

Evolution of Social Complexity

Spring 2021

Meeting Time and Place	Tues/Thurs <i>TBD</i> <i>TBD</i>
Instructor	Dr. Catherine Markham <i>Email:</i> catherine.markham@stonybrook.edu <i>Phone:</i> (631) 632-5755 <i>Office:</i> Social and Behavioral Sciences Building, Room North-533 <i>Office hours:</i> <i>TBD</i>
Undergrad TA	TBD <i>Email:</i> <i>TBD</i> <i>Office:</i> Social and Behavioral Sciences Building, room South-524 <i>Office hours:</i> <i>TBD</i>
Course Attributes	STEM+; DEC E
Prerequisites	ANP 120 <i>or</i> BIO 201 <i>or</i> instructor permission

Course Description

An in-depth examination of how and why social animals establish and maintain relationships with one another, especially in large and fragmented societies. Applying the principles of evolutionary biology and behavioral ecology, this course explores: group structure and stability; conflicts and coalitions; theory of mind and social learning; and culture and communication. Current research on group-living mammals, particularly non-human primates and human populations, is emphasized.

Course Learning Objectives

1. **Make** predictions about social behavior based on an individual's environment.
2. **Discover** the role that behavioral flexibility plays in maximizing individual fitness.
3. **Develop** novel hypotheses about social behavior using an evolutionary framework.
4. **Critically evaluate, synthesize, and extract** key elements of scientific arguments.
5. **Gain intellectual independence** by debating primary literature, interpreting data, and critiquing experimental design.

Course Delivery Mode and Structure

This course includes two lecture/seminar sessions each week. PowerPoint slides will be posted on Blackboard *after* each lecture/seminar. **Note that many lecture slides, however, are simply pictures – students are often not able to understand the material that was discussed unless they are present for lecture!**

How We Will Communicate

I cannot always recognize the confused, frustrated, or unhappy expressions on your face if you encounter problems, so you must communicate with me so that I can help! To make the experience go smoothly, remember that you're responsible for initiating contact and being direct, persistent, and vocal when you don't understand something.

For personal/private issues, my preferred method of contact is via email at catherine.markham@stonybrook.edu. If you would like to talk on the phone or meet, email me so that we can set up a mutually agreeable time. I will reply to your emails as soon as possible, but please allow between 24-48 hours for a response. Also, please use your Stony Brook University email when getting in touch with me as that is the preferred method of contact from the institution.

Blackboard and Technical Assistance

This course uses Blackboard to facilitate communication between the instructor and students, taking quizzes, assignment submission, and grade posting. The Blackboard course site can be accessed at <https://blackboard.stonybrook.edu>. If you are unsure of your NetID, visit <https://it.stonybrook.edu/help/kb/finding-your-netid-and-password> for more information.

It is your responsibility to secure use of a reliable computer and internet connection throughout the term. Note that you will be at a disadvantage if you attempt to complete all coursework on a smart phone or tablet and it may in fact be impossible to submit the files required for your assignments. The following list details a minimum recommended computer set-up and the software packages you will need: PC with Windows 8 or Macintosh with OS 10.11; Intel Core i5; 250 GB hard drive; 8 GB RAM; high speed internet connection; word processing software; speakers (either internal or external) or headphones; and Adobe Flash player with the latest update.

If you need technical assistance at any time during the course or to report a problem with Blackboard you can call Stony Brook University Client Support at (631) 632-9800. You can also submit a help request ticket online at <https://it.stonybrook.edu/services/itsm> and/or you can visit Stony Brook University's Walk-Up Tech Support Station in the Educational Communications Center Building.

Required Readings

Readings for this course come from the following book as well as peer-review journal articles. Journal articles will be made available as pdfs on Blackboard.

de Waal FBM. 2016. Are We Smart Enough to Know How Smart Animals Are? W.W. Norton and Company, Inc.: New York, NY.

Assessment and Evaluation

Attendance: You are expected to attend each class and you are expected to arrive on time. Students arriving late to lecture will be marked as absent. If an absence is planned, you must notify me before the day of the missed class. If the absence is not planned, you must contact me (preferably by email) on the day of the absence before 5:30pm and be prepared to follow-up with written evidence justifying the absence (e.g. a doctor's note). I will verify your documentation with the provider. Unexcused absences will result in points deducted from your class attendance and participation grade.

