

COGS301

Current Problems in Cognitive Science

S2 Day 2017

Department of Cognitive Science

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Disclaimer

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 Convenor David Kaplan david.kaplan@mq.edu.au AHH 3.822 By appointment and Thursdays 3-4

Credit points 3

Prerequisites (39cp at 100 level or above) including COGS202

Corequisites

Co-badged status

Unit description

Despite the explosive growth in recent decades of the cognitive and brain sciences, an abundance of fundamental problems remain unanswered. This unit provides students with the opportunity to think broadly and critically about the pressing issues facing cutting-edge cognitive science, and explore the theoretical and methodological foundations of this research. Students will have the opportunity to pursue a significant, independent research project exploring the primary scientific literature and latest findings on their chosen topic. Guest lectures cover recent developments and controversies in cognitive science, and other online resources will help to situate this focused project within the broader landscape of cognitive science. Throughout this unit, strong emphasis will be placed on effective scientific communication; the consolidation of acquired knowledge and skills; and the deepening of one's understanding of active problems in cognitive science research.

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:

Demonstrate independent research capability to investigate and analyse open problems in the field.

Critically evaluate contemporary cognitive science controversies by applying knowledge

and problem-solving skills to examples from the field.

Successfully identify latent strengths and limitations of current cognitive science research Explain current theories, methods, and findings in basic and applied cognitive science.

General Assessment Information

Attendance Policy

Students are expected to attend all meetings and come prepared to participate actively in discussions. Roll will be taken. If you cannot attend a particular meeting, please email Dr Kaplan (david.kaplan@mq.edu.au) BEFORE the class.

Late Policy

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 2x5%x40 = 4 marks will be applied and subtracted from the awarded mark for the 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 a disruption to their studies and that requests for extensions for assignments must be made via the University's Ask MQ System (as outlined in the Disruption to Studies Policy).

Submission of work via iLearn

You are required to submit all of your written work via iLearn, using the Turnitin submission tool. Please do not email files to the unit convenor. If you need a refresher, please use the step-by-step guide on how to submit a Turnitin assignment.

Assessment Tasks

Name	Weighting	Hurdle	Due
Individual/group presentation	20%	No	Week 5
Commentary Paper 1	15%	No	Week 6
Commentary Paper 2	15%	No	Week 10
Research Paper	50%	No	Week 13

Individual/group presentation

Due: Week 5 Weighting: 20% Students will be given both an overall group presentation grade and an individual grade based on short write-ups detailing their individual contribution. Group presentation component (5%); individual written component (15%).

On successful completion you will be able to:

- Demonstrate independent research capability to investigate and analyse open problems in the field.
- Critically evaluate contemporary cognitive science controversies by applying knowledge and problem-solving skills to examples from the field.
- Successfully identify latent strengths and limitations of current cognitive science research
- Explain current theories, methods, and findings in basic and applied cognitive science.

Commentary Paper 1

Due: Week 6

Weighting: 15%

Highly structured essay designed to teach students to read, summarise, and think critically about research in cognitive and brain sciences. 750 words maximum.

On successful completion you will be able to:

- Critically evaluate contemporary cognitive science controversies by applying knowledge and problem-solving skills to examples from the field.
- Successfully identify latent strengths and limitations of current cognitive science research
- Explain current theories, methods, and findings in basic and applied cognitive science.

Commentary Paper 2

Due: Week 10 Weighting: 15%

Highly structured essay designed to teach students to read, summarise, and think critically about research in cognitive and brain sciences. 750 words maximum.

On successful completion you will be able to:

- Critically evaluate contemporary cognitive science controversies by applying knowledge and problem-solving skills to examples from the field.
- Successfully identify latent strengths and limitations of current cognitive science research
- Explain current theories, methods, and findings in basic and applied cognitive science.

Research Paper

Due: Week 13

Weighting: 50%

Critical evaluation and analysis of a topic related to some aspect of the unit content. Topics may be self-selected but are subject to instructor approval. 2000-3000 words maximum.

On successful completion you will be able to:

- Demonstrate independent research capability to investigate and analyse open problems in the field.
- Critically evaluate contemporary cognitive science controversies by applying knowledge and problem-solving skills to examples from the field.
- Successfully identify latent strengths and limitations of current cognitive science research
- Explain current theories, methods, and findings in basic and applied cognitive science.

