Why study animal behavior?

- Conservation
  - Which animals are affected by forest fragmentation?

- Industry – pine beetles in B.C.
Why study animal behavior?

- Human health
- Avian influenza and migration routes
Why study animal behavior?

- Understanding human behaviors
Why study animal behavior?

- Curiosity
Communication
Reproductive behavior
Parental behavior

Konrad Lorenz
1973 Nobel Prize
Course goals

- Understand how to study animal behavior

- Encourage **critical and creative thinking:**
  - What is good about the experiments that were done?
  - What is wrong/limitation with the experiments that were done?
  - What is not known?
  - What experiments should be done next?

- Improve oral and written communication

- **Questions during lectures are highly encouraged**! I can’t emphasize this enough.
Instructors

- Dr. Kiran Soma
  - Office hours: Wed 2–3 pm in Kenny 3505, or by appointment
  - 604-827-5820

- TA: Shaina Cahill
  - Office hours: Tues 4-5 pm in Kenny 3512, or by appointment
  - scahill@psych.ubc.ca

**Email only to schedule in-person meetings**
Required textbook

- **10th Edition**
- UBC Bookstore or Amazon etc
- Hardcopy or PDF version OK
- One copy on reserve at Koerner

- **Definitions in back**
- References in back

- **Do the readings (see syllabus!)**
  (have a quick look before lecture, and then read thoroughly soon after lecture)
Lectures

- Lecture slides posted online (pdf), the day before the lecture – **print and bring to lecture**

- [www.psych.ubc.ca/~ksoma](http://www.psych.ubc.ca/~ksoma)

**Slides will be missing critical information (will be on the exams), so attend all the lectures and actively participate.**

**This is the most important way to succeed in this course!!**
Lectures

• **During lectures, please turn off and put away**
  - phones
  - laptops
  - tablets

• **Please do not arrive late.**

• Please do not get ready to go before the lecture is finished.

• Actively participate in class.
Course evaluation

- See syllabus!
- Midterm exam: 35%
- Paper: 15%
- Final exam: 50%
Course evaluation

- Exams will include multiple choice and short essay questions

- **Strong emphasis on critical thinking**
  - Analyzing experiments, interpreting data, and proposing new experiments

- **We will practice in class & you should also practice at home** (this is key)
Make-up exams

- Only for validated medical reasons
- Must email me within 1 day of the exam
- Submit documentation

- Make-up exams will be **oral exams** in the presence of instructor & TA
Paper

- See syllabus!
- **2 pages, double spaced**
- Choose newspaper article about animal behavior and then find the original research article
- Critique both
- We will provide an example for you
Course grades

- Class average of 66-70
- Standard deviation of 13

Last year: average=68, SD=13
- 80-100 (A) 23%
- 68-79 (B) 36%
- 55-67 (C) 21%
- 50-54 (D) 13%
- 0-49 (F) 7%

- Academic misconduct will be treated very seriously
Outline

• Scientific method

• Levels of analysis (Tinbergen’s questions)
What is science?

Just a way of trying to understand the natural world.

http://www.ted.com/talks/beau_lotto_amy_o_toole_science_is_for_everyone_kids_included.html
Scientific method

Observation

Question

Hypothesis

Prediction

Test: Experiment or additional observation

Does not support Hypothesis (revise or make a new one)

Supports hypothesis (make additional predictions and test)

Pass many tests

Continue to test

Theory
Levels of analysis

- The causes of any behavior can be understood at four levels of analysis.
- “Ultimate”: phylogeny & function
- “Proximate”: development & immediate causation
Levels of analysis

How has it evolved?
(evolutionary origins)

What is its current function?
(effects on lifetime reproductive success)

How does it develop?
(genes, environment)

What immediately causes it?
(sensory-motor mechanisms / hormones)

All 4 levels are important
What causes prairie voles to be monogamous?
Monogamy in voles

- Monogamous
  - e.g., prairie voles
  - pair bond
  - rare among mammals

- Non-monogamous
  - e.g., meadow voles
  - common among mammals
What causes prairie voles to be monogamous?
Receptor for Vasopressin

- Male voles
- Vasopressin receptor ($V_{1a}R$)
- **Non-monogamous:** higher expression in lateral septum (LS)
- **Monogamous:** higher expression in ventral pallidum (VP)
- Increase $V_{1a}R$ expression in adult males
- non-monogamous vole (meadow vole)

http://www.youtube.com/watch?v=5ddlKQwDIe8

Figure 2 V1aR autoradiography at the level of the ventral pallidum. a, Meadow vole overexpressing the $V1aR$ gene in the ventral pallidum by AAV-mediated gene transfer ($V1aR$-vp). b, Meadow vole infused with the AAV control vector expressing the $lacZ$ gene into the ventral pallidum (Ctrl-vp). c, A stereotactic injection inadvertently placed too
What causes prairie voles to be monogamous?

- Genetics, for example
What causes prairie voles to be monogamous?
“Here, we report an association between one of the human AVPR1A repeat polymorphisms (RS3) and traits reflecting pair-bonding behavior in men, including partner bonding, perceived marital problems, and marital status, and show that the RS3 genotype of the males also affects marital quality as perceived by their spouses.”

“These results suggest an association between a single gene and pair-bonding behavior in humans, and indicate that the well characterized influence of AVP on pair-bonding in voles may be of relevance also for humans.”