Participation: I expect you to demonstrate your understanding of the material by responding to questions I ask during class or by asking relevant questions yourself (particularly if you do not understand the material). You should be prepared to discuss the readings assigned for that day, meaning you must complete those readings *before* class. You should work with your fellow students during in-class assignments.

Fish Bowl Discussions: Over the course of the semester, we will read and discuss research articles on various aspects social behavior. For several of these articles, groups of 4-6 students take part in a "fish bowl presentation" at the front of the classroom. These discussions allow students an opportunity to discuss the article in a small-group setting while the rest of the class listens to the conversation. While

you may feel some pressure, I want to emphasize that my goal is *never* to make a student feel criticized under a microscope! Instead, I want you to experience how academics at all stages of our career – including established professors – sometimes struggle to understand even the most well-written of journal articles. This challenge is natural and you should embrace it and work with others to resolve any questions. Students participating in the fish bowl are expected to: (1) discuss the study's motivation and conclusions; (2) critically evaluate the study, addressing any concerns about the study's design, analysis, etc.; and (3) set the article in the context of our course. *Student groups will be determined at the start of the semester, so you will have time to prepare.* A grading rubric for these discussions is provided on Blackboard. *Students should expect to be take part in at least two fish bowl discussions over the course of the semester.*

Article Review: You will choose a primary literature article that is *not* on the syllabus but is related to material covered in the course and submit an article review at the end of the term. The article must come from one of the following journals: *Science, Nature, Proceedings of the National Academy of Sciences, Proceedings of the Royal Society B, Animal Behavior, Animal Cognition, Behavioral Ecology, or Behavioral Ecology and Sociobiology* and have been published in the year 2010 or later. This assignment is meant to help ensure you are a critical reader of scientific articles. A grading rubric is on Blackboard and you must get your article approved by me by **Mar 28**. Your final article review is due on **Apr 11**. *Late work will not be accepted.*

Exams: You will take two exams, both of which will be held during regular lecture time and in our regular classroom. The first exam will be held on **Mar 5** and the second exam will be held on **May 9**. These exams may consist of any or all of the following types of questions: multiple choice, true/false, fill-in-the-blanks, matching, and/or short answer. Any questions concerning your exam grade must be brought to my attention within one week of the graded exam's return. After one week, we can discuss your exam but re-grades will not be considered.

On exam days, students are not permitted to wear hats or use electronic devices. Any use of a cell phone or other unauthorized electronic device during an examination will lead to an accusation of scholastic dishonesty. Also note that all backpacks, book bags, purses, etc. must be left at the front of the classroom during exams. You need only a pen or pencil to take an exam. If you're worried that someone might take your bag by mistake, don't bring it to class on an exam day.

Students seeking exam accommodations through the Student Accessibility Support Center (SASC) are responsible for coordinating taking the exam at SASC at least one full week prior to the exam date. To avoid confusion, students should email me to confirm that I am aware of this testing location. For more information on SASC, visit them online at <https://www.stonybrook.edu/dss/>

Make-up Exams: Make-up exams will be given only under exceptional circumstances and only if the student can provide written evidence for the cause of their absence. For planned absences, you must provide this documentation in advance of the exam date and time. For unplanned absences, students must contact me (either by email or voicemail) no later than the 5:30pm on the date of the exam. Make-up exams will be given for students missing the exam for official University functions. *The make-up exam will be different from the regular exam with increased emphasis on short answer and essay questions.*

Grading: This course is a 3-credit course. Students will receive a grade between A and F based on their class attendance and active participation, fish bowl discussions, article review, and two exams according to the following calculations:

<i>Attendance</i>	10%
<i>Participation</i>	10%
<i>Fish Bowl Discussions</i>	20%
<i>Article Review</i>	10%
<i>Exam 1</i>	25%
<i>Exam 2</i>	25%

Your final letter grade for the semester will be assigned based on the following ranges. Note that there no “extra credit” offered for this course and that grades are not curved.

