.g., weeping)
B. Secondary Responses

1. Displacement Behavior

2. Re-directed Behavior

3. Regressive Behavior

4. Neurotic Behavior

Life History Traits (trade-offs)

I. Metabolism (caloric needs, temp regulation)

A. Exotherm

B. Endotherm

II. Site of embryonic development

A. Oviparous (egg layer) - optional parental care

B. Viviparous (embryo w/in female) - mandatory parental care

III. State of development upon hatching (birth)

A. Precocial (can disperse from nest site)

1. independent of parents

2. follow parent, find own food

3. follow parent, shown food

4. follow parent, fed by parent

B. Semi-precocia (stay at nest, but can walk)

C. Semi-altral (cannot leave nest, down covered)

D. Altral (helpless)
IV. Family Units
   A. Maternal
   B. Paternal
   C. Biparental

V. Food habits

Kinds of Group Patterns
I. Kin Groups
   A. Clones
   B. Families
   C. Extended Families

II. Mating Groups
   A. Pairs
   B. Harems
   C. Leks

III. Colonial Groups
   A. Nesters
   B. Communities

IV. Survival Groups
   Non-breeding aggregations

V. Coincidental Groups
   Attraction due to abiotic factors
Why Group?

Advantages

1. Reduce risk of predation (detection & repulsion)

2. Improve foraging (manipulate prey)

3. Improve resource defense (space, food, mates)

4. Improve offspring care

5. Improve efficiency (division of labor, habitat modification)

6. Population regulation (not necessarily to the individual's advantage)

Disadvantages

1. Increase competition

2. Increase risk of disease & parasites

3. Increased risk of exploitation

4. Increased risk of infanticide

[Why stay in a group if detrimental to individual fitness?]
SEX & VIOLENCE makes the world go round

Individual Selection is the mechanism which fosters inter-individual conflict. Resources are limited. How is the conflict resolved?

Individual territoriality

Group territoriality

1. help defend against out groups

2. Social hierarchies resolve internal conflicts (top-down authority)

Types of Selection

Natural Selection (& artificial Selection)

Group Selection

Individual Selection

Ecological selection ($r/K$, habitat, predation)

Kin selection ($K > 1/r$)

\[ K = \frac{B}{C} \times r \]  

inclusive fitness = direct + indirect

Sexual selection

Intra-sexual selection

Inter-sexual selection
<table>
<thead>
<tr>
<th>Variable</th>
<th>( r )</th>
<th>( K )</th>
</tr>
</thead>
<tbody>
<tr>
<td>where</td>
<td>temperate zone</td>
<td>tropics</td>
</tr>
<tr>
<td>Climate</td>
<td>variable</td>
<td>constant</td>
</tr>
<tr>
<td>Mortality</td>
<td>density-independent</td>
<td>density-dependent</td>
</tr>
<tr>
<td>Population</td>
<td>variable</td>
<td>constant ((=K))</td>
</tr>
<tr>
<td>Size</td>
<td>variable, frequently low</td>
<td>usually keen</td>
</tr>
<tr>
<td>Competition</td>
<td>variable, frequently low</td>
<td>usually keen</td>
</tr>
<tr>
<td>Selected Traits</td>
<td>rapid develop.</td>
<td>Slow develop.</td>
</tr>
<tr>
<td></td>
<td>high reprod. (( r ))</td>
<td>low</td>
</tr>
<tr>
<td></td>
<td>good colonizer</td>
<td>poor</td>
</tr>
<tr>
<td></td>
<td>short life cycle</td>
<td>long</td>
</tr>
<tr>
<td></td>
<td>small adult body size</td>
<td>large size</td>
</tr>
<tr>
<td></td>
<td>little parental care</td>
<td>much care</td>
</tr>
<tr>
<td></td>
<td>precocial young</td>
<td>altricial young</td>
</tr>
<tr>
<td></td>
<td>semelparous</td>
<td>iteroparous</td>
</tr>
<tr>
<td></td>
<td>high genetic diversity</td>
<td>Low</td>
</tr>
<tr>
<td>Niche</td>
<td>broad</td>
<td>narrow (symbiosis)</td>
</tr>
<tr>
<td>Community</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Diversity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>