

# Lecture 16. Social behavior

## Class Business

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## Reading for this lecture

Required. Gill: Chapter 11

### 1. Introduction

#### A) SPACING

The nature of social interactions between birds is influenced by their spacing patterns. In simple terms there are three basic ways that birds can distribute themselves with respect to each other:

- They can act in a way that keeps them separated from others. A common manifestation of this is territorial behavior.
- They can be sociable and seek out opportunities to group together with other individuals: this leads to flocking behavior.
- They can completely ignore what others are doing and simply respond to some other aspect of the environment that is important to them (e.g., food availability, suitable nest sites, etc.).

#### B) WHICH OTHER BIRDS SHOULD A BIRD RESPOND TO?

- A key question facing both territorial birds and those seeking a flock is: which other birds should they react to? Just birds of the same species? The same sex? Any bird?
- In general, the answer is that a bird should respond in whatever way maximizes the benefits it receives. An individual bird's needs are likely to be most similar to the birds that are most like it (i.e., birds of the same species).
- Hence, birds of a feather often do flock together. However, different species will form multi-species flocks whenever the thing that benefits flock members applies to multiple species.
- Similarly, territorial birds usually defend territories against members of the same species. During the breeding season, birds generally only defend against members of the same sex because they obviously want members of the opposite sex to come into their territory. During the nonbreeding season, however, these same birds may defend a territory against all members of the same species irrespective of the individual's sex.
- In some cases birds will defend a territory against members of a different species. Under what circumstances do you think that this is likely to occur? If you had two species exhibiting **interspecific territoriality** what characteristics do you think they would share?

### 2. Territoriality

#### A) DEFINITION

i) A **territory** has the following distinguishing features:

- It is a fixed area. Usually, the term refers to fixed piece of land, but it is possible to have a "mobile" territory, e.g., if the fixed area is the area around a mate that a bird is trying to prevent others from mating with.
- It is defended continuously. (This makes a territory different from a **home range**. The latter is a term that is used for an area where an individual spends the bulk of its time, but a home range is not necessarily defended.)
- It is used only by the defending individual and (sometimes) their mate(s) and offspring.
- Usually territorial defense involves some combination of ritualized displays (e.g., singing) to warn others not to enter and active aggression (e.g., chasing, fighting) to keep intruders out.

#### B) BENEFITS OF TERRITORIALITY

- The fundamental benefit of territoriality is that it provides exclusive access to some resource.
- There are lots of resources that a bird might choose to defend. Among the most common are: food, mates, good nest sites, good places to hide from predators. Often a territory will have several of these things (this applies to most breeding season territories). At other

times, a territory may be defended for a single resource (e.g., hummingbirds frequently defend patches of flowers during the nonbreeding season).

- iii) In some cases a bird will defend an area in order to provide potential mates with access to resources; in other words, by defending an area that is rich in food during the breeding season a bird not only improves their own ability to feed, but also increases their chance of obtaining mates that are attracted to the resource-rich area where the territory lies.

#### C) TERRITORIES HAVE COSTS

- i) Territories can be costly to defend. Pronouncing ownership and keeping out intruders can be energetically expensive, it can take up a lot of time that could be spent doing other things.
- ii) In addition, although it is rare for things to escalate this far, aggressive interactions with intruders can lead to fights and to injuries.
- iii) Finally, many territorial behaviors (e.g., singing from prominent songposts) can make birds very conspicuous to predators and might increase the risk of getting eaten.

#### D) WHEN SHOULD A BIRD DEFEND A TERRITORY?

- i) Although there can be substantial benefits to being territorial there can also be substantial costs. Consequently, birds should only defend an area when the benefits outweigh the costs.
- ii) In addition there is no point defending a resource unless access to it is limited.

#### E) HOW BIG SHOULD A TERRITORY BE?

- i) Territory sizes vary from species to species, from place to place, and sometimes depending on the time of year. At all times, though, the ideal size is that which maximizes the relative benefits compared to the costs (see Gill: Fig 14-3).
- ii) The “optimal” size will consequently depend on all the different things that influence both the costs and the benefits. These include the abundance of the resource and its distribution in time and space; the distribution of competitors against whom the resource must be defended; the distribution of predators; etc.

### 3. Sociality

#### A) BENEFITS OF BEING IN A GROUP

- i) Reduced predation risk: because there are more individuals to look for predators, because some other individual is more likely to get caught (the “selfish herd” idea), because the predator is more likely to become confused when in a big swirling mass of birds, maybe also because better able to defend against a predator and reduce their access (e.g., colonial birds often can drive predators away from their nests by working in a group).
- ii) Increased foraging success. Birds can use information on what others are doing to help find food. Birds may stop when they see other birds feeding (this is why duck decoys work). One argument for colonial nesting is that an individual can observe the direction successful foragers come in to the colony from or follow successful foragers to find out where they are feeding. In some cases, birds may benefit from feeding in a group – e.g., pelicans can herd fish into shallow water and increase their capture rates.
- iii) Improved thermoregulation. Some birds benefit from roosting together because they all can take advantage of the heat that they collectively produce. Certain small birds often get together in communal roosts (often in tree cavities), especially in very cold weather.

#### B) COSTS OF BEING IN A GROUP

- i) Increased competition.
- ii) May attract predators (because a big group is more conspicuous than a single individual).
- iii) There may be a greater risk of disease or parasitism (because greater risk of exposure).

#### C) NEUTRAL SPACING

In some cases it can be difficult to tell whether birds are actively seeking to be around other birds, or if a lot of birds simply gather in the same place for the same reason. If a resource (e.g., food, nest sites) is very patchily distributed then birds may all converge on the same patches even if they pay no attention to what others are doing. Consequently, there may be cases where there are no benefits for being in a group.