



NEW THINKING

Advances in the Study of Human Cognitive Evolution

PROGRAMME, PODCASTS & ABSTRACTS



An interdisciplinary workshop supported by All Souls College, The British Academy, Guarantors of Brain, and Magdalen College's Calleva Centre

Venue: Grove Auditorium, Magdalen College, University of Oxford

Convenors: Susanne Shultz, Nicola Byrom, Robin Dunbar & Cecilia Heyes



**BRITISH
ACADEMY**

THE UK'S NATIONAL ACADEMY FOR
THE HUMANITIES AND SOCIAL SCIENCES

New Thinking: Advances in the Study of Human Cognitive Evolution

PROGRAMME

Day 1 Thursday 23rd June, 2011

- 9.20 Welcome and introduction – Cecilia Heyes
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc00_intro.mp4 (audiovisual)
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc00_intro.mp3 (audio only)

Chair – Richard Samuels (Philosophy, Ohio State University, USA)

- 9.30–10.30 Peter Godfrey-Smith
Philosophy, Harvard University, USA
Darwinism and Cultural Change
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc01_godfrey-smith.mp4
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc01_godfrey-smith.mp3

- 10.50–11.50 Cecilia Heyes
All Souls College, University of Oxford, UK
Cultural Inheritance of Cultural Learning
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc02_heyes.mp4
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc02_heyes.mp3

- 11.50–12.50 Kevin Laland
Biology, University of St Andrews, UK
The Mystery of Cumulative Culture
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc03_laland.mp4
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc03_laland.mp3

Chair – Samir Okasha (Philosophy, Bristol University, UK)

- 2.00-3.00 Russell Gray
Psychology, University of Auckland, NZ
A New Comparative Psychology
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc04_gray.mp4
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc04_gray.mp3

- 3.30-4.30 Robert Barton
Anthropology, Durham University, UK
Cortico-cerebellar Evolution and the Distributed Neural Basis of Cognition
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc05_barton.mp4
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc05_barton.mp3

- 4.30-5.30 Louise Barrett, Peter Henzi and David Lusseau
Psychology, University of Lethbridge, Canada
Embodiment: Taking Sociality Seriously
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc06_barrett.mp4
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc06_barrett.mp3

Day 2 Friday 24th June, 2011

Chair – Uta Frith (Cognitive Neuroscience, UCL, UK)

- 9.00–10.00 Kim Sterelny
Philosophy, Australian National University
Signals, Honesty and the Evolution of Language
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc09_sterelny.mp4
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc09_sterelny.mp3
- 10.00–11.00 Eva Jablonka, Daniel Dor & Simona Ginsburg
Cohn Institute, Tel Aviv University, Israel
Experiencing Language
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc10_jablonka.mp4
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc10_jablonka.mp3
- 11.30–12.30 Alison Gopnik
Psychology, University of California, Berkeley, USA
*The Role of Childhood in the Evolution of Cognition:
Babies as the R & D division of the human species*
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc11_gopnik.mp4
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc11_gopnik.mp3

Chair – Robert Foley (Anthropology, University of Cambridge)

- 1.30–2.30 Chris Frith
Wellcome Trust Centre for Neuroimaging at UCL, UK
*Metacognition and the Social Mind: How Individuals Interact at the Neural
Level*
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc07_frith.mp4
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc07_frith.mp3
- 2.30–3.30 Andrew Whiten & David Erdal
Psychology, University of St Andrews, UK
*Why the Hominin Cognitive Niche Was and Is a Crucially Socio-cognitive
