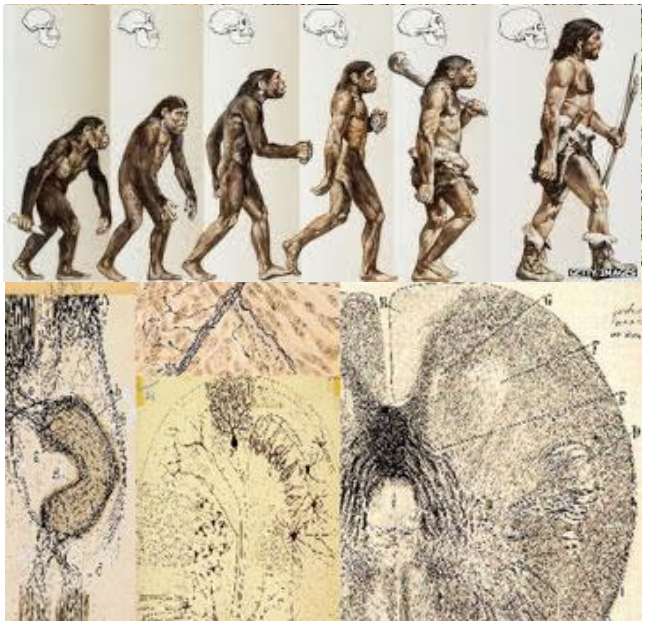
University of Sussex

Psychobiology(C8003)



1st year
15 Credits
Spring Term 2016/17

Module Convenor:

Dr. Catherine Hall
School of Psychology
The University of Sussex

Module Structure Aims & Objectives

Psychobiology combines the traditional research fields of Behavioural Neuroscience, or Physiological Psychology, with Evolutionary Psychology & Animal Behaviour (Comparative Psychology). The behavioural neuroscience aspect of the module explores how brain processes cause psychological processes and behaviour and, in turn, how psychological experiences are encoded in the brain. The evolutionary aspect of the module is concerned with how psychological processes have evolved by examining how human psychology compares with psychological processes in other (non-human) animals. In doing so, the module covers those areas of Biological Psychology that are recognised by the British Psychological Society (BPS) as essential (core) elements of a psychology degree and meet the requirements for the Graduate Basis for Registration with the BPS.

This 15-credit module surveys a range of topics including behavioural evolution, brain structure and function, neuronal structure, function and synaptic transmission, emotion and motivation, learning and memory and cognition. The module is designed to provide a broad overview of biological and evolutionary psychology aimed at UG students who have some psychology background but who, other than some basic familiarity with biology (high school or introductory university levels), have yet to take a dedicated module in biological psychology. The module serves as an essential introduction to the 2nd year module Brain & Behaviour.

Contact Information

- Dr Catherine Hall (**CH**) – Module convenor and lecturer. Room 5.15 in CRPC, tel: 8914, email: catherine.hall@sussex.ac.uk
- Professor Pete Clifton (**PC**) - Lecturer. Room 5.13 in CRPC 1, email: p.g.clifton@sussex.ac.uk
- Dr Hans Crombag (**HSC**) – Lecturer. Room 5.16 in CRPC, tel: 8059, email: h.crombag@sussex.ac.uk
- Professor Karen McComb (**KM**) – Lecturer. Room 2B9 in Pev.1, Email karenm@sussex.ac.uk
- Professor Martin Yeomans (**MY**) – Practical tutor, Room 1C4 Pevensey 1, tel: 8617, email: martin@sussex.ac.uk

Teaching

Lectures. There are 2 x 1 hr lectures per week and the times and location are available through your Sussex Direct timetable. Page 7 of this handbook gives a listing of the lecture topics. To avoid disruption at the start of the lecture, you must arrive at least 5 minutes before the start time of the lecture (see lecture attendance etiquette in Psychology course handbook).

Seminars. There are 3 seminars for this module which will last for one ‘teaching hour’ each and occur in specified weeks (weeks 3, 8 and 11). You will be allocated to a particular group so check your timetable on Sussex Direct for details about *when* and *where* your seminars are held. Additionally, full details about the seminar content, readings and required preparation exercises are given at the end of this handbook and on Study Direct.

Practical. There will be one 2-hr practical session relating to the learning and memory (and motivation) sections of the module. The practical is taught in small groups in the Psychology practical laboratory in week 7 by Professor Martin Yeomans, assisted by your tutors. Details about the time and location for the practical will be available in your Sussex Direct timetable.

Further details about the practical structure and content are given at the end of this handbook.