Delivery and Resources

Delivery

Seminar discussions are held weekly, starting in Week 1 on Thursdays from 1-3PM in the Australian Hearing Hub, Level 3 (3.610).

Readings

All readings are available through iLearn and the Library.

<u>iLearn</u>

You will need access to the internet to access the unit's iLearn page. You are also required to submit assessment tasks via iLearn, using the Turnitin submission tool. If you are not already familiar with these, please allow time to familiarise yourself with how to access iLearn and how to submit a Turnitin assignment.

Recommended resource on academic honesty

The learning skills team at Macquarie University has designed an <u>Academic Integrity Module</u> for you to enrol in to help you learn about:

- · What "academic integrity" is and why it's important
- · Acceptable and unacceptable academic behaviours at university
- · What 'plagiarism' is and key strategies to avoid it
- Your responsibilities in relation to academic integrity and your rights under the Macquarie University Academic Honesty Policy.

Unit Schedule

Week 1 (3 August). What is Cognitive Science?

Required Readings

Thagard, P. (2014). Cognitive science. In E.N. Zalta (Ed.) *The Stanford encyclopedia of philosophy* (Fall 2014 Edition), Stanford, CA: The Metaphysics Research Lab. <u>https://plat o.stanford.edu/archives/fall2014/entries/cognitive-science/</u>.

Supplementary Readings (and YouTube Videos)

- Von Eckardt, B. (2001). Multidisciplinarity and cognitive science. *Cognitive Science*, 25, 453-470. doi: 10.1207/s15516709cog2503_5
- The Cognitive Science Song. YouTube. Aarhus University. https://www.youtube.com/ watch?v=XH42KFvnXyI
- Cognition in daily life. YouTube. UC Davis Cognitive Science Club. https://www.youtube.com/watch?v=SZqq8bj3C9c
- 4. Cognitive Science: What is it and why is it important? YouTube. UC Davis Cognitive Science Club. https://www.youtube.com/watch?v=LTThtJMTew8

Week 2 (10 August). Where Did Cognitive Science Come From (Part I)?

Required Readings

- 1. Miller, G.A. (2003). The cognitive revolution: A historical perspective. *Trends in Cognitive Science*, 7(3), 141-144. doi: 10.1016/S1364-6613(03)00029-9
- Gentner, D. (2010). Psychology in cognitive science: 1978–2038. *Topics in Cognitive Science*, 2(3), 328–344. doi: 10.1111/j.1756-8765.2010.01103.x

Supplementary Readings

- Chomsky, N. (1967). Preface to the reprint of A Review of Skinner's Verbal Behavior. In L.A. Jakobovits & M.S. Miron (Eds.), *Readings in the psychology of language.* Englewood Cliffs, NJ: Prentice Hall.
- 2. MacCorquodale, K. (1970). On Chomsky's review of Skinner's Verbal Behavior. *Journal of the Experimental Analysis of Behavior, 13*, 83–99.
- Palmer, D.P. (2006). On Chomsky's appraisal of Skinner's Verbal Behavior: A half century of misunderstanding. *The Behavior Analyst, 29* (No. 2 Fall), 253-267.

Week 3 (17 August). Where Did Cognitive Science Come From (Part II)?

Required Readings

- Bechtel, W., Abrahamsen, A., & Graham, G. (2001). Cognitive science, history. *International Encyclopedia of the Social and Behavioral Sciences* (pp. 2154-2158). Oxford: Elsevier Science.
- Nadel, L. & Piattelli-Palmarini, M. (2003). What is cognitive science? [Introduction] In L. Nadel (Ed.) *Encyclopedia of cognitive science*. Macmillan. http://dingo.sbs.arizona.edu/~massimo/publications/PDF/LN&MPPIntro.pdf

Week 4 (24 August). Levels and Explanation

Required Readings

- Kaplan, D. (2015). Explanation and levels in cognitive neuroscience. In J. Clausen & N. Levy (Eds.), *Handbook of neuroethics* (pp. 9-29). Netherlands: Springer.
- Marr, D. (1982). The philosophy and the approach. In *Vision* (Chapter 1, reissued in 2010). Cambridge, MA: MIT Press. *https://mitpress.mit.edu/books/vision-0*.