A	93 to 100	B+	87 to <90	C+	77 to <80	D+	67 to <70
A-	90 to <93	B	83 to <87	C	73 to <77	D	63 to <67
		B-	80 to <83	C-	70 to <73	F	0 to <63

Struggling students: If you are struggling in class, please come to me *during* the semester. Do not wait until the end of the semester to ask for help! By then it is too late for me to help you. If your performance during the semester is adversely affected by personal problems (death of a family member, mental health issues, etc.), contact your dean’s office as soon as possible to discuss your options. Other available resources for academic help include Student Success Resources (<http://www.stonybrook.edu/for-students/> and <http://www.stonybrook.edu/due>) as well as the Academic Success and Tutoring Center (http://www.stonybrook.edu/commcms/academic_success/).

Use of Electronics

Ringling phones, texting, etc. are disruptive so remember to turn off your phone before you come to class. You can use your computers in class for note-taking and other purposes related to this class. However, you will lose that privilege if you use your computer for other purposes during class.

Our Online Community

This course uses *optional* Discussion Boards on Blackboard to promote an exchange of ideas among peers. Our online classroom – just like our physical classroom – is a professional environment where academic debate and learning take place. I will make every effort to make this environment safe for you to share your opinions, ideas, and beliefs. In return, you are expected to respect the opinions, ideas, and beliefs of other students and adhere to the standards set in the Student Code of Conduct. Students who violate these standards are subject to disciplinary action. If your behavior does not follow the course etiquette standards stated below, I reserve the right to remove any discussion messages that display inappropriate language or content.

I expect all students to respect the following guidelines for postings:

- Offensive language or rudeness will not be tolerated. Discuss ideas, not the person.
- Avoid cluttering your messages with excessive emphasis (stars, arrows, exclamations).
- Be specific and clear, especially when asking questions.
- Be forgiving of other people’s mistakes.
- Use standard punctuation and capitalization. Using all uppercase characters can give the appearance of shouting and makes the message less legible.
- Remember that not all readers are native English speakers, so make allowances for possible misunderstandings and unintended discourtesies.

Within our online community, I will serve as a “guide” to our online discussions. While I will not respond to every post, I will read what is posted and reply when necessary. Expect instructor posts in the following situations:

- To assist each of you when it comes to making connections between discussion, lectures, and textbook material.
- To fill in important things that may have been missed.
- To re-direct discussion if discussions get “out of hand”.
- To identify key points or especially valuable posts.

Student Accessibility Support Center Statement

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Student Accessibility Support Center, ECC (Educational Communications Center) Building, Room 128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Academic Integrity Statement

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person’s work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at

http://www.stonybrook.edu/commcms/academic_integrity/index.html

Critical Incident Management

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students’ ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

Course Evaluations

Each semester, Stony Brook University asks students to provide feedback on their courses and instructors through an online course evaluation system. The course evaluation results are used by the individual faculty, department chairs and deans to help the faculty enhance their teaching skills and are used as part of the personnel decision for faculty promotion and tenure.

Stony Brook contracts with an outside vendor to administer the surveys and all results are completely anonymous. No individually identifiable data are ever reported back to the university or instructor. Students who have completed previous evaluations can view all faculty ratings at

<https://www.stonybrook.edu/celt/services/assessment/course/course-evaluations>

Copyright Notice

Unless otherwise noted, all materials in this course are the intellectual property of the professor and you may not reuse and/or duplicate the material in printed or electronic form without prior written permission from the owner. The University requires all members of the University Community to familiarize themselves and to follow copyright and fair use requirements. YOU ARE INDIVIDUALLY AND SOLELY RESPONSIBLE FOR VIOLATIONS OF COPYRIGHT AND FAIR USE LAWS. THE UNIVERSITY WILL NEITHER PROTECT NOR DEFEND YOU NOR ASSUME ANY RESPONSIBILITY FOR EMPLOYEE OR STUDENT VIOLATIONS OF COPYRIGHT AND FAIR USE LAWS. Violations of copyright laws could subject you to

federal and state civil penalties and criminal liability as well as disciplinary action under University policies.

Course Schedule

See below for key dates. Note that dates are subject to change!