IMPORTANT: It is essential that you attend ALL lectures, seminars and the practical. In the latter case especially since the lab report is based on the data you'll collect during the practical session. But also, attending the lectures and seminars will ensure that you are maximally engaged with the materials. Though we record all lectures, you should not take this to mean that you can readily skip lectures and catch up by listening to the recordings. First, because the temptation will be to catch up 'at a later date', i.e., just before the exam when it matters most; but in that case you will fall behind during the term and have a much more difficult time comprehending and integrating the subsequent lectures. Second, because listening at lectures 'at home' is much less likely to grab and hold your attention then when you are physically present and listening. How well you do in this (or any) module during your studies is directly related to how frequently, consistently and attentively you engage with the materials. This is one of the most consistent findings in the field of educational psychology and is furthermore supported by a wealth of evidence about how learning and memory occur. Certainly, 'cramming' for your exams works to a degree, but always attending your lectures and seminars, self-studying *consistently* (before and/or after each lecture), reading the textbook and other assigned materials (and especially finding additional sources of information yourself) will avoid you a lot of 'headache' and help you do well in this and future modules. And keep in mind that, the information from the Psychobiology module is directly relevant to many modules you will take (e.g., Brain and Behaviour) or are likely to take (e.g., Drugs, Brain and Behaviour, Neurobiology of Mental Disorders) in your 2nd and final year.

Study Direct

All the critical module materials will be provided through the module's Study Direct site, including the lecture handouts, lecture recordings and seminar readings. The lecture slides are available for downloading the day before the actual lecture meeting so you are able to print these prior to attending the lectures.

One of the best ways to share ideas amongst your fellow students and ask questions about the module is through the Study Direct Forum. The module convenor will monitor the Forum and, if necessary, answer specific questions that have not been addressed by fellow students, correct and/or add to ongoing discussions. But, to encourage discussion between the students, the convener will wait for the students to engage in discussion first, especially if a question has already been answered on the forum.

Textbook and Readings

A full reading list of essential and recommended readings for the different parts of this module (lectures, seminars, practical etc.) is clearly linked to on Study Direct, as well as being available from the library.

The principle textbook for this module is Bryan Kolb & Ian Whishaw (2011) *An Introduction to Brain and Behavior, 4th edition*, or the 5th edition, with G. Campbell Teskey (2016) *(Worth Publishers, New York, NY, USA).* The library has several copies of the older version and is getting copies of the latest edition, but it may be worth you buying this text as it serves as the core text, not only for Psychobiology, but also for your 2nd year core module *Brain &*

Behaviour (C8518). The book is available at the Campus Bookstore as part of the 'book bundle'. Note that there the text has a good company website with sample quizzes, flashcards, and other information: http://bcs.worthpublishers.com/kolbintro4e/#t_824272.

Because there is not one single textbook available that is directly relevant to the Evolution & Psychology part of the module, a number of essential and recommended readings are included on the reading list (see Study Direct)

Assessment

The module is assessed by a combination of coursework (40%) and 1 (Multiple Choice) Unseen examination (60%) that is taken towards the end of the academic year (date and time of the final exam will be announced).

1. Module course work (40% contribution to final mark). The course work part of your assessment consists of Computer based exam (3 online quizzes), 1 (Lab) Report and 1 (short) Essay.

Computer based exam- (Online quizzes) - Study Direct. There are three on-line quizzes that will assess your knowledge and understanding of lecture materials. The quizzes are available for completion via the module Study Direct website and the completion deadline for each quiz is 1 week after the quiz becomes available. The first quiz covers 'Brains, neurons and signalling' and is based on the essential reading for the first four lectures. The second quiz covers all of the content from the lectures on synapses, learning & memory, motivation, and theoretical and neurobiological accounts of emotion. Finally, the third quiz assesses your understanding of the animal behaviour & evolutionary psychology portion of the module.

Your final mark for the quizzes will be the average mark of the 2 highest quiz results (i.e., your lowest quiz mark will be excluded). The quiz mark will account for 10% of your final module mark. The opening (and closing) dates for each quiz will be announced in the lectures.

(Lab) Report (1500 words) - e-submission via Study Direct: The 2nd piece of coursework assessment consists of a lab report relating to the practical (Sniffy the rat). This lab report contributes 50% of your coursework assessment and thus 20% of the overall module assessment. *Note that attendance of the practical session is essential for writing of the lab report and for completing the assessment*.

Essay (1000 words) - e-submission via Study Direct: The 3rd piece of coursework assessment consists of a short (1000 word) essay on a topic selected from the list of 4 topics provided at the end of the handbook. This essay contributes 25% of your coursework assessment and thus 10% of the overall module assessment.

2. (Multiple Choice) Unseen examination (60% contribution to final mark). The final examination paper taken at the end of the module year consists of 50 multiple-choice questions covering the full range of module content. Examination details and timetables are displayed on the exam notice board on the Pevensey 1 upper mezzanine and on Sussex Direct. The School Office will not give out details of individual exam times.