Week 5 (31 August). Relating Cognitive and Neural Levels: What if Anything Can Functional Neuroimaging Tell Us About Cognition?

Required Readings

- Bechtel, W., & Richardson, R.C. (2010). Neuroimaging as a tool for functionally decomposing cognitive processes. In S.J. Hanson & M. Bunzl (Eds.), *Foundational issues in human brain mapping* (Chapter 18, pp. 241-262). Cambridge, MA: MIT Press.
- Coltheart, M. (2010). What is functional neuroimaging for? In S.J. Hanson & M. Bunzl (Eds.), *Foundational issues in human brain mapping* (Chapter 19, pp. 263-272). Cambridge, MA: MIT Press.

Supplementary Readings

- Coltheart, M. (2013). How can functional neuroimaging inform cognitive theories? *Perspectives on Psychological Science*, 8(1), 98–103. http://dx.doi.org.simsrad.net.ocs.mq.edu.au/10.1177%2F1745691612469208
- Wixted, J.T, & Mickes, L. (2013). On the relationship between fMRI and theories of cognition: The arrow points in both directions. *Perspectives on Psychological Science*, 8(1), 104–107. http://dx.doi.org.simsrad.net.ocs.mq.edu.au/10.1177%2F1745691612469022
- Mather, M., Cacioppo, J.T., & Kanwisher, N. (2013). How fMRI can inform cognitive theories. *Perspectives on Psychological Science*, 8(1), 108–113. http://dx.doi.org.simsrad.net.ocs.mq.edu.au/10.1177%2F1745691612469037

Week 6 (7 September). Models, Hypotheses, and Inferences

Required Readings

- Rajaram, S., & Pereira-Pasarin, L.P. (2010). Collaborative memory: Cognitive research and theory. *Perspectives on Psychological Science*, *5*(6), 649. http://dx.doi.org/10.1177/ 1745691610388763
- Blumen, H., Rajaram, S., & Henkel, L. (2013). The applied value of collaborative memory research in aging: Behavioral and neural considerations. *Journal of Applied Research in Memory and Cognition*, 2(2), 107-117. doi.org/10.1016/j. jarmac.2013.05.004
- Barnier, A.J., Harris, C.B., & Congleton, A.R. (2013). Mind the gap: Generations of questions in the early science of collaborative recall (Invited commentary on "The applied value of collaborative memory research in ageing: Behavioral and neural considerations"). *Journal of Applied Research in Memory and Cognition*, 2(2), 124-127. doi.org/10.1016/j.jarmac.2013.05.002

Supplementary Readings

- 1. Barnier, A.J. (2012). Memory, ecological validity and a barking dog. *Memory Studies*. do i.org/10.1177/1750698012461243
- Dixon, R.A. (2013). Collaborative memory research in aging: Supplemental perspectives on application (Invited commentary on "The applied value of collaborative memory research in ageing: Behavioral and neural considerations"). *Journal of Applied Research in Memory and Cognition*, 2(2), 128-130. doi.org/10.1016/j.jarmac.2013.05.001
- Simons, D. J., Shoda, Y., & Lindsay, D. S. (2017). Constraints on generality (COG): A proposed addition to all empirical papers. *Perspectives on Psychological Science*. Online First.

Week 7 (14 September). Laboratory Analogues: Likenesses Not Replicas

Required Readings

- Bortolotti, L., Cox, R., & Barnier, A.J. (2011). Can we recreate delusions in the laboratory? *Philosophical Psychology*, 25(1), 109–131.
- Woody, E.Z., & Szechtman, H. (2011). Using hypnosis to develop and test models of psychopathology. *Journal of Mind-Body Regulation*, 1(1). Retrieved from http://mbr.syner_giesprairies.ca/cjh/index.php/mbr/article/view/468

Supplementary Readings (General)

 Cox, R.E., & Barnier, A.J. (2010). Hypnotic illusions and clinical delusions: Hypnosis as a research method. *Cognitive Neuropsychiatry*, *15*(1), 202–232. http://dx.doi.org.simsrad.net.ocs.mq.edu.au/10.1080/13546800903319884

