Animal Behavior (BIOL 50b)  
Spring 2014  
Rebecca Harris, Ph.D.

Contact information  
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Drop-in office hours: Wednesday 8:00 a.m. (in classroom) other times by appointment  
Best way to get in touch: email, and if you want to talk by phone, we can set a time to talk  
Class times & room: Wednesdays 9:00-11:50 in Bassine Biology 251

**With great thanks to Dan Perlman for letting me pilfer many of the words, ideas, and assignments in this syllabus from him**

<table>
<thead>
<tr>
<th>Session/Date</th>
<th>Topic</th>
<th>Student Case Study Presentation</th>
<th>Alcock Chapters</th>
<th>Other readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 / Jan 15</td>
<td>Introduction – Evolution, Prisoner’s dilemma, observing behavior</td>
<td>none</td>
<td>1</td>
<td>“God’s Utility Function” Dawkins; Ch 1-2, Axelrod</td>
</tr>
<tr>
<td>2 / Jan 22</td>
<td>Evolution of Altruism / Eusociality *Dan Perlman GUEST</td>
<td>none</td>
<td>2</td>
<td>Dawkins “Measuring Behaviour” Ch 5-6</td>
</tr>
<tr>
<td>3 / Jan 29</td>
<td>Eusociality / Social Behavior</td>
<td>1 – honeybees – (Seeley – swarms)</td>
<td>3</td>
<td></td>
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<tr>
<td>4 / Feb 5</td>
<td>Communication</td>
<td>2 – hyena pseudo penis</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5 / Feb 12</td>
<td>Avoiding Predators / Finding Food</td>
<td>3 – stabilimenta in spiderwebs</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6 / Feb 26</td>
<td>Habitat Selection / Territoriality / Migration</td>
<td>4 – red-winged blackbirds</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7 / Mar 5</td>
<td>Reproductive Behavior / Mating</td>
<td>5 – mosquito/spider meal</td>
<td>7</td>
<td>Dr. T – Ch 13</td>
</tr>
<tr>
<td>8 / Mar 12</td>
<td>Mating Systems</td>
<td>6 – EPCs in song sparrows</td>
<td>8</td>
<td>Dr. T – Ch 11</td>
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<tr>
<td>9 / Mar 19</td>
<td>Parental Care</td>
<td>7 – lions (Packer – infanticide)</td>
<td>9</td>
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</table>
Learning Goals: Knowledge
By the end of the course, I hope that you will gain a strong understanding of the following:
- How natural selection and evolutionary history shape and constrain behavior.
- How behaviors develop from hereditary traits, environmental influences, and interactions between these.
- How behaviors have both ultimate (evolutionary) and proximate (physiological, biochemical) causes, all of which are subject to natural selection.

Learning Goals: Core Skills
By the end of the course, I hope that you will be confident in your ability to:
- Understand, analyze, critique, and discuss scientific articles orally and in writing.
- Develop and hone a scientific question.
- Observe and understand animals, which can become a lifelong passion.

Textbooks and other readings:
Required texts:

Also required: field notebook, a watch with seconds that are easily observed

Secondary readings: Articles from the primary literature will be posted on Google Drive

Supplementary texts (not required, as we will provide pdfs of a few chapters):
*Measuring Behaviour*, by Marian Stamp Dawkins
*Measuring Behavior*, 3rd edition, by Paul Martin and Patrick Bateson
*The Evolution of Cooperation* by Robert Axelrod
*Dr. Tatiana’s Sex Advice To All Creation*, by Olivia Judson

Philosophy of Learning and Teaching, and Communication
This course is not just about absorbing information, it is about learning how to analyze and how to convey information yourselves. While I will frequently deliver “mini-lectures,” much of what we do as a class will consist of joint observation, reflection, questioning, and discussion as we work together to construct your knowledge of Animal Behavior. You should not expect to sit back and just take notes; you should try to be engaged while in class, and should expect your participation will be reflected in your grade.
There are two keys to making this system work:
- You come to class having done the reading well, prepared to discuss it.
- I need to be aware of what you understand (and do not understand) from readings and class sessions.

