DEPARTMENT OF PSYCHOLOGY

SP605 Cognitive Psychology 2008-09

Module Convenor

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Module Tutors

Dr. David Wilkinson

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Time and Location

Spring Term: Monday 11.00am -1.00pm, Keynes Lecture Theatre 1.

Summary of Intended Learning Outcomes

- Knowledge and understanding of cognitive psychology and allied disciplines
- Reading and writing skills
- Critical reflection and written analysis and interpretation
- Subject-specific skills, including evaluating and selecting appropriate frameworks and methodologies for exploring issues in psychology, and employing the inferential method in science
- Communication skills, such as use of information technology
- Other skills, such as working with others and problem solving

Introduction

The module gives students grounding in methods, techniques and issues of cognitive psychology and allied disciplines. Focusing on vision, memory, higher-levels of cognition concerned with language and thought, and methodology, the module examines how cognitive processes are instantiated in mind and brain. It also provides an historical overview of the schools of thought that led to the inception of cognitive psychology as a distinct, academic discipline.

Assessment

Your attention is drawn to the following information to be found on the departmental website:

- Regulations relating to coursework deadlines
  www.kent.ac.uk/psychology/studying/studyskills/assessment.htm#deadlines
Exam Format

TBC, but will involve both essay and multiple choice. The exam will last 2 hours and contribute towards 80% of your final mark. In the case of short-term exchange students unable to sit the exam, these pieces of assessment may be replaced by a single piece of coursework of increased length.

Module Evaluation

You will be asked to provide feedback on this module by completing a module evaluation questionnaire. The questionnaires will be considered at a special meeting of the departmental Learning and Teaching Committee and the minutes of the meeting will be published on the departmental website.

Texts

Main

Recommended

Teaching Programme

You should note that attendance at lectures, seminars and supervisions, and the submission of written work, are obligatory. For further information see the Faculty of Social Sciences Stage 2 and 3 Handbook.

Lecture Outlines

Week 13
Lecture 1 (Dr. David Wilkinson): The Approach of Cognitive Psychology
This lecture will examine the basic principles and methods that underlie research in cognitive psychology. We will also consider some of the over-arching themes that link together its different lines of research, examining both how cognitive psychology has evolved as a discipline, and how it fits within the broader field of cognitive neuroscience.

Essential Reading
Gazzaniga, Ivry & Mangun (2002). Chapters 1 and 4
Week 14
Lecture 2 (Dr. David Wilkinson): Vision I: Low-Level Vision
The first part of the lecture will compare historical and contemporary approaches to vision research. We will then begin our study of how coherent representations of the visual world are formed, starting with the basic perceptual processes that operate on visual information when it first arrives from the eyes.

Essential Reading
Gazzaniga, Ivry & Mangun (2002). Chapter 5
Eysenck & Keane (2005). Chapter 2

Week 15
Lecture 3 (Dr. David Wilkinson): Vision II: Object Recognition
In this lecture we will consider the many challenges that confront object recognition; how do we recognise objects that are partially occluded, viewed from an unusual angle, or that change in shape? We will also examine if faces are processed separately from other kinds of object. That is, whether they are treated as somehow special.

Essential Reading
Gazzaniga, Ivry & Mangun (2002). Chapter 6
Eysenck & Keane (2005). Chapter 3
Ellis & Young (1988). Chapters 2 and 4

Week 16
Lecture 4 (Dr. David Wilkinson): Vision III: Attention
Despite the assertion that ‘everyone knows what attention is’ (James, 1890), very little is known about how attention actually works. Here we will consider the various ways in which attention can be defined, its possible roles, and the fate of stimuli that are ignored and thus denied conscious inspection.

Essential Reading
Gazzaniga, Ivry & Mangun (2002). Chapter 7
Eysenck & Keane (2005). Chapter 5
Ellis & Young (1988). Chapter 3

Week 17
Reading Week

Week 18
Lecture 5 (Dr. David Wilkinson): Memory
Visual perception concerns the means by which we come to understand the messages that are received from the retina. By contrast, visual mental imagery concerns the means by which we produce sensory impressions from memory in the absence of incoming sensory messages. We will examine the means by which visual imagery recreates the sensory world, and will explore the extent to which it shares the same functional and cortical representations as visual perception.
Week 19
Lecture 6 (Dr. Ulrich Weger): Memory
The scope of memory ranges from more local issues such as daily routines to rather
global topics such as an individual’s biographical memory. This lecture will start out
by looking at the more local aspects of memory: The nature and functioning of
working memory; the consolidation of information into memory; retrieval, forgetting
and interference. We will also be looking at individual differences in memory and
how these differences influence and interact with experience.

