

Evolution of Communication: from Animal Signals to Human Speech

Final Year Module, Spring term
Module code: C8600

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EVOLUTION OF COMMUNICATION 2017

Module Convenor: Prof Karen McComb

Module Outline

This new module will explore the evolution of communication, progressing from the vocal signals that animals produce and the functions they serve, to then consider the differences between animal vocal communication and human speech and evaluate theories of language evolution. In the course of this we will also examine ape language studies and explore gestural communication. The teaching will combine lectures with interactive research workshop sessions and practical demonstrations in order to expose students to tools and skills that would allow them to conduct research in this area themselves. It should very much appeal to both psychologists and biologists interested in how vocal signals provide the basis for animal sexual and social behaviour, the evolution of communication, the question of whether any animal can be said to have a language, and the production and perception of human speech.

Learning outcomes

By the end of the module, a successful student should be able to:

1. Explain the essentials of how animal vocalisations are produced, what information they contain, and how they function in mediating sexual and social behaviour.
2. Report differences between animal and human communication and explain unique properties of human speech.
3. Critically assess empirical evidence, core concepts and current controversies in the field of animal communication and evaluate competing theories of language evolution.
4. Illustrate a practical knowledge of how to undertake research on animal communication and human speech.

Module Assessment

In assessing your performance on the module we are trying to determine both whether you have grasped the essential subject matter and whether you can think about and synthesise it in an original way. Your marks will be based on:

- 1) A short oral presentation that is delivered in weeks 9 or 10, counting for 20% of the course mark.
- 2) An extended essay of 3,000 words in length that will count for 80% of the course mark (A2).

Assessment information

Assessments deadlines and methods of submission can be found on your assessment timetable via Sussex Direct.

Information on the following can be found at the link below:

- Submitting your work
- Missing a deadline
- Late penalties
- Exceptional circumstances
- Exams
- Help with managing your studies and competing your work
- Assessment Criteria

<http://www.sussex.ac.uk/psychology/internal/students/examinationsandassessment>

Attendance, absence and Engagement

You are expected to be 'in attendance' at the University for the full duration of the published term dates for your course of study. That means you should be regularly attending lectures, seminars, labs etc. and committing time to your studies to be in a position to comply with academic and administrative expectations.

The university has an 80% attendance policy in place, so it's really important that you let us know if you are ill or cannot attend classes so that we can register this as a notified absence.

If you are unable to attend your seminars or workshops, you need to send an email to psychologyabsence@sussex.ac.uk setting out the following information:

- Seminar(s) / workshop(s) that you will be absent from (list all of them)
- Tutor name
- Brief reason for absence

Please see the following link for further information:

<http://www.sussex.ac.uk/psychology/internal/students/attendance>

General Aims of Module

The three main components of the module (the lectures, the practical demonstrations and the workshop sessions) have complementary aims. In the lectures we will give you a good grounding in the subject area and introduce you to the research methods used. The practical demonstrations will then provide you with hands-on experience of methodology used in some of the studies you have been hearing about in lectures, specifically enabling you to see how spectral analysis can be used to examine the acoustic structure of vocalisations, compare different animal groups with an understanding of the underlying reasons for the differences, and make comparisons between animal vocalisations and human speech. The workshop sessions add a further important layer to your skills – they are designed to teach you how the research you've been hearing about in lectures is actually achieved. These will tackle research problems from first principles such that you will learn where the questions come from in the first place, and see how hypotheses are formulated and tested. In the workshop sessions you will also be given the opportunity to formulate and test your own hypotheses. As well as the formal teaching sessions described above, you will be giving your own oral presentations on key research papers and listening to your classmates doing the same. This is an extra opportunity to learn about new studies and research methods and should be a very stimulating and rewarding addition to the module.