Supplementary Readings (Clinical Conditions and Laboratory Analogues)

- 1. Feinberg, T.E., Eaton, L.A., Roane, D.M., & Giacino, J.T. (1999). Multiple Fregoli delusions after traumatic brain injury. *Cortex, 35*(3), 373–387.
- Vallar, G., & Ronchi, R. (2008). Somatoparaphrenia: a body delusion. A review of the neuropsychological literature. *Experimental Brain Research*, *192*(3), 533–551. <u>https://do</u> i.org/10.1007/s00221-008-1562-y
- Elliott, J.M., Cox, R.E., & Barnier, A.J. (2016). Using hypnosis to model Fregoli delusion and the impact of challenges on belief revision. *Consciousness and Cognition*, *46*, 36-46. doi:10.1016/j.concog.2016.09.011
- Woody, E.Z., Lewis, V., Snider, L., Grant, H., Kamath, M., & Szechtman, H. (2005). Induction of compulsive-like washing by blocking the feeling of knowing: An experimental test of the security-motivation hypothesis of Obsessive-Compulsive Disorder. *Behavioral and Brain Functions: BBF*, *1*, 11. http://doi.org/10.1186/1744-9081-1-11

Week 8. (5 October). The Power of Converging Evidence

Required Readings

- Barnier, A.J., Sutton, J., Harris, C.B., & Wilson, R.A. (2008). A conceptual and empirical framework for the social distribution of cognition: The case of memory [Special Issue]. *Cognitive Systems Research 'Perspectives on Social Cognition'*, 9(1), 33-51. doi:10.1016/j.cogsys.2007.07.002
- Harris, C.B., Barnier, A.J., Sutton, J., & Keil, P. (2010). How did you feel when 'The Crocodile Hunter' died? Voicing and silencing in conversation influences memory for an autobiographical event. *Memory*, *18*(2), 185-197. doi:10.1080/09658210903153915

Supplementary Readings

- Harris, C.B., Barnier, A.J., & Sutton, J. (2013). Shared encoding and the costs and benefits of collaborative recall. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 39(1), 183-195. doi:10.1037/a0028906
- Harris, C.B., Keil, P.G., Sutton, J., Barnier, A., & McIlwain, D. (2011). We remember, we forget: Collaborative remembering in older couples. *Discourse Processes*, *48*, 267-303. doi:10.1080/0163853X.2010.541854

Week 9 (12 October). Fundamentals of Research Design

Required Reading

 Simons, D.J., Boot, W.R., Charness, N., Gathercole, S.E., Chabris, C.F., Hambrick, D.Z., & Stine-Morrow, E.A.L. (2016). Do "brain training" programs work? *Psychological* *Science in the Public Interest, 17*(3), 103-186. [see also Dan Simons' blog on research design: http://blog.dansimons.com]

Supplementary Readings

- Woody, E.Z., & McConkey, K.M. (2003). What we don't know about the brain and hypnosis, but need to: A view from the Buckhorn Inn. *International Journal of Clinical and Experimental Hypnosis*, *51*(3), 309-338. DOI:10.1076/iceh.51.3.309.15523
- Cox, R.E., & Bryant, R.A. (2008). Advances in hypnosis research: Methods, designs, and contributions of intrinsic and instrumental hypnosis. In M.R. Nash & A.J. Barnier (Eds.), *The Oxford handbook of hypnosis: Theory, Research and Practice* (pp. 311-336). Oxford, UK: Oxford University Press.
- Barnier, A.J., Harris, C.B., & Congleton, A.R. (2013). Mind the gap: Generations of questions in the early science of collaborative recall (Invited commentary on "The applied value of collaborative memory research in ageing: Behavioral and neural considerations"). *Journal of Applied Research in Memory and Cognition*, 2(2), 124-127. doi.org/10.1016/j.jarmac.2013.05.002

Week 10 (19 October). Current Burning Questions in Cognitive Science

No required readings this week. Explore the work of at least one of the researchers below. Start with their webpage and read one of their recent articles and one of their popular/press pieces:

Dr Nicholas Badcock: https://www.cogsci.mq.edu.au/members/profile.php?memberID=619

