



COGS701

Research Frontiers in Cognitive Science

S1 Day 2019

Department of Cognitive Science

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Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff

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Unit convenor and lecturer

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Lecturer

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Lecturer

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Lecturer

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Credit points

4

Prerequisites

Admission to MRes

Corequisites

Co-badged status

Unit description

This unit will engage students in critical research issues in cognitive science. We examine the assumptions and methodological issues of the main techniques used across the different fields of cognitive science (e.g., neuroimaging, behavioural, and neuropsychological techniques). The unit will include seminars by experts in the various techniques and student-led analyses of recently published papers. The aim is to provide students with the tools to critically appraise published studies and the inferences made on the basis of experimental data. Activities are based on seminar attendance, directed reading of research articles, and critical discussion of research in both written and oral form.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

- Identify the key critical issues in common methods used in cognitive science
- Provide critical analysis when reading academic research papers, and critically evaluate scientific methods, results and interpretations
- Demonstrate an advanced understanding of the methods available for research into cognitive science
- Demonstrate an advanced understanding of the common underlying assumptions in studying cognition
- Clearly articulate an argument in written and oral form to a variety of audiences
- Critically analyse information from a variety of sources
- Demonstrate an understanding of scientific integrity and the need for rigorous and transparent methodology and reporting of research

General Assessment Information

Late Penalties

Late submission of an assignment will attract a penalty of 5% of the maximum mark for every day that the assignment is late (including weekend days). For example, if the assignment is worth 40 marks and your assignment is submitted 2 days late, a penalty of $2 \times 5\% \times 40 = 4$ marks will be applied and subtracted from the awarded mark for the assignment. Work submitted more than 7 days after the submission deadline will not be marked and will receive a mark of 0. Please note that it is the student's responsibility to notify the University of a disruption to their studies and requests for extensions for assignments must be made via the University's Ask MQ System (as outlined in the [Special Consideration Policy](#)).

Questions about the assessment tasks?

Please email the unit convenors for clarification or questions about any of the assessments - we are happy to discuss essay directions in advance of submission if necessary.

Assessment Tasks

Name	Weighting	Hurdle	Due
Participation	10%	No	Throughout course

Name	Weighting	Hurdle	Due
<u>Leading journal club</u>	10%	No	Dependent on signed up topic
<u>A critical review of a paper</u>	30%	No	2 weeks after paper discussion
<u>Critical issues essay</u>	50%	No	19/06/2019 @ 4pm

Participation

Due: **Throughout course**

Weighting: **10%**

This assessment involves participating, discussing and contributing ideas throughout the course, and reading a journal article each fortnight in advance of class discussion.

The course alternates between lectures given by experts and student-led journal club discussions. Students are given ample opportunity to ask questions, contribute ideas and thoughts and participate. To get the most out of the lectures, students are expected to use the additional materials and recommended readings given for each methods lecture. For the student-led journal club sessions, it is required that all students carefully read the selected paper and critically think about the issues the paper raises. All students are then expected to contribute to the group discussion about the selected paper.

On successful completion you will be able to:

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Leading journal club

Due: **Dependent on signed up topic**

Weighting: **10%**

This assessment involves selecting an academic research paper and leading a student group discussion.

The purpose of this assessment is to provide students with practical experience in critical thinking and reasoning when reading academic articles. It will also provide students with an opportunity to enhance oral communication skills, increase their understanding of methodological techniques commonly used in cognitive science, and increase their familiarity with academic writing.

Each student will nominate to lead a paper discussion on a particular topic. Topics will be based

on particular methods used in Cognitive Science and will follow specific lectures about the topic. Each student will select a paper (either already published or available on a pre-print repository such as BioRxiv or PsyArXiv) that uses the relevant methodology for the nominated topic and upload it to iLearn. All remaining students will then sign up to read and critically discuss one of the selected papers.

On the day of the student-led discussions, students will split into small groups according to which papers they signed up to critically evaluate. The nominated student will lead the discussion by critically reading and preparing for the discussion on the day. There will be department experts in the topic to help facilitate discussion within the groups. All students will contribute to discussing the critical issues within the paper. Groups will complete a short paper summary form throughout the discussion and give a short summary presentation to the whole class about the critical issues in the paper.

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A critical review of a paper

Due: **2 weeks after paper discussion**

Weighting: **30%**

A critical review of a paper

Due: **2 weeks after paper discussion @ 4pm**

Weighting: **30%**

This assessment mimics the task of a pre-publication review. Before papers are published, other researchers are asked to act as 'reviewers' for the journal, assessing the merit of the paper for publication and giving recommendations for improvement.