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

A variety of assessment modes are used to develop and test different types of knowledge, skills and aptitudes. The assessment modes have been approved to test the course and module learning outcomes. Written submissions usually form an integral part of assessment at all levels. Written submissions include essays, reports, logs etc as appropriate to the module and the skills that you are being expected to develop. Examinations usually focus more on your ability to use your knowledge of the subject, rather than simply testing your memory for facts. Feedback is provided to support you in future assessments.

Unseen examinations are typically used to assess your level of knowledge and/or understanding of the discipline without the support of textbooks, notes or internet resources, unless these have been specifically permitted by the examination rubric. For students registered with the Student Support Unit an alternative mode may be approved as a Reasonable adjustment with the Student Support Unit.
However, when, in accordance with the academic judgement of the School, where an unseen exam has been approved for a module to assess competence standards, learning outcomes and any accreditation requirements, an alternative mode may not be approved as a Reasonable Adjustment for a student registered with the Student Support Unit. If you have any concerns, please discuss these with the Student Support Unit, who will liaise with the school.

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

Module Evaluation

The module convenor will create opportunities for you to provide feedback (online, on paper, and/or in person) on your experience of the module during the term. In addition, you will be asked to complete an online course evaluation questionnaire at the end of every term, and this will provide an opportunity for you to comment on each module as well as the course overall.

Lecture schedules and readings (subject to change)

Wk.	Day	Date	Lecture topic (lecturer)
1	Mon	30 Jan	Introduction and overview (CH)
	Fri	3 Feb	Exploring the brain (CH)
2	Mon	6 Feb	From brain to neuron (CH)
	Fri	10 Feb	Neuronal signaling: the action potential (Guest lecturer: NH-W)
3	Mon	13 Feb	**No lecture**
	Fri	17 Feb	Neurotransmission I: anxiety (PC)
4	Mon	20 Feb	Neurotransmission II: drug abuse (PC)
	Fri	24 Feb	Sensory-motor integration (PC)
5	Mon	27 Feb	Hormones and emotion (PC)
	Fri	3 Mar	Theories of emotion (PC)
6	Mon	6 Mar	Biological basis of emotions (PC)
	Fri	10 Mar	Respondent conditioning (HC)
7	Mon	13 Mar	Goal-directed behavior (HC)
	Fri	17 Mar	Experience-dependent plasticity (HC)
8	Mon	20 Mar	Temperature and thirst (HC)
	Fri	24 Mar	Hunger and satiety (HC)
9	Mon	27 Mar	The limbic brain (HC)
	Fri	31 Mar	The evolution of emotions (KM)
10	Mon	3 Apr	Social behaviour & communication (KM)
	Fri	7 Apr	Sexual selection & communication (KM)
Easter Break April 8-23, 2017			
11	Mon	24 Apr	Cognitive abilities in animals (KM)
	Fri	28 Apr	Primate social and mating systems (KM)
12	Mon	1 May	**No Lecture**
	Fri	5 May	Human evolutionary psychology (KM)

Seminar schedule, topics & readings

The readings for the seminar sessions will be available for downloading and printing from Study Direct at least one week before the seminar.

Seminar 1. Use of animal subjects in psychology research (Week 3)

The goal of psychology is to learn, through experimentation, what circumstances and factors play a role in determining behaviour. Psychologists believe that such knowledge will not only help in our understanding of 'normal' human behaviour, but also in understanding why, in some cases, human behaviour becomes 'abnormal' and how therapies may be designed to intervene. In the area of biological psychology, the focus is on biological circumstances and factors, and because studying biological mechanisms of behaviour often involves invasive experimental techniques (e.g. destruction or lesioning select parts of the brain, administration of psychoactive drugs), this approach most often requires the use of 'non-human' animals in the lab. Nonetheless, students often fail to appreciate that non-human subjects were used in such studies and this seminar provides an opportunity to consider this fact and to discuss with other class members arguments in favour or against the use of non-human animal subjects in psychology studies. The seminar is not intended to sway your opinion on this important topic but merely to have you consider the issues surrounding the use of animals in research.

Please see Study Direct for essential and recommended readings.

Based on these articles and on your own beliefs and ideas, consider and prepare arguments in favour or against the following statements:

i. Whilst the use of animals is warranted for Medical Research aimed at understanding and treating physical disorders such a cancer or HIV, doing so to understand psychological phenomena is not, i.e. is unethical.

ii. Because developing treatments for mental disorders relies on a thorough and basic understanding of how the brain and mind work, using animals in well-designed psychology experiments is warranted, even if no immediate therapeutic benefit is obvious.

