

Virginia Commonwealth University
Capstone Seminar: Animal Behavior
Biology 475, Section [Removed] – Summer 2019

Instructor: Jonathan Moore
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Class Times: [Removed]

Office: [Removed]
Office Hours: [Removed]
Class Location: [Removed]

COURSE DESCRIPTION:

Semester course 1 credits. Prerequisites: **BIOL 300**, **BIOL 310** and **BIOL 317** with minimum grades of C; and senior standing. Enrollment restricted to biology majors. Students read assigned topical papers before class, prepare critical analyses, discuss and debate selected positions.

COURSE OBJECTIVES

1. Lay base foundation for the study of animal behavior.
2. Review selected foundational and current literature in animal behavior.
3. Use new foundation and previous biology education to evaluate current papers in animal behavior
4. Compose short papers summarizing topics covered in class and read outside of class.

COURSE REQUIREMENTS:

1. **Readings:** This capstone is reading intensive in that you will be expected to read papers for each class and come prepared to class having either written a summary or prepared to present topics as required by the schedule.
2. **Class Presentations/Participation:** Students will be expected to present two (2) scientific papers from the literature. All papers for the class must be chosen by the Friday, May 24th to give all students enough time to read the papers. One paper must be considered “foundational” (see below) and one must be considered “current”. A current paper must have been published within the last 5 years (since 2014). For each presentation, each student is expected to lead a 25-minute discussion on the paper with the class (4 per class). This discussion should be much more than a general summary of the paper – it should include critically thinking about the methods, the analyses, and the conclusions of the paper. **All students are expected to engage in these discussions and incorporate material from their previous education and the previous discussions.** This requires not only thoughtful listening to the discussion but the contribution to the discussion in the form of voicing opinions, clarifying points, asking appropriate questions of a senior level course, making comparisons, drawing conclusions, disagreeing with appropriately scientifically defended points, and the like.
3. **Summary Papers:** All summaries should be submitted via Blackboard. All students must submit summaries of the following papers:
 - Foundations of Animal Behavior Part 1: Historical Origins (Galef)
 - Foundations of Animal Behavior Part 2: The Emerging Science (Drickamer and Snowdon)
 - On aims and methods of Ethology (N. Tinbergen)

These papers can be found in Blackboard under “First Readings”

Students will also be required to submit a summary of an additional eleven (11) readings of the primary literature discussed in class. These *may not* be a paper presented by that student. Otherwise, the papers chosen for summary are entirely up to the individual student, however summaries are due at the beginning of class in which the paper is discussed. ***No late work will be accepted.***

Point Breakdown

Paper Presentations -	100 points (50 points each)
Paper Summaries -	140 points (10 points each)
Class Participation -	160 points (8 classes @ 20pts per day)
Total -	400 points

GRADING:

- A 90-100**
- B 80-89**
- C 70-79**
- D 60-69**
- F 59 and below**

CLASS POLICIES:

1. **Attendance:** As this is a summer course, attendance is mandatory for this class. Missing more than two days will result in an automatic failing grade for the course.
2. **Course Set Up:** Except for the first day of class, the class will be discussing the papers we read. No more than two papers will be discussed per day. From time to time, there might be a mini lecture as needed to better understand the literature being read.
3. **Communication:** My preferred method of communication with students (other than in person) is via email. Having said this, I will respond to emails as quickly as my schedule allows. Therefore, you should not delay in writing an email to me that may be time-sensitive. Further, each student should identify himself or herself in the email and in which class they are enrolled. Failure to do so may delay your response or result in an unanswered email. If you choose to call, I am only guaranteed (unless otherwise specified) to be in my office during the posted office hours, however if I am in my office, feel free to stop in.

FOUNDATIONAL PAPERS/COLLECTIONS:

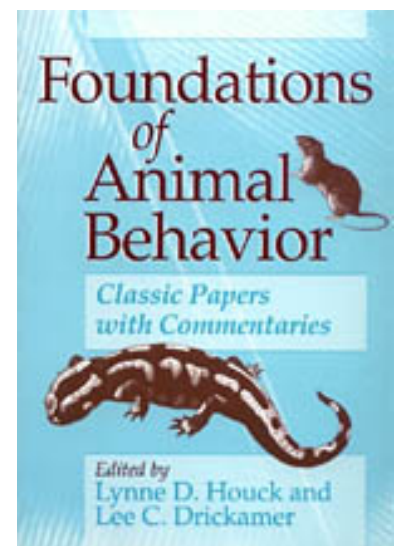
EDITED BY LYNNE D. HOUCK AND LEE C. DRICKAMER

<http://press.uchicago.edu/ucp/books/book/chicago/F/bo3629491.html>

Altruism & Kin Selection

Wynne-Edwards, V. C. (1963). Intergroup selection in the evolution of social systems. *Nature* 200: 623-626.

Wynne-Edwards, V., Maynard Smith, J., & Perrins, C. (1964). Group selection and kin selection; Survival of young swifts in relation to brood-size. *Nature* 201: 1145-1149.



Classic Empirical studies on Altruism & Kin Selection

- Sherman, P.W. (1977). Nepotism and the evolution of alarm calls. *Science* 197: 1246-1253.
- Emlen, S.T., Wrege, P.W., and Demong, N.J. (1995). Making decisions in the family: an evolutionary perspective. *American Scientist* 83: 148-157.
- Krakauer, A. H. (2005). Kin selection and cooperative courtship in wild turkeys. *Nature* 434: 69-72.
- Manning, C. J., Wakeland, E. K. & Potts, W. K. (1992). Communal nesting patterns in mice implicate MHC genes in kin recognition. *Nature* 360: 581-583.
- Holmes, W. G. (2004). The early history of Hamiltonian-based research on kin recognition. *Annales Zoologici Fennici* 41: 691-711.

Classic Empirical studies on Reciprocal Altruism, Limited-Control & Concession Models

- Wilkinson, G. S. (1984). Reciprocal food sharing in the vampire bat. *Nature* 308: 181-184.
- Carter GG, Wilkinson GS. (2013). Food sharing in vampire bats: reciprocal help predicts donations more than relatedness or harassment. *Proceedings of the Royal Society B* 280: 2573.
- Wilkinson, G. S. (1990). Food sharing in vampire bats. *Scientific American*.
- Fischer, E. A. (1988). Simultaneous hermaphroditism, tit-for-tat, and the evolutionary stability of social systems. *Ethology & Sociobiology* 9: 119-136.
- Clutton-Brock, T. (1998). Reproductive skew, concessions and limited control. *Trends in Ecology & Evolution* 13: 288-292.
- Clutton-Brock, T. et al. (2001). Cooperation, control, and concession in meerkat groups. *Science* 291: 478-481.
- Snyder-Mackler, N., Alberts, S. C. & Bergman, T. J. (2012) Concessions of an alpha male? Cooperative defence and shared reproduction in multi-male primate groups. *Proceedings of the Royal Society B* 279: 3788-3795.

Eusociality & the Return of Group Selection

- Queller, D. C. & Strassman, J. E. (1998). Kin selection and social insects. *Bioscience* 48: 165-175.
- Wilson, D. S. & Wilson, E. O. (2007). Rethinking the theoretical foundation of sociobiology. *Quarterly Review of Biology* 82: 327-348.
- Ratnieks, F. L. W. & Wenseleers, T. (2006). Altruism in insect colonies and beyond: voluntary or enforced. *Trends in Ecology & Evolution* 23: 45-52.
- Strassman, J. E. & Queller, D. C. (2007). Insect societies as divided organisms: the complexities of purpose and cross-purpose. *Proceedings of the National Academy of Sciences* 104: 8619-8626.
- Nowak, M. A., Tarnita, C. E. & Wilson, E. O. (2010). The evolution of eusociality. *Nature* 466: 1057-1062.
- Many mad-as-hornets authors (2011). Inclusive fitness theory and eusociality. *Nature* 471: E1-10.
- Alexander, R. D. (1974). The evolution of social behavior. *Annual Review of Ecology & Systematics* 5: 325-383.

Sexual Selection

- Andersson, M. (1982). Female choice selects for extreme tail length in a widowbird. *Nature* 299: 818-820.
- Wilkinson, G. S. & Reillo, P. R. (1994). Female choice response to artificial selection on an exaggerated male trait in a stalk-eye fly. *Proceedings of the Royal Society B* 255: 1-6.
- Gonzalez-Voyer, A., Fitzpatrick, J. L. & Kolm, N. (2008). Sexual selection determines parental care patterns in cichlid fishes. *Evolution* 62: 2015-2026.

Communication

- Laidre, M. E. (2009). How often do animals lie about their intentions? An experimental test. *American Naturalist* 173, 337-346.
- Logue, D. M. et al (2010). Does signalling mitigate the cost of agonistic intentions? A test in a cricket that has lost its song. *Proceedings of the Royal Society B* 277: 2571-2575.
- Backwell et al (2000). Dishonest signalling in a fiddler crab. *Proceedings of the Royal Society B* 267: 719-724.
- Rendall, D., Owren, M. J. & Ryan, M. J. (2009). What do animal signals mean? *Animal Behaviour* 78: 233-240.
- Seyfarth, R. L. et al. (2010). The central importance of information in studies of animal communication. *Animal Behaviour* 80: 3-8.
- Ryan, M. J. (1991). Sexual selection and communication in frogs. *Trends in Ecology & Evolution* 6: 351-356.
- Kimball, R. T., Braun, E. L., Ligon, J. D., Lucchini, V. & Randi, E. (2001). A molecular phylogeny of the peacock-pheasants (Galliformes: *Polyplectron* spp.) indicates loss and reduction of ornamental traits and display behaviours. *Biological Journal of the Linnean Society* 73: 187-198.
- Ron, S. R. (2008). The evolution of female mate choice for complex calls in tungara frogs. *Animal Behaviour* 76:

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1783-1794.

Meyer, A., Morrissey, J. M. & Schartl, M. (1994). Recurrent origin of a sexual selected trait in *Xiphophorus* fishes inferred from a molecular phylogeny. *Nature* 368: 539-542.

Animal Cognition (Cognitive Ethology)

Gould, J. L. (2004). Thinking about thinking: how Donald R. Griffin (1915–2003) remade animal behavior. *Animal Cognition* 7: 1–4.

Herrmann, E., Call, J., Hernandez-Lloreda, M. V., Hare, B. & Tomasello, M. (2007). Humans have evolved specialized skills of social cognition: The cultural intelligence Hypothesis. *Science* 317: 1360-1366.

Dean, L. G., Kendal, R. L., Schapiro, S. J. & Laland, K. N. (2012). Identification of the social and cognitive processes underlying human cumulative culture. *Science* 335: 1114-1118.

de Waal, F. B. M. (2012). The antiquity of empathy. *Science* 336: 874-876.

de Waal, F. B. M. (2008). Putting the altruism back into altruism: The evolution of empathy. *Annual Review of Psychology* 59: 279-300.

Evolutionary Psychology

Haidt, J. & Kesebir, S. (2010). Morality. In S. Fiske, D. Gilber & G. Lindzey (eds.), *Handbook of Social Psychology*, pp 797-832.

Daly, M. & Wilson, M. (1999). Human evolutionary psychology and animal behaviour. *Animal Behaviour* 57: 509–519.

Smith, E. A., Borgerhoff Mulder, M. & Hill, K. (2000). Evolutionary analyses of human behaviour: A commentary on Daly & Wilson. *Animal Behaviour* 60: F21-26.

Integrative Approaches

Dioniak, S. M., French, J. A. & Holekamp, K. E. (2006). Rank-related maternal effects of androgens on behaviour in wild spotted hyaenas. *Nature* 440: 1190-1193.

Kotrschal, A. et al (2013). Artificial selection on relative brain size in the guppy reveals costs and benefits of evolving a larger brain. *Current Biology* 23: 1-4.

Zanette, L. Y., White, A. F., Allen, M. C. & Clinchy, M. (2011). Perceived predation risk reduces the number of offspring songbirds produce per year. *Science* 334: 1398-1401.

Fernald, R. D. and Karen P. Maruska. (2012). Social information changes the brain. *Proceedings of the National Academy of Sciences* 109: 17194–17199.

van Oers, K., Piet J. Drent, P. J., de Goede, P. & van Noordwijk, A. J. (2004). Realized heritability and repeatability of risk-taking behaviour in relation to avian personalities. *Proceedings of the Royal Society B* 271: 65-73.

Glocker, M. L. et al. (2009). Baby schema modulates the brain reward system in nulliparous women. *Proceedings of the National Academy of Sciences* 106: 9115-9119.

Musso, M. et al. (2003). Broca's area and the language instinct. *Nature Neuroscience* 6: 774-781.

Statements for Syllabi and Blackboard Pages

Students should visit <http://go.vcu.edu/syllabus> and review all syllabus statement information. The full university syllabus statement includes information on safety, registration, the VCU Honor Code, student conduct, withdrawal and more.