In short, I need to hear from you regularly to make this class function. I will use several means to increase my understanding (and your understanding) of your learning:
- Short, required, written responses to the reading, submitted prior to class (“Questions & Thoughts” or QTs)
- Structured question sessions using the Question Formulation Technique [http://www.facinghistory.org/resources/strategies/teaching-strategy-question-fo](http://www.facinghistory.org/resources/strategies/teaching-strategy-question-fo)
- In-class questions (from you to me and from me to you) and discussion
- Presentations and discussion on that week’s topic and primary literature paper led by students (usually in teams of two)
- Quizzes (if warranted)
- Writing assignments (details below):
  - short literature review paper on topic of your choice
  - final project: grant pre-proposal on this topic
  - 2 animal observations
  - Dr. Tatiana-style short ‘popular press’ style essay or presentation

### Assignments / Grading

#### Questions & Thoughts (QTs)
During the semester you will respond in writing to questions about the reading before class; these should help you focus your thinking about the reading. Over the course of the semester you will write 9 QTs (out of a possible 13 – submit them all if you’re looking for extra credit) based on the reading for that class. You will often have two prompts (What did you find most confusing in the reading? and What did you find most interesting in the reading?) to which you respond with a few sentences of your thoughts (and your own questions). I will also use more specific questions about the reading at times (posted on Google Drive, within the Google Form for each week’s submission).

QTs are intended to help you focus your thinking about the readings, and are meant to be informal. You can give me your thoughts on any controversial methods or techniques used, bring in your own background, knowledge, and experiences as relevant, elaborate on connections between the papers and/or other sources. These QTs are to be very brief; please limit your responses to all questions to which you respond to no more than 300 words (in total).

You must submit your QT by 8:00 pm MONDAY night via Google Drive, so I can read your QTs before we meet to understand what you are thinking. Occasionally, I will make the QTs available to the class to read but will keep them anonymous. The practice of using QTs (which are known in the education literature as “Just-in-Time-Teaching”) has been shown to increase student learning very significantly. Students from other classes have said that if you do the reading for class carefully, writing a QT adds little to your workload. Yes, the difference between reading carefully and giving the reading a quick once-over is significant – but students have felt that they learned much more from their close reading.

The QTs represent a small portion of your grade (10%), and will be graded Check vs. Zero.

#### Case Study Presentations / Discussion Leading
Conservation work does not get done by individuals in isolation, and we want you to experience working in groups. It is also vital to be able to convey information to others and to generate discussion and interaction around a critical topic or conservation problem. Students will work together each week (with the exception of the first two weeks) to present a 15-20 minute summary of the primary literature focused on particular case studies each week, and most importantly, to lead discussion on these papers (about 20 minutes). Students who are leading the discussion should come to class with additional background information on the topic, which may include additional primary literature (some provided by instructors, some found by presenters), review articles, and popular articles that they have consulted and will present to the rest of the class.

It will be useful to have thoughtful, pointed, discussion questions integrated into your presentations in order to generate discussion – making sure the class engages in active discussion is the most important part of this exercise. It is equally important for all class members to engage with your peers as they lead discussions; remember you will have to do this too and it is not always easy to generate discussion!

To aid the discussion, Case Study presenters have the option of:

1) posting discussion questions related to the assigned reading on Google Drive no later than midnight on the Friday preceding their Case Study presentations.

2) posting a brief popular press article from a print or online source of relevance to their Case Study and/or the lecture topic of the week. This popular article, of interest to the presenters, will be intended to generate discussions on the social and political context of conservation issues. It should relate to the topic of the Case Study, but does NOT have to be focused on the same exact topic. This article must be posted on Google Drive no later than midnight on the Friday preceding their Case Study presentations.

If your team is having trouble working collaboratively, please let us know. Group work is an important part of this course, and we want to help you be successful at it. To assist you, we may also post additional references to some background primary literature and popular articles for each Case Study.

Animal Observations

Martin & Bateson (the authors of Measuring Behavior) and Marian Stamp Dawkins (author of Measuring Behaviour) emphasize the importance of exploratory observations for a variety of reasons. For example, exploratory observations give you fodder for developing research questions and creating appropriate measures of the categories of behavior that you observe. They and I cannot emphasize this enough: you must go out into the world and simply watch carefully for a while. In the words of the great American philosopher, Yogi Berra, “You can observe a lot just by watchin’.”

