

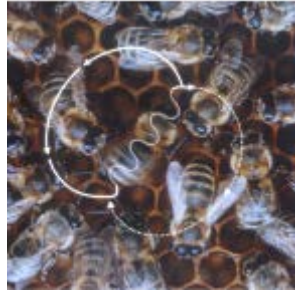


Communication and parental care



Communication

- Signal sent from one individual to another with effect of altering recipient's behavior
- Types:
 - Foraging
 - Alarm calls
 - Sexual behaviors
 - Threat



Gazelle stotting



Communication

- Signal sent from one individual to another with effect of altering recipient's behavior
- Types:
 - Foraging
 - Alarm calls
 - Sexual behaviors
 - Threat
 - Deception???



Honest signaling

- Most signals benefit signaler ('s genes)
- Do some animals signal to *manipulate* others?
 - Give warning call of predators so others flee while you get food?
 - Fool opponents into thinking you're stronger than you are?



Honest signaling



- Most signals benefit signaler ('s genes)
- Do some animals signal to *manipulate* others?
 - Give warning call of predators so others flee while you get food?
 - Fool opponents into thinking you're stronger than you are?
- **Dishonest signals difficult to maintain**
 - Selection favors ignoring them
 - As “ignoring” spreads, no longer elicit response

Honest signaling



- Most signals benefit signaler ('s genes)
- Do some animals signal to *manipulate* others?
 - Give warning call of predators so others flee while you get food?
 - Fool opponents into thinking you're stronger than you are?
- **CONDITIONS FOR DISHONEST SIGNALS:**
 - Cost for not responding high
 - Rare relative to honest signal

Fatal attraction in fireflies...

- Meet friendly *Photinis*
 - Males flash to find females
 - Females flash back
 - They take it from there...



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- In comes less-friendly *Photuris*
 - Flash just like *Photinis* females
 - *Photinis* males are attracted

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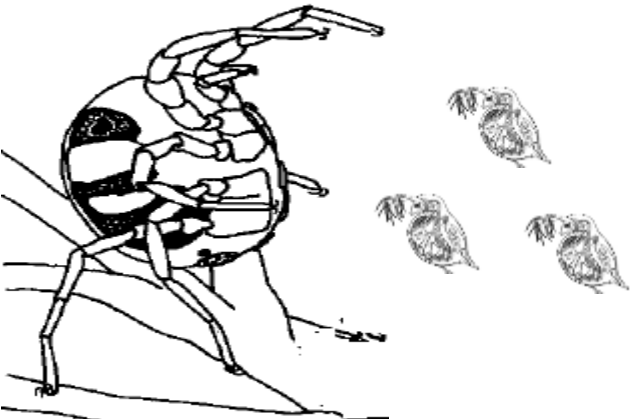


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 - Flash just like *Photinis* females
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Also works the other way:

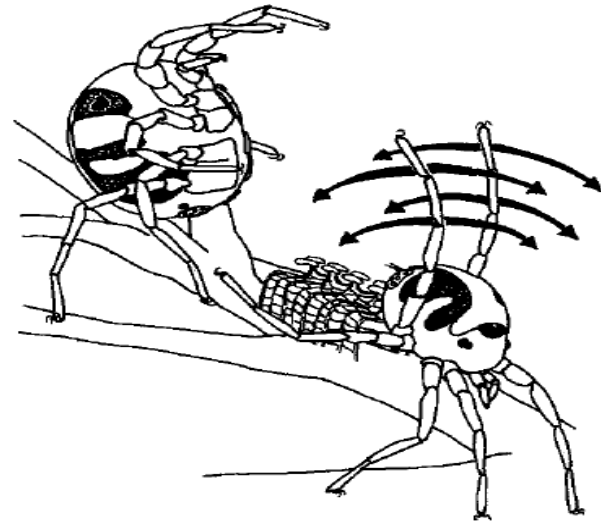
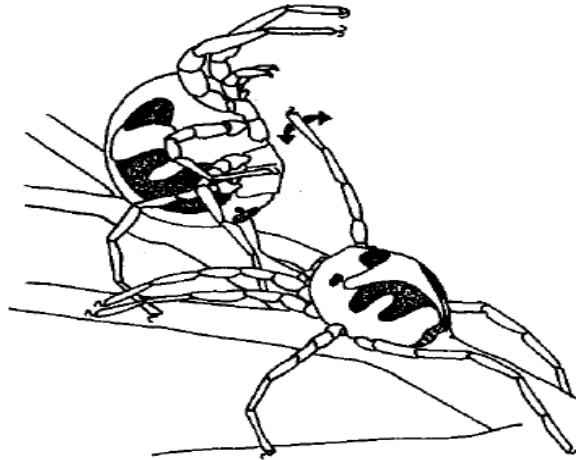
Exploiting feeding preference for “mating”