Essential Reading
Eysenck & Keane (2005). Chapter 6
Gazzaniga, Ivry & Mangun (2002). Chapter 8

Optional Reading

Week 20
Lecture 7 (Dr. Ulrich Weger): Memory
In this lecture we will look at more global aspects of memory. We will examine the
role of concepts and categories and discuss how knowledge is organized; we will
examine how concepts influence perception and how memory is modulated by
context. We will look at memory disorders and their anatomy; finally, we will examine
some practical issues such as false memories and eyewitness memory.

Essential Reading

Optional Reading
Caramazza, A., & Mahon, B.Z. (2003). The organization of conceptual knowledge:
the evidence from category-specific semantic deficits. Trends in Cognitive Sciences,
7, 354-361.

Week 21
Lecture 8 (Dr. Ulrich Weger): Higher-Level Cognition - Language
Language allows us to communicate with others about complex, abstract
phenomena. For other people to be able to understand what we mean, we need to
establish certain conventions. What are these conventions and how do we apply
them? In this lecture we will look at how language is structured and examine data
and theories of language comprehension and production. We will look at how
people read and how eye movements serve as a tool to study language processing.

Essential Reading

Optional Reading

**Week 22**

**Lecture 9 (Dr. Ulrich Weger): Higher-Level Cognition - Language and Consciousness**

We will continue to look at the mechanisms of language processing. We will discuss the phenomenology of some language disorders. Language can be impaired on different levels – for example on a sensory or articulatory level or on a more central, semantic level. What is the anatomy and consequence of such disorders and what does it tell us about normal language processing? In this lecture we will also be looking at differences between conscious and unconscious processing and clarify how memory and language are affected by this.

**Essential Reading**


**Optional Reading**


**Week 23:**

**Lecture 10 (Dr. Ulrich Weger): Higher-Level Cognition: Decision Making and Emotion**

We will look at reasoning and decision making and examine the use of heuristics in this context. We will discuss how emotions influence cognition and examine how brain damage affects decision making.

**Essential Reading**


**Optional- but highly relevant reading Reading:**


**Week 24**

**Revision Lecture/Writing Week**

Drs. Wilkinson and Weger will answer questions from the floor about any part of the course, and will also respond to questions about how best to prepare for the summer exam.

**Extended Essay Titles (Choose 1 from 3)**

You should submit one essay for the course. The essay should be approximately 2500 words and will contribute towards 20% of the final mark for this module.

Information about marking and feedback is at: www.kent.ac.uk/psychology/department/literature.htm.

Essays should be typed, and two copies must be submitted. For those of you who are honours students in the Department of Psychology, submission deadlines for the
three core modules in Spring (SP529, SP605, and SP619) will be **12 noon** on the **Thursday** of Weeks 16 (12/02/2009), 20 (12/03/2009), and 24 (09/04/2009). You will be able to choose which deadline to use for which module. If you are taking two out of the three core Stage 2 modules running in a given term, you may choose two out of the three deadlines for that term. Alternatively, you may submit both essays on the same deadline providing you choose questions that correspond to that deadline. If you are taking one module, you may choose out of the three deadlines but you must still choose a question corresponding to that deadline.

**Deadline #1: 12th February 2009**

Are faces and objects processed in the same way?

**Deadline #2: 12th March 2009**

How does the organization of information in long-term memory influence the processing of new information?

**Deadline #3: 9th April 2009**

Illustrate how the study of language pathologies can be used as a vehicle to better understand language processing in unimpaired individuals.

**SP605 Seminars**

The course is accompanied by two seminars that contribute to the Integrated Seminar Series for second year psychology students. The aim of the two SP605 seminars is to link the specific issues that you have learnt about in the lectures to some of the over-arching challenges that face cognitive psychology in the coming decade. In particular, discussions will centre on how cognitive psychology fits within the emerging discipline of cognitive neuroscience. The development of sophisticated biomedical techniques is changing the way in which we both regard and manipulate the mind. Seminar 1 will examine the extent to which these techniques increase our understanding beyond that obtained with more traditional cognitive measures. Seminar 2 will examine the ethical implications associated with being able to both ‘read’ people’s inner brain states and adjust their behaviour with various forms of neurological intervention.