Seminar 2. Motivation and addiction (Week 8)

As you know, drug addiction is a tremendous burden on our society, including in terms of costs to healthcare, law-enforcement, job productivity. But, what causes some 'recreational' drug users to become addicted? What is it about drugs such as cocaine, heroin, but also nicotine and alcohol, that causes them to take control over someone's life at the expense of life's other pleasures. The article(s) by Berridge & Robinson outline(s) one of the most comprehensive and thought provoking theories of how drug use can lead to addiction. In the articles, they discuss how drugs produce persistent changes in the brain and, as a consequence in the psychological processes of a person, that can lead to addiction.

To prepare for this seminar you must,

1. Read the article(s) by Robinson and Berridge in the journals *Current Direction in Psychological Sciences* and *Addiction* (see Study Direct).
2. Prepare answers to the following 4 questions:

i. According to Berridge & Robinson, what are the 4 principle tenets of the "incentive-sensitization" theory of addiction and how do these contribute to addiction?

ii. What brain mechanisms do the authors discuss as being involved in the addiction process?

iii. What do the authors mean when they discuss the difference between 'wanting' and 'liking' and why is this distinction important?

iv. What do the authors suggest about potential treatments for addiction?

Seminar 3. Evolutionary psychology (Week 11)

The third seminar aims to introduce you to how evolutionary psychologists, who apply a Darwinian framework to examining human behaviour, investigate the adaptedness of human psychological mechanisms. The studies you will be examining deal with how key acoustic characteristics of male voices (fundamental frequency and formant patterns) may be perceived by potential competitors and mates.

To prepare for this seminar you must read the 2 (short) empirical papers in detail (see links on Study Direct) and consider parallels between humans and animals in honest signalling through vocal characteristics. As well as directly comparing the studies and considering the relevance of their findings, you should also try to critically evaluate them – what are their strengths and weaknesses? If you have time you could also think about other signalling characteristics that may provide receivers with information on male characteristics (see e.g., Gangestad, S.W. & Thornhill, R. (1998) Menstrual cycle variation in women's preferences for the scent of symmetrical men. *Proceedings of the Royal Society London B, 265*; pp. 927-933, or, Buss, D.M. (2014) *Evolutionary Psychology: the new science of the mind (*5th edition, Pearson).

Practical session (Week 7)

It is difficult to get a good grasp of the principles underlying theories of learning and motivation without getting some first-hand experience of what is involved in running a learning experiment. Traditional theories of learning (both classical and operant conditioning) are based on observations with laboratory animals (typically rats and pigeons). However, to conduct a study using live animals as a 'learning exercise' raises both ethical and practical concerns. Our solution therefore is to use a computer resource that simulates a real-life animal behavioural experiment, 'Sniffy the Rat', to experimentally explore operant training paradigms used in typical studies on learning in the lab. The practical class will involve you becoming familiar with the 'Sniffy the Rat' software, and then setting about testing a specific research hypothesis using the experimental paradigms available within the software. The assessment of this component consists of a laboratory report based on class data generated by the Sniffy study collected during the class practical.

Full details of what the report will entail will be provided during the practical and all necessary information and document will be made available on the Study Direct module website.

Essay Topics

For your (reaction) essay, you must choose one of the topics from the list below. I have identified some 'starter readings' from the seminars and/or the textbook to help you on your way, but you are required to research the question yourself and find additional readings.

(1) Is it ever ethical to conduct animal studies to improve our understanding of human brain function, disorders, or therapies? Are there particular conditions that would determine whether your answer is yes or no? (Seminar 1 readings and K&W pp. 193-195)

(2) Should addiction to drugs (or gambling, food) be viewed as a 'disease' and therefore be treated therapeutically, or is it more accurate to view it as a 'moral failure' or the result of poor decision making and therefore be punished? Would it be ethical to force people into addiction treatment programs against heir wishes, even if those therapies include pharmacotherapies? (Seminar 2 readings, K&W Ch. 8)

(3) Can evolutionary principles that explain social behaviour in animals (e.g., kin selection, reciprocal altruism, sexual selection) also be applied to human behaviour? (Seminar 3 readings, K&W Ch. 1, Ch. 12 pp. 397-410; Alcock, J. 2013. Animal Behaviour: an evolutionary approach. (10th edition) Sinauer Associates. [Chapter 14 on The Evolution of Human Behavior]. Clutton-Brock, T. 2016. Mammal Societies. Wiley Blackwell [Chapter 20 on Human Behaviour)

(4) Is it ethical to treat psychological problems or conditions using drugs (pharmacotherapy)? Would it be ethical to impose drug therapy for severe depression or schizophrenia if the patient was unwilling? When drugs fail, is it ethical to use other biological treatments for psychological disorders, such as electroconvulsive shock therapy or psychosurgery? (K&W, Ch. 8, Ch. 16).