As part of the previous assessment (leading a journal club), students will have selected a paper (either already published or available on a pre-print repository such as BioRxiv or PsyArXiv) that uses the relevant methodology for that topic. They will then be required to submit their review two weeks after leading the journal-club discussion. This critical review is usually on the paper or manuscript analysed during the journal club discussion but can be a different paper if preferred, as long as it uses the relevant methodology for that topic.

The review needs to be a critical analysis of the particular paper, pointing out problems that

should be addressed or issues that could be improved. The review needs to include a brief summary of the academic paper, identifying major and minor issues, discussing the implications and making constructive recommendations for changes that could improve the study.

The review will be assessed for evidence of:

[1] understanding the goal, methods, analyses & results of the study,

[2] critically and reflective thinking regarding potential major and minor issues with the study, making relevant recommendations for how to improve the study or for follow-on work,

[3] writing, clarity, and argumentation

Word Limit: Up to 1500 words. Writing clear and concise reviews is an important research skill. There will be 5% leeway in the word limit (i.e., up to 75 words over 1500), but beyond that the student will be penalised 5% of the review mark for every further 100 words over the limit.

Due Date: The critical review of a paper is due two weeks after the student led the journal club discussion. An electronic version of the review must be submitted to iLearn by 4 pm on the due date through Turnitin.

Late submission of this review will attract a penalty of 5% of the maximum mark for every day that the assignment is late (including weekend days). For example, if it is submitted 2 days late, there will be a penalty of 10% for this assignment. Work submitted more than 14 days after the submission deadline will not be marked and will receive a mark of 0. Please note that it is the student's responsibility to notify the University of any disruption to studies and that requests for extensions for assignments must be made via the University's Ask MQ System (as outlined in the [Special Consideration Policy](#)).

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Critical issues essay

Due: **19/06/2019 @ 4pm**

Weighting: **50%**

This assessment requires writing a 3000 word essay about key critical issues in cognitive science covered during the course.

The essay should contain an introductory overview and present a number of the most important issues (perhaps 3-4) that arose during the course across the different techniques. It should demonstrate an understanding and detailed knowledge about the important issues in conducting research in cognitive science. The essay should include explanations about the significance of these issues and provide supporting evidence by referring to evidence-based scientific papers. The essay should also highlight critical issues and flaws within cited papers, and relate the impact these can have on the interpretation.

The essay will be assessed based on evidence of:

[1] critical thinking and understanding of the selected issues

[2] writing, clarity and argument

[3] correct use of referencing and reference list (APA style).

Word Limit: 3,000 words excl reference list. Please write the word count on the cover page. There will be 5% leeway in the word limit (i.e., up to 150 words over 3,000), but beyond that the student will be penalised 5% of the essay mark for every further 100 words over the limit.

Due Date: The critical issues essay is due Wednesday 19th June 2018 at 9am. An electronic version of the essay has to be submitted to iLearn through Turnitin by 9am on the due date.

Late submission of the essay will attract a penalty of 5% of the maximum mark for every day that the assignment is late (including weekend days). For example, if it is submitted 2 days late, there will be a penalty of 10% for this assignment. Work submitted more than 14 days after the submission deadline will not be marked and will receive a mark of 0. Please note that it is the student's responsibility to notify the University of any disruption to studies and that requests for extensions for assignments must be made via the University's Ask MQ System (as outlined in the [Special Consideration Policy](#)).

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Delivery and Resources

ABOUT THIS UNIT

This unit will engage students in critical research issues in cognitive science. We examine the assumptions and methodological issues of the main techniques used across the different fields of cognitive science (e.g., neuroimaging, behavioural, and neuropsychological techniques). The course will include lectures by experts in the various techniques and student-led analysis of recent published papers. The aim is to provide students with the tools to critically appraise published studies and the inferences made on the basis of experimental data. Activities are based on seminar attendance, directed reading of research articles, and critical discussion of research in both written and oral form.

Delivery

There will be 13 weekly seminars that run for 2 hours each.

Seminars will start in Week 1 of Session 1 on **Wednesdays from 1.30-3.30pm** in the Australian Hearing Hub, Level 3, seminar room 3.610 (Marrie)

We expect 100% attendance to the weekly seminars. If there are any issues with attendance, please email Dr Regine Zopf in advance of the class. We require all students to participate in the discussion in the journal club seminars, which requires thorough reading of the assigned papers.

