Learning objectives for today

By the end of today, you should be able to:

1. Model the ontogeny of song learning in a typical songbird and compare how song development varies across species.

2. Evaluate different adaptive hypotheses for song learning.

3. Apply your knowledge of tree reading to the origin and evolution of vocal learning in birds.
Why do we think some birds learn to sing?

Human dialects in the United States
Birds also have geographic variation in song, or dialects.
Think-pair-share:

Take one minute and **think** about the evidence indicating that songs are learned in some bird species.

How would you **test** whether or not birds learn their song rather than being born able to produce the song with no experience?

**Pair** with your neighbor for one minute and find out what they think.

**Share** your ideas with the class.
Building a model of song development

Mature Male Song
“Tutor” + Critical Period + “Auto-training” = Full Song

Sensory Phase
Sensorimotor Phase
Crystallized Phase

Timeline: age of individual

Tutor

Subsong
Plastic song
Full song
Song Development of a Swamp Sparrow: Weeks 11–49

Subsong (week 11)

Early plastic song (week 40)

Late plastic song (week 42)

Crystallized song (week 49)
ALE 1: Development of singing behavior

In your groups,

1. Sort your sonograms into a timeline.

2. Draw a model and label: subsong, crystallized phase, plastic song, sensorimotor phase, crystallized song, sensory phase.

3. Write a description of the similarities between song development and human development of speech. You can discuss as a group but write your own description to hand in.
How might *learning* a song promote reproductive success?
Matching songs to the habitat

Great tit

- Forests
  - Sweden
  - Norway
  - England
- Woodlands
  - Spain
  - Iran
  - Morocco
Song type matching mediates aggression

More

Aggressiveness of response

Less

Focal bird

Sings shared song

Sings repertoire match

Sings unshared song

Neighbor

Sings type match

Stays on same type and responds aggressively

Focal bird

Sings type match

Switches to a different song
Females use song to assess male developmental history

(A) Tape tutor song

(B) Good copy of (A)

(C) Tape tutor song

(D) Poor copy of (C)

(E) Mean number of displays

Good copies  Poor copies

1 second
Q. How many times was vocal learning lost if it evolved once at the most recent common ancestor of song learners (tMRCA)?

a. 3  
b. 7  
c. 4  
d. 1

Think pair share
Last year, a new phylogenetic hypothesis was published.
Q. How many times was vocal learning lost if it evolved once at the most recent common ancestor of song learners?

a. 8
b. 5
c. 6
d. 3