Specific Objectives

By the end of the module you should have an in depth knowledge of the topics listed in the module schedule and a good grasp of how to go about doing research on the evolution of communication yourself. You will be asked to do a significant amount of independent reading to explore the issues raised in lectures and we emphasise the importance of consulting original journal articles when doing this. Learning to sift through papers and extract the main points is an important study skill. In your reading you will be expected to critically evaluate the information you are exposed to, and to formulate your own reasoned opinions in subject areas where controversies exist. The workshop sessions will give you further opportunities to develop skills for abstracting and evaluating information, but here you will also be given experience of presenting your ideas orally to your class-mates and of discussing them. Critically, in these sessions you will also learn how to problem-solve. While we will focus on teaching you to approach research problems by systematically formulating hypotheses and conducting well-designed experiments, problem solving and working as part of a co-ordinated group are general skills that will help you in whatever career you choose. In the oral presentations that you will give as part of the formal assessment you will develop your evaluation and communication skills further and learn from your classmates as they do the same. Finally, the practical demonstrations will teach you how to use some of the techniques that are basic to research on vocal communication.

OUTLINE TIMETABLE

LECTURE SLOT SCHEDULE

Introduction to the module & evolution of vocal signalling

Week 2

Communication in birds 1: sexual signalling

Week 3

Communication in birds 2: social signalling

Week 4

Communication in mammals 1: sexual signalling

Week 5

Communication in mammals 2: social signalling

Week 6

Language-like abilities in animals

Week 7

Ape Language Studies

Week 8

Gestural Communication in Apes

Week 9

Human speech compared with animal vocal communication

Week 10

Student research presentations (in timetabled lecture slot)

Week 11

Theories of Language Evolution

Week 12

Revision session / discussion of essay assignments

OTHER SCHEDULED SESSIONS (2hrs each)

Week 5 Lab session examining animal vocalisations

Week 6 Problem solving WORKSHOP 1

Week 7 BBC Films: 'Talk to the animals'

Week 9 Problem solving WORKSHOP 2

Week 9 Student research presentations (in timetabled film slot)

Week 10 Lab session examining human speech

Week 10 Student research presentations (in timetabled workshop slot)

READING MATERIAL FOR EVOLUTION OF COMMUNICATION MODULE

Recommended textbooks (in approximate order in which they will appear in the module):

Suthers, R. A., Fitch, W. T., Fay, R. R., & Popper, A. N. 2016. *Vertebrate Sound Production and Acoustic Communication* (Vol. 53). Springer.

Titze, I.R. 1994. *Principles of vocal production*. Prentice Hall.

Bradbury, J. W. & Vehrencamp S. L. 2011 *Principles of Animal Communication* Sunderland, Mass.: Sinauer.

Davies, N.B., Krebs, J.R. & West, S.A. 2012. *An Introduction to Behavioural Ecology* 4th Edition. Blackwell.

Searcy, W.A & Nowicki, S. 2005. *The Evolution of Animal Communication: Reliability and Deception in Signaling Systems: Reliability and Deception in Signaling Systems* (Monographs in Behavior and Ecology). Princeton University Press, Princeton, New Jersey.

Catchpole, C. K. & Slater, P.J.B. 2008. *Bird Song: biological themes and variations* Cambridge: C.U.P.

Clutton-Brock, T. 2016. *Mammal Societies*. Wiley Blackwell.

Cheney, D.L. & Seyfarth, R.M. 1990. *How Monkeys See the World*. University of Chicago Press.

Cheney D.L. & Seyfarth R.M. 2007. *Baboon Metaphysics: the evolution of a social mind* University of Chicago Press.

Hillix, W. A., & Rumbaugh, D. M. 2004. *Animal Bodies, Human Minds: Ape, Dolphin, and Parrot Language Skills*. Springer.

Pina, M., & Gonter, N. (Eds.). 2014. *The Evolution of Social Communication in Primates: A Multidisciplinary Approach*. Springer.

Fitch W.T. 2010. *The Evolution of Language*. Cambridge University Press.

Kreiman, J., & Sidtis, D. 2011. *Foundations of voice studies: An interdisciplinary approach to voice production and perception*. John Wiley & Sons.

More specialised texts / original journal articles will be recommended for specific topics in lectures and these form the core reading.