Resources

The required readings for this unit will be nominated by students.

Recommended readings will be given by lecturers for each lecture.

Slides and readings from each lecture will be available on this unit's iLearn page.

Unit Schedule

Date	Topic	Lecturer
27 th Feb (Week 1)	Overview & experiment design/analysis	Prof. Anina Rich
6 th March (Week 2)	Behavioural papers	
13 th March (Week 3)	Functional Magnetic Resonance Imaging (fMRI)	Dr Regine Zopf
20 th March (Week 4)	fMRI papers	

27 th March (Week 5)	Electroencephalography (EEG)	Dr Amanda Robinson
3 rd April (Week 6)	EEG papers	
10 th April (Week 7)	Magnetoencephalography (MEG)	Dr Amanda Robinson
17 th April	<i>Mid-Semester Break</i>	
24 th April	<i>Mid-Semester Break</i>	
1 st May (Week 8)	MEG papers	
8 th May (Week 9)	Patient studies (single case vs. group)	Prof. Lyndsey Nickels
15 th May (Week 10)	Patient papers	
22 nd May (Week 11)	Neural stimulation	A/Prof. Paul Sowman
29 th May (Week 12)	Neural stimulation papers	
5 th June (Week 13)	Summing up	Dr Regine Zopf

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)

- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Undergraduate students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/student-policy-gateway) (<https://students.mq.edu.au/support/study/student-policy-gateway>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcomes

- Identify the key critical issues in common methods used in cognitive science
- Provide critical analysis when reading academic research papers, and critically evaluate scientific methods, results and interpretations
- Demonstrate an advanced understanding of the methods available for research into cognitive science

Assessment tasks

- Participation
- Leading journal club
- A critical review of a paper
- Critical issues essay

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- Identify the key critical issues in common methods used in cognitive science
- Provide critical analysis when reading academic research papers, and critically evaluate

scientific methods, results and interpretations

- Demonstrate an advanced understanding of the common underlying assumptions in studying cognition
- Clearly articulate an argument in written and oral form to a variety of audiences
- Critically analyse information from a variety of sources

Assessment tasks

- Participation
- Leading journal club
- A critical review of a paper
- Critical issues essay

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- Provide critical analysis when reading academic research papers, and critically evaluate scientific methods, results and interpretations
- Demonstrate an advanced understanding of the common underlying assumptions in studying cognition
- Critically analyse information from a variety of sources
- Demonstrate an understanding of scientific integrity and the need for rigorous and transparent methodology and reporting of research

Assessment tasks

- Participation
- Leading journal club
- A critical review of a paper
- Critical issues essay

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcome

- Clearly articulate an argument in written and oral form to a variety of audiences

Assessment tasks

- Participation
- Leading journal club
- A critical review of a paper
- Critical issues essay

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

Learning outcome

- Demonstrate an understanding of scientific integrity and the need for rigorous and transparent methodology and reporting of research

Assessment tasks

- Participation
- Leading journal club
- A critical review of a paper
- Critical issues essay

Statement on academic courtesy

It is the right of each student to learn in an environment that is free of disruption and distraction. Please arrive to all classes on time, and if you are unavoidably detained, please enter as quietly as possible to minimise disruption. Phones, pagers, and other electronic devices that produce noise and other distractions must be turned off prior to entering class. Where your own device (e.g., laptop) is being used for class-related activities, you are asked to close down all other applications to avoid distraction to you and others.

COGS701 involves methods that allow us to study the brain. We therefore may use images and videos of human brains and dissections, as well as discussing patients with brain damage and animal research. It is a discussion-based interactive course, which means all students need to feel comfortable contributing to class conversations. Please treat both staff and your fellow students with the utmost respect.

Statement on social inclusion and diversity

Social inclusion at Macquarie University is about giving everyone who has the potential to benefit from higher education the opportunity to study at university, participate in campus life and flourish in their chosen field. The University has made significant moves to promote an equitable, diverse and exciting campus community for the benefit of staff and students. It is your responsibility to contribute towards the development of an inclusive culture and practice in the areas of learning and teaching, research, and service orientation and delivery. As a member of the Macquarie University community, you must not discriminate against or harass others on the basis of their sex, gender, race, marital status, carers' responsibilities, disability, sexual preference, age, political conviction or religious belief. All staff and students are expected to display appropriate behaviour that is conducive to a healthy learning environment for everyone. The Unit Convenors are active supporters of equity and diversity at Macquarie University and are happy to provide additional support if needed.