There are a fair number of winter-active animals on and near campus (e.g., squirrels, crows, ducks, geese, and several other bird species). Past students have also had good luck observing the gorillas and other species at the Franklin Park Zoo; seals, penguins (and others) at the New England Aquarium, and various animals at the Museum of Science, Boston. We can get discounted tickets to the Museum of Science, Aquarium, and zoo – search on the Brandeis website for these and let me know if you have trouble.

You will take detailed, time-stamped notes on your observations, using a traditional field notebook. You must note date, time, weather, and other relevant information about the conditions under which you made your observations. You can (and should) complete these observations over the course of several different visits.

The single most important bit of advice for researching is: Start Early. Animal observation takes a while to get the hang of (and your favorite beasts may be shy or absent). Your first observations will be hard – the goal is to
get you out looking at animals; if your first species doesn’t pan out, try a different one. Try 30 minute chunks and just take notes – not taking “data” – you’re just trying to understand the organism. Then try to come up with interesting researchable questions about what you’re observing. Ideally your organisms will be interacting with another animal (within or across species) for at least some of the time!

Because animal observations take a while to get the hang of, you will complete 2 observation exercises over the course of the semester. These can be on different or same organisms.

Observation 1 (600 words, due Feb 14) → aim for a total of 1 hour of observation (you will have to spend more time than this to get the hang of it)

Observation 2 (800 words, due Apr 11) → aim for a total of 2 hours of observation again

**Literature Reviews (in three flavors):**

Your literature reviews will be based entirely on the primary scientific literature, so you need to be skilled at using electronic abstracts and indices to get the best research materials. We will have an exercise on how to explore the literature and work on how to read papers. And, you can always consult with me or with reference librarians about research techniques for your papers.

Also, the Brandeis library system is strong in many areas, but animal behavior and ecology are not its very strongest. We have gotten a very significant upgrade over the last several years by getting electronic access to a number of journals that focus on these areas—but this access does not include all the relevant journals, or it might miss the latest or earliest years. You may have to go to other libraries or get articles through inter-library loan—and these take time. Harvard’s Museum of Comparative Zoology library is a good option for more obscure journals.

1. **“Dr. Tatiana” (or General Public) Essay – Due Feb 28**

This paper involves serious library research, but the paper can be humorous. You will write a short essay or give a short presentation, for the intelligent but non-scientist reader. The paper or presentation should be based on 2-3 papers from the scientific literature. Your paper should be no more than 800 words, while the presentation should be 8 minutes long (and we will hold to that!). If you choose to present your findings in class, you will submit an outline and bibliography for your presentation by the due date below. The actual presentation will be scheduled for some time during the semester.

You can either write/present in the humorous style of a Dr. Tatiana essay (see Dr. Tatiana’s Sex Advice To All Creation) or in the serious but interesting style of “Outside the Journal of Experimental Biology” essays (example posted on Google Drive). In either case, your goal is to find a couple of really interesting papers from the past three years, read them carefully, and present their findings for non-experts. In the Dr. Tatiana style, you are welcome to be as funny as you want (while being true to the underlying biology). This is not as easy as it might seem! The Outside the Journal of Experimental Biology style should be “…accessible to ANYONE who picks the journal up, from high school students to physics professors and every shade of biologist in between” (quote from the “Outside JEB Instructions”).

I would like you to append a brief but explicit description of how you found your article(s). I strongly recommend beginning with an article that you find interesting and then using Web of Science to find recent work in that vein. In the case of a Dr. Tatiana essay, you might:
1. Peruse the Dr. T. book or the Alcock textbook and find a story that interests you.
2. Use the bibliography to find the original paper.
3. Use Web of Science to find a great paper or three from the last three years.

2. Literature Review 1: The Mini Literature Review (1,500 words maximum) - Due Mar 21
This will be a short, serious literature review on at least five primary literature papers on an animal behavior subject of your choosing. You will very briefly review the studies and critique them. It is a good idea to run your idea past me at least a couple of weeks ahead of time.