The two seminars will run in weeks 15 and 19. All the asterisked readings below are in the Library’s Short Term Collection, and items marked with an S are for seminar discussions. Many journal papers and other documents can now be downloaded through the Library’s website at [http://library.ukc.ac.uk/library/netinfo/extservs/Default.htm](http://library.ukc.ac.uk/library/netinfo/extservs/Default.htm). Your seminar leader has a copy of the essential readings too but you should only ask them for a copy as a last resort. In the following reading lists: * Required reading; ** Required reading on line.
Cognitive psychologists are interested in the underlying processes of mind that give rise to behaviour. To explore this, they conduct behavioural experiments and measure performance via reaction time and response accuracy. Traditionally, the role of the neurobiologist has been to identify the physical nuts and bolts of the brain that support these abstract, mental processes. However, the advent of functional brain imaging (e.g. fMRI, PET) has blurred this separation between studies of mind and brain. In particular, some have claimed that functional brain imaging can do more than describe how cognition maps to brain. Rather, that it can inform on the very nature of cognition itself, and show how psychological mechanisms give rise to memory, perception, feelings and language. Such claims are hotly contested by some psychologists. First, they argue that different cognitive processes will not map neatly onto different bits of brain; some processes may share the same part of brain, while a single process may be distributed across multiple parts. If so, then it may not be possible to draw cognitive distinctions on the basis of anatomical distinctions. Second, there are methodological issues that make it difficult to interpret patterns of brain activation; the response of some brain regions may either be too subtle or too fast to detect. Until this argument is resolved, the extent to which measures of brain activity inform on the structure of cognition will remain open to debate. The seminar examines the methods that we have developed to explore the mind, and the assumptions that we must make to believe what they tell us.

Try to read three of the four readings below. The Churchland article talks optimistically (and sometimes a little tangentially) about what studies of the brain can tell us about cognition. The Wilkinson article talks specifically about the pros and cons of using brain-imaging to build cognitive theory. The Bub article expands on some of the methodological problems that blight brain-imaging experiments. The Kosik article provides an insight into the broader difficulty of generating theories about behavioural phenomena that span across multiple levels of explanation. That is, across the cognitive, anatomical, biochemical and genetic domains.

**Seminar questions**

1. What are the different ways in which cognition can be studied?
2. Why have behavioural measures been traditionally used to study cognition?
3. What can functional brain-imaging tell us about cognition?
4. What is mind-brain reductionism? What conceptual problems does it run into?
5. What are the difficulties in generating multi-level accounts of behaviour?

**Reading**


Background reading:


**Week 19 – Cognitive Seminar #2: Do we need a code of neuroethics?**

Our ability to monitor and manipulate brain function is advancing rapidly. Sophisticated imaging techniques allow us to read different brain states, localise mental function, and predict and diagnose disease. Improved forms of drug intervention and surgery have greatly improved our ability to relieve the suffering associated with various neurological conditions, and increased our biochemical understanding of the mind. In recent times, these powerful tools have been applied beyond the clinical domain. The patterns of brain activation detected with fMRI are now being used to help establish if an individual is lying, to establish his/her preference for rival commercial products, and to profile certain personality traits. Future studies aim to predict the likely medical and educational trajectory of an individual. A wide-variety of drugs are now available to ‘cognitively enhance’ memory, attention and other intellectual function in both diseased and healthy individuals, and complex machine-brain interfaces hold the potential for an individual to exert greater control over his/her environment. Perhaps unsurprisingly, there is a growing awareness that these technological developments raise significant ethical concerns about the privacy and safety of the individual, and the abuse of societal norms. Despite widespread debate, there is still little consensus on how neuroscience applications should be regulated. In part this reflects the fact that a person’s sense of ethics is closely bound up with his/her nationality, religion, culture, social background and general scientific understanding. Nevertheless, many believe that a moral code is needed to constrain the growing impact of neuroscience. We will discuss these issues in the present seminar.

There are two brief target articles, both of which should be read. The first provides a general outline of those areas of neuroscience that have aroused particular ethical concern. The second examines neuroethics that are pertinent to children. Both are available from the Templeman electronic library. Good starting points for further reading can be found at: [http://www.neuroethics.upenn.edu/](http://www.neuroethics.upenn.edu/)

**Seminar Questions**

1. What is neuroethics and why is it becoming increasingly important?
2. Functional brain-imaging allows one to probe the unconscious motivations and preferences of an individual. To what extent should an individual be held accountable for their thoughts as opposed to their actions? What kinds of non-clinical / commercial venture could benefit from such technology?
3. What is cognitive enhancement and is it always a good thing?
4. Should every child receive a brain scan to identify future disease and help optimise his/her mental development?
5. What are some of the key points that a neuroethics code should include?

Readings