MODULE 1: GETTING STARTED

- Jan 29 **Building a society**
No reading
- Jan 31 **Studying animal behavior**
Alberts SC. 2016. The challenge of survival for wild infant baboons. *American Scientist* 104:366-373.
Origin Stories Podcast: [How to document a society](#) (16 min)

MODULE 2: RECOGNITION

- Feb 5 **Self-recognition**
Bekoff M, Sherman PW. 2004. Reflections on animal selves. *TRENDS in Ecology and Evolution* 19:176-180.
de Waal FBM. 2019. Fish, mirrors, and a gradualist perspective on self-awareness. *PLoS Biology* 17:e3000112.
- Feb 7 **Recognizing others**
Buchan JC, Alberts SC, Silk JB, Altmann J. 2003. True paternal care in a multi-male primate society. 2003. *Nature* 425:179-181.
Rosenbaum S, Hirwa JP, Silk JB, Vigilant L, Stoinski TS. 2015. Male rank, not paternity, predicts male-immature relationships in mountain gorillas, *Gorilla beringei beringei*. *Animal Behaviour* 104:13-24.

MODULE 3: SOCIAL INTERACTIONS

- Feb 12 **Prosocial behaviors**
Archie EA, Tung J, Clark M, Altmann J, Alberts SC. 2014. Social affiliation matters: Both same-sex and opposite-sex relationships predict survival in wild female baboons. *Proceedings of the Royal Society B* 281:20141261.
McFarland R, Murphy D, Lusseau D, Henzi SP, Jessica L, Parker JL, Pollet TV, Barrett L. 2017. The “strength of weak ties” among female baboons: Fitness-related benefits of social bonds. *Animal Behaviour* 126:101-106.
Optional:
Silk, JB. 2007. Social components of fitness in primate groups. *Science* 317:1347-1351.
- Feb 14 **Ontogeny of prosocial behaviors**
House BR, Silk JB, Henrick J, Barrett HC, Scelza BA, Boyette AH, Hewlett BS, McElreath R, Laurence S. 2013. Ontogeny of prosocial behavior across diverse societies. *Proceedings of the National Academy of Sciences* 110:14586-14591.
Stanton MA, Gibson QA, Mann J. 2011. When mum’s away: A study of mother and calf ego networks during separations in wild bottlenose dolphins (*Tursiops* sp.). *Animal Behaviour* 82:405-412.

- Feb 16 **Cooperation**
 Cameron EZ, Setsaas TH, Linklater WL. 2009. Social bonds between unrelated females increase reproductive success in feral horses. *Proceedings of the National Academy of Sciences* 106:13850-13853.
 Crockford C, Wittig RM, Langergraber K, Ziegler TE, Zuberbühler K, Deschner T. 2013. Urinary oxytocin and social bonding in related and unrelated wild chimpanzees. *Proceedings of the Royal Society B* 280:20122765.
- Feb 19 **Competition and aggression**
 Huchard E, English S, Bell MBV, Thavarajah N, Clutton-Brock T. 2016. Competitive growth in a cooperative mammal. *Nature* 533:532-534.
 Surbeck M, Mundry R, Hohmann, G. 2010. Mothers matter! Maternal support, dominance status and mating success in male bonobos (*Pan paniscus*). *Proceedings of the Royal Society B* 278:590-598.
- Feb 21 **Reconciliation – Part 1**
 Baan C, Bergmüller, Smith DW, Molnar B. 2014. Conflict management in free-ranging wolves, *Canis lupus*. *Animal Behaviour* 90:327-334.
 Webb CE, Baniel A, Cowlshaw G, Huchard E. 2019. Friend or foe: Reconciliation between males and females in wild chacma baboons. *Animal Behaviour* 151:145-155.
- Feb 26 **Reconciliation – Part 2**
 Casey K, Glennerster R. 2016. Reconciliation in Sierra Leone. *Science* 352:766-767.
- Feb 28 *TBD*