3. Final Literature Review and Proposed Study - ‘Grant Pre-Proposal’ (2,000 words maximum) - Due May 1
At the end of the semester, you will write a longer paper that will be a combination of literature review (at least eight primary literature citations) and a short proposed research question. In addition, if your observations have been going well, and they are germane to your topic, you can incorporate some of these into the paper. (However, your paper can be on a completely different topic/species). The paper will include 1 page or so describing how you would propose to study this topic, based on what you have read (and possibly on your observations). This paper CAN include the information previously submitted in your first lit review, but will be expanded upon to include the “pre-proposal” – introduce your own ideas and new questions to be researched. Alternatively, you can chose a new topic if you prefer.

⇒ ALL listed paper lengths do not include the front matter (name, date, etc.) or References Cited.

Citations
⇒ In all of your writing assignments, make sure to cite properly any sources that you consult (e.g., journal article, book, interview, Web page). Please note: you may not simply lift text from a Web page and incorporate it into your own work, nor can you just change a few words here and there and claim it as your own. We will discuss this issue in class, and I will post recommended citation styles on the LATTE site.

All ideas, data, information not your own must be cited, unless they are ideas common in the literature (e.g., plants photosynthesize). Do not footnote; site all sources within the text as: (Author, year). The literature cited sections of your papers should contain all citations used, and no extras. Format for the literature cited section should follow a major scientific journal (excluding Science/Nature/TREE-type formats). Be consistent – choose one style and stick with it. A preferred example for format is below. Reference each article cited in the text in Literature Cited (alphabetized) as:

Author last name, first initial. Year. Title. Source Volume (issue): pages.


If you use a quote in the text, provide the page number of the quote in the text – e.g., (Smith 1995:334).

Citing Web pages: To cite an on-line journal, use the same format as print journals. It is also acceptable to use web citations in order to document popular interest in the topic or to cite a popular press article (but these do NOT count towards your minimum requirement of primary literature sources). Include the date you last accessed the website.
Miscellany

Participation in Class
Good participation in discussions is a matter of quality, not quantity. In a class this size, it is a challenge to give everyone the chance to speak (which is part of why I like QTs and QFTs – everyone contributes). If you think that you might be speaking too much or too little please see me. Some people tend to be slower to raise their hands than others; if you tend to be quick, please hold yourself back some of the time so that others have a chance to speak. If I do not call on you for a while, it is an attempt to balance everyone’s chance of speaking.

Since the class is discussion-based, you should feel free to ask questions during class. In return, I will feel free to ask questions of you, at any time. In other words, I will sometimes “cold call” – because I am confident that every class member will be well-prepared and will have useful contributions to make.

Laptop use
If you want to use a laptop during class, please only use it for note-taking. To those using computers and cell phones in class for non-class activities: you may think that you are anonymous and having no effect on the class – be assured that you are not anonymous, that your laptop use is distracting to your colleagues and professor, and that your focus on the laptop deprives your colleagues of your attention and thoughtful contributions. And you get short-changed, as well. If you DO want to use a laptop for note-taking, please sit in the front row.

Google Drive
I will regularly post on Google Drive, and the required primary literature readings will be here each week. I will also post updates about the course here and QT questions (in the form of Google Form – you can submit directly on these forms – make sure you check here each week to see the additional questions that may be included on the reading topic). Please check the site at least a few times a week to catch any updates and to get the readings.

LATTE: Uploading Required Assignments
I will not be posting required articles on LATTE (these will be on Google Drive – see below), rather I will use it only for class discussion forum (see below) and for you to upload (privately) your assignments by the due date (with the exception of QTs, which will be forms on Google Drive).

LATTE: Forum and Popular Press Articles
We will have a LATTE forum on which you can comment on readings, in-class discussions, news, or any other relevant topics, and you can share good research resources with your colleagues here. You can also use this as a blog for the class to discuss semi-related topics. I encourage you to share at least one animal behavior-related popular press news article here this semester – this is not required as part of your grade, but can help your class participation grade. You will have a chance to introduce the topic briefly in class – I will try to start most classes with a quick check-in on what’s going on in the news that’s relevant.

A few good places to look for popular press articles are listed below:
http://green.blogs.nytimes.com/
http://www.nytimes.com/pages/science/ (also check other newspapers)
Feedback and Communication
For this class to be a success, there should be ongoing feedback between students and instructor. I look forward to hearing from you about what is going well in the class as well as about things you have not understood or aspects of the course that could be improved. You are always welcome to speak with me in person, over the phone, via email, or via written note (signed or not).

Grading Policies
I assume that you will be in class, be prepared (having done whatever reading or writing were due for that day), and take part in classroom discussions. Unexcused absence from class, or lack of preparation, may lead to a lowering of your grade. Please talk to me if you are having trouble getting to class or preparing for class—I want you to get the most from the class that you can. **Paper lengths do not include the front matter (name, date, etc.) or bibliography. All papers due at 11:55pm, with exception of QTs, that are due Monday nights by 8:00 pm.**

Your grade will be determined as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Due Date</th>
<th>Length (max)</th>
<th>Percent of Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation 1</td>
<td>Fri, Feb 14</td>
<td>600 words</td>
<td>5%</td>
</tr>
<tr>
<td>Dr. Tatiana paper</td>
<td>Fri, Feb 28</td>
<td>800 words</td>
<td>8%</td>
</tr>
<tr>
<td>Mini Lit. Review</td>
<td>Fri, Mar 21</td>
<td>1,500 words</td>
<td>12%</td>
</tr>
<tr>
<td>Observation 2</td>
<td>Fri, Apr 11</td>
<td>800 words</td>
<td>10%</td>
</tr>
<tr>
<td>Presentation/Discussion</td>
<td>throughout</td>
<td></td>
<td>20%</td>
</tr>
<tr>
<td>Leading – Case Study</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mini Grant Pre-proposal</td>
<td>Wed, May 1</td>
<td>2,000 words</td>
<td>23%</td>
</tr>
<tr>
<td>QTs</td>
<td>Monday nights 8:00pm</td>
<td></td>
<td>10%</td>
</tr>
<tr>
<td>Participation</td>
<td></td>
<td></td>
<td>12%</td>
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**Grading terminology:** all work will be graded on a 100 point scale. This will correspond roughly to an A to D scale as follows:

- 90-100 in the A range
- 80-89 in the B range
- 70-79 in the C range
- 60-69 in the D range

**Late Papers:** I expect that all papers and homework will be turned in on time. If you find that you will need extra time, you can turn your paper in up to three days late, although your grade will be lowered five points for each day that the paper is late, as described below.

- Up to 24 hours late: 5 points taken off (e.g., 95 becomes 90)
- 24-48 hours late: 10 points taken off (e.g., 87 becomes 77)
- 48-72 hours late: 15 points taken off (e.g., 94 becomes 79)

*Papers more than 72 hours late will receive a grade of 0, unless you make arrangements with me before the original due date.*
You may find that you have a great deal of work due all at once, and you might choose to take an extra day or two to balance your work load, recognizing that your grade will be lowered. Or, you may find that you are not yet pleased with the paper you have created as of the due date; an additional 24 hours might help you create a much more polished and effective essay—one that makes you proud and that gets you a better grade even after the five point decrement.

If you have a medical or other emergency, please let me know as soon as possible, and we can discuss the rescheduling of your work. If it is a true emergency, your grade will not be lowered.

➔ In any case, please contact me ahead of time if your paper will be late for any reason.

**Official Information:**

Academic honesty (also see Citation section, above):
The following quote comes from a Brandeis University memo, written by Lori Tenser, Assistant Dean of Student Life, December 12, 2002.

> Academic integrity is central to the mission of educational excellence at Brandeis University. Each student is expected to turn in work completed independently, except when assignments specifically authorize collaborative effort. It is not acceptable to use the words or ideas of another person—be it a world-class philosopher or your lab partner—without proper acknowledgement of that source. This means that you must use footnotes and quotation marks to indicate the source of any phrases, sentences, paragraphs or ideas found in published volumes, on the internet, or created by another student.

Violations of University policies on academic integrity, described in Section 3 of Rights and Responsibilities, may result in failure in the course or on the assignment, and could end in suspension from the University. If you are in doubt about the instructions for any assignment in this course, you must ask for clarification.

**Disabilities:** If you are a student with a documented disability at Brandeis University and if you wish to request a reasonable accommodation for this class, please see me immediately. Please keep in mind that reasonable accommodations are not provided retroactively.