Dr Lisi Beyersmann: https://www.cogsci.mq.edu.au/members/profile.php?memberID=177

Dr Nathan Caruana: https://www.cogsci.mq.edu.au/members/profile.php?memberID=679

Dr Wei He: https://www.cogsci.mq.edu.au/members/profile.php?memberID=643

Dr Simmy Poonian: https://www.cogsci.mq.edu.au/members/profile.php?memberID=1440

Dr Charles Stone: http://www.jjay.cuny.edu/faculty/charles-b-stone

Dr Hua-Chen Wang: https://www.cogsci.mq.edu.au/members/profile.php?memberID=266

Week 11 (26 October). Frontiers of Cognitive Science

Required Readings

- 1. Adolphs, R. (2015). The unsolved problems of neuroscience. *Trends in Cognitive Sciences, 19*(4), 173-175. http://dx.doi.org/10.1016/j.tics.2015.01.007.
- Seth, A. (1 March 2012). Consciousness: Eight questions science must answer. *The Guardian*. https://www.theguardian.com/science/2012/mar/01/consciousness-eight-questions-science
- 3. Vergano, D. (20 December 2013). Q&A: The five big questions in brain science. National

Geographic. http://news.nationalgeographic.com/news/2013/12/131219-brain-bioethics-neuroscience-greely-science/

Week 12 (2 November).

No readings this week. Presentations and class wrap up.

Week 13 (9 November)

No class this week; no readings. Essay due end of this week.

Policies and Procedures

Macquarie University policies and procedures are accessible from <u>Policy Central</u>. Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy_2016.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Complaint Management Procedure for Students and Members of the Public <u>http://www.mq.edu.a</u> u/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy (in effect until Dec 4th, 2017): <u>http://www.mq.edu.au/policy/docs/disr</u>uption_studies/policy.html

Special Consideration Policy (in effect from Dec 4th, 2017): <u>https://staff.mq.edu.au/work/strategy-</u>planning-and-governance/university-policies-and-procedures/policies/special-consideration

In addition, a number of other policies can be found in the Learning and Teaching Category of 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/support/student_conduct/

Results

Results shown in *iLearn*, 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 <u>eStudent</u>. For more information visit <u>ask.m</u> <u>q.edu.au</u>.

Student Support

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

Learning Skills

Learning Skills (<u>mq.edu.au/learningskills</u>) 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

IT Help

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

When using the University's IT, you must adhere to the <u>Acceptable Use of IT Resources Policy</u>. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Assessment task

Research Paper

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Assessment tasks

- Commentary Paper 1
- Commentary Paper 2

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Demonstrate independent research capability to investigate and analyse open problems in the field.
- Critically evaluate contemporary cognitive science controversies by applying knowledge and problem-solving skills to examples from the field.
- Successfully identify latent strengths and limitations of current cognitive science research
- Explain current theories, methods, and findings in basic and applied cognitive science.

Assessment tasks

- Individual/group presentation
- Commentary Paper 1
- Commentary Paper 2
- Research Paper

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Demonstrate independent research capability to investigate and analyse open problems in the field.
- Critically evaluate contemporary cognitive science controversies by applying knowledge and problem-solving skills to examples from the field.
- · Successfully identify latent strengths and limitations of current cognitive science research

Assessment tasks

- Individual/group presentation
- Commentary Paper 1
- Commentary Paper 2
- Research Paper

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Demonstrate independent research capability to investigate and analyse open problems in the field.
- Critically evaluate contemporary cognitive science controversies by applying knowledge and problem-solving skills to examples from the field.

Assessment tasks

- Individual/group presentation
- Research Paper

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- Demonstrate independent research capability to investigate and analyse open problems in the field.
- Critically evaluate contemporary cognitive science controversies by applying knowledge and problem-solving skills to examples from the field.
- · Successfully identify latent strengths and limitations of current cognitive science research
- Explain current theories, methods, and findings in basic and applied cognitive science.

Assessment tasks

- Individual/group presentation
- Commentary Paper 1
- Commentary Paper 2
- Research Paper

Changes since First Published

Date	Description
04/08/2017	Changes to schedule of assessment tasks due dates.
31/07/2017	Туро
28/07/2017	Туро