Four themes run through this textbook: (1) natural selection, (2) trade-offs, (3) the social environment edits genotypes and (4) the physical environment edits genotypes in gene pools.
1.1 Group Selection (Davies et al. 2012, Fig. 15.1)

- H
- A
- N
- U

Credit: J. Travis

1.4 Poll - let's see if you understand

About which topics would you like to chat more?

a) Appl

2. PROXIMATE/ULTIMATE

The two-fisted baby
2.1 What is missing? (Davies et al. 2012)

2.2 Cause/Function (Davies et al. 2012:437, Fig. 15.4)

- Black-tailed Prairie dogs (Cynomys ludovicianus) are colonial and make underground tunnels.
- Tunnels appear to be U-shaped, up to 15 meters long, and with an entrance on either end (Niel et al. 1973).
- Note that one entrance has steep mounds (left) while other has low dome mounds (right).
- Thought to be just lookout points for predators or flood prevention.
- But why are the mounds shaped differently on either end?

Credit by F. Cartaya

Slide 9

2.2 Cause/Function (Davies et al. 2012:437, Fig. 15.4)

- If we want to know why an organism performs certain a behavior, we are seeking a functional explanation.
- Control of the exchange of air currents.
- Domed shape mounds allows fresh air to be sucked in easier and is expelled through the steep mound.
- Fresh air exchange is a key survival factor for prairie dogs.
- Take Home: Though causal and functional explanations may ask different questions, they are complementary of each other.
- Base point of Behavioral ecology is through the observation and discovery of functional explanations.

Credit by F. Cartaya
This can occur as a result of proximity of alleles on a gene or through pleiotropy (a locus affects more than one trait/process).

Notes to talk through the class with:

- There is a fitness “disadvantage” for the allele linked to the G allele in coat color, resulting in homozygous G individuals having a reduced fitness.

  - This results in the decline we see in the graphs from homozygous G to heterozygous and homozygous recessive individuals.
Adding a “tool” to our toolkit. Assumptions are a better match to reality than optimality theory. Predicts which genotype will increase in % in a gene pool, based on the other genotypes present. Basis for prediction how individuals choose to switch tactics depending on what others are doing in the social context.
2.5 Poll - let's see if you understand
About which topics would you like to chat?
   a) Concept
   b) I'm good, let's move on

Let's dialogue more about this using the elearning discussion tool.

3. FUTURE DIRECTIONS
Keeping the ecology in behavioral ecology

Davies et al. 2012 Fig. 5.13
3.1 “Personalities” (Davies et al. 2012:143)

- Phen

3.2 Genetic polymorphism (Davies et al. 2012:139)

3.1 Lizard polymorphism (Davies et al. 2012, Fig. 5.19)
3.4 Poll - let's see if you understand
About which topic would you like to chat more?
a) Concept
b) I'm good, let's move on

Lets dialogue more about this using the elearning discussion tool

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Summary (Davies et al. 2012:441)

Overview of Behavioral Ecology:
1. **Optimality models**: "selfish gene", value/limitations, multi-level selection (genotype, individual, group, population)
2. **Proximate/ultimate**: integration of cause & function; critique: development & phylogenetic history often missing
3. **Future**: growth, expansion in novel new directions; critique: over emphasis on invertebrate systems to test complex theoretical predictions (loss of field ecology)