- Water mite *Neumania papillator* eat passing crustaceans
 - Stand upright and capture passing animals
 - Detect prey based on vibrations in water



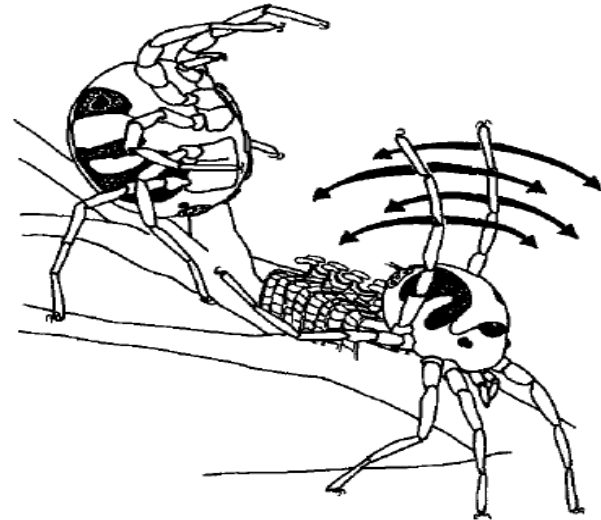
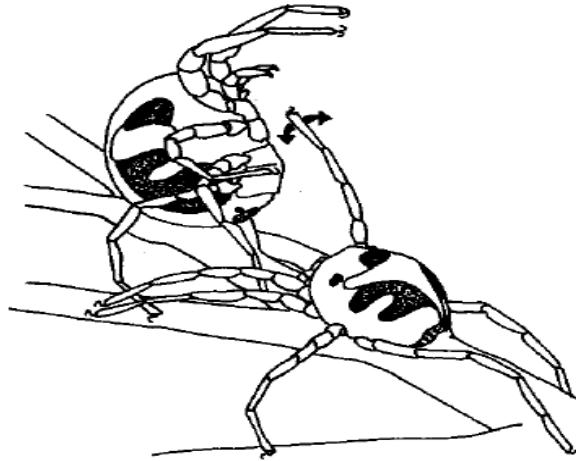
Exploiting feeding preference for “mating”

- Males vibrate legs to create current like prey
- Females orient towards males and grab at them
- Males then fertilize eggs



Exploiting feeding preference for “mating”

- ... or is this “adaptive storytelling”???
- If evolved mating behavior in response to feeding behavior, do we predict greater response in **hungry** or **full** females?



Meet the European Common Cuckoo...

- Obligate “brood parasite”
 - Doesn’t raise its own young



Meet the European Common Cuckoo...

- Cuckoo mom replaces some of “host’s” eggs with her own
- Cuckoo chicks hatch earlier, often push host’s remaining eggs out of the nest
- Cuckoo chick demands food, and host provides
 - Dishonest signal for parental care!



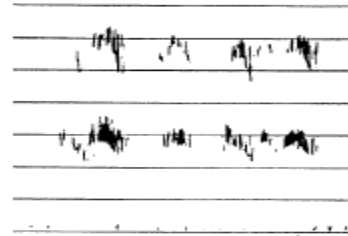
Are the hosts just stupid? No



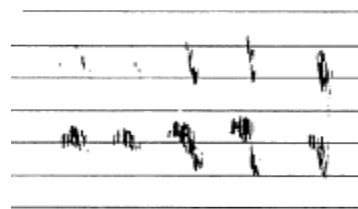
N. Davies

- Two factors stimulate host birds to feed the cuckoo “parasite”
 - Large size
 - Begging call rate match that of “real” offspring

Reed warbler:



Cuckoo:



Are the hosts just stupid? No



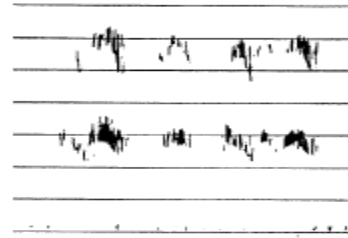
N. Davies

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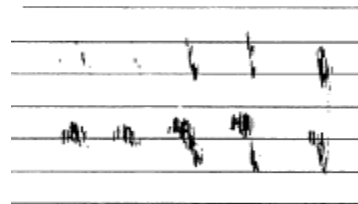


Studied using
recorded calls

Reed warbler:



Cuckoo:



But can't they figure it out???

- Some can, but options limited
 - Some warblers try to push out cuckoo eggs but accidentally push out their own, too
 - Some abandon nest altogether, but their offspring die





Anders Møller

But can't they figure it out???



- Some can, but options limited
 - Some warblers try to push out cuckoo eggs but accidentally push out their own, too
 - Some abandon nest altogether, but their offspring die
- “Mafia hypothesis”
 - Cuckoo mom attacks nests of birds that eject her offspring!

Some signals “intercepted” ...

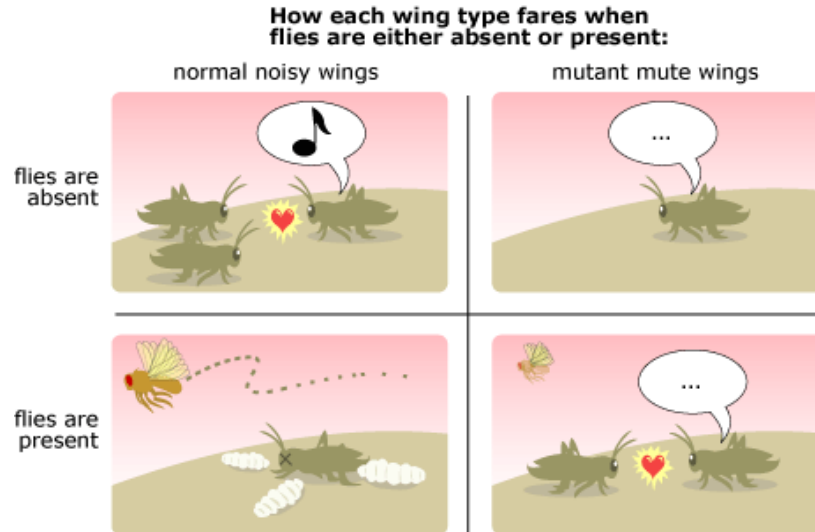


- Predators & parasitoids home in on signals from prey
 - *Ormia* parasitoid flies home in on calling song from male crickets in Hawaii (Kauai), lays eggs on it
 - Precise eardrums in *Ormia* allows perfect localization of crickets
 - Only observed in female *Ormia*, not males!



... but crickets responded evolutionarily.

- Between 1991 & 2001, major drop in cricket population due to parasitoids
- New mutation on X-chromosome arose, making “mute” crickets
- **Now, cricket population rebounded, but nearly all are mute!**





Topics

- Communication
- Parental care



Varying levels of parental care...

- **None** - investment ends with indiscriminant gamete release
 - Marine invertebrates
- **Weak** - e.g., strategic laying of eggs
 - *Drosophila*
- **“True”** - significant investment
 - Birds, dogs, (most) humans, etc...



Females usually do most of the parental care

- Females more likely to provide food
- Females more likely to defend kids
- Why?



Females usually do most of the parental care

- Females more likely to provide food
- Females more likely to defend kids
- Why?
 - Paternity certainty often lower than maternity
 - Males can “sneak off” briefly to mate more often in a short time-period
 - Females invest more in eggs, so worth more to continue to invest



Exceptions to the rule



Abedus indentatus, male giant water bug



Broad-nosed pipefish (*Syngnathus typhle*)

Figure 11-6a Evolutionary Analysis, 4/e
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Exceptions to the rule

- Lack of tradeoff between mate attraction and parental care
 - Stickleback males tend nests and attract females
- Cost to care may be disproportionately great for females



Topics covered

- Optimality
- Adaptive feeding behavior
- Communication
- Parental care



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