Mar 5 **Exam 2**

MODULE 4: COGNITION

- Mar 7 **Cognition – Part 1**
 Loukola OJ, Perry CJ, Coscos L, Chittka L. 2017. Bumblebees show cognitive flexibility by improving on an observed complex behavior. *Science* 355:833-836.
 Pltonik JM, de Waal FBM. 2014. Extraordinary elephant perception. *Proceedings of the National Academy of Sciences* 111:5081-5072.
- Mar 12 **Cognition – Part 2**
 Amici F, Aureli F, Call J. 2008. Fission-fusion dynamics, behavioral flexibility, and inhibitory control in primates. *Current Biology* 18:1415-1419.
 Hare B, Call J, Tomasello M. 2001. Do chimpanzees know what conspecifics know? *Animal Behaviour* 61:139-151.
- Mar 14 **Canine cognition**
 Hare B, Tomasello M. 2005. Human-like social skills in dogs? *TRENDS in Cognitive Sciences* 9:439-444.

Mar 19 Spring break

Mar 21 Spring break

MODULE 5: GROUP-LEVEL PHENOMENA

Mar 26 **Intergroup interactions**

- Crofoot MC. 2013. The cost of defeat: Capuchin groups travel further, faster and later after losing conflicts with neighbors. *American Journal of Physical Anthropology* 152:79-85.
- Boesch C, Crockford C, Herbinger I, Wittig R, Moebius Y, Normand E. 2008. Intergroup conflicts among chimpanzees in Taï National Park: Lethal violence and the female perspective. *American Journal of Primatology* 70:519-532.

Mar 28 **Collective animal behavior**

- Strandburg-Peshkin A, Papageorgiou, Crofoot MC, Farine DR. 2018. Inferring influence and leadership in moving animal groups. *Philosophical Transactions of the Royal Society B* 373: 20170006.
- Smith JE, Estrada JR, Richards HR, Dawes SE, Mitsos K, Holekamp KE. 2015. Collective movements, leadership, and consensus costs at reunions in spotted hyaenas. *Animal Behaviour* 105:187-210.

Deadline for getting an article approved for the article review!

MODULE 6: SOCIAL LEARNING, COMMUNICATION, AND CULTURE

Apr 2 **Communication**

- Fitzsimmons LP, Bertram SM. 2013. Playing to an audience: The social environment influences aggression and victory displays. *Biology Letters* 9:20130449.
- Slocombe KE, Zuberbühler K. 2007. Chimpanzees modify recruitment screams as a function of audience composition. *Proceedings of the National Academy of Sciences* 104:17228-17233.

Apr 4 **Social learning, teaching, and conformity**

- Cornell HN, Marzluff JM, Pecoraro S. 2011. Social learning spreads knowledge about dangerous humans among American crows. *Proceedings of the Royal Society B* 279:499-508.
- Thornton A, McAuliffe K. 2006. Teaching in wild meerkats. *Science* 313:227-229.

Apr 9 **Culture – Part 1**

- Sapolsky RM, Share LJ. 2004. A pacific culture among wild baboons: Its emergence and transmission. *PLoS Biology* 2:294-304.
- Whiten A, van Schaik CP. 2007. The evolution of animal “cultures” and social intelligence. *Philosophical Transactions of the Royal Society B* 362:603-620.

Apr 11 **Culture – Part 2**

- Lamon N, Neuman C, Gruber T, Zuberbuhler K. 2015. Kin-based cultural transmission of tool use in wild chimpanzees. *Science Advances* 3:e1602750.
- Luncz LV, Wittig RM, Boesch C. 2015 Primate archaeology reveals cultural transmission in wild chimpanzees (*Pan troglodytes verus*). *Philosophical Transactions of the Royal Society B* B370:20140348.

Article review due!

MODULE 7: COMING FULL CIRCLE

- Apr 16 **Are we smart enough to know how smart animals are? – Part 1**
Chapters 1 and 2
- Apr 18 **Are we smart enough to know how smart animals are? – Part 2**
Chapters 3 and 4
- Apr 23 **Are we smart enough to know how smart animals are? – Part 3**
Chapters 5 and 6
- Apr 25 **Are we smart enough to know how smart animals are? – Part 4**
Chapters 7, 8, and 9
- May 2 **Conclusions**
Bergman TJ, Beehner JC. 2015. Measuring social complexity. *Animal Behaviour* 103:203-209.
- May 7 *TBD*
- May 9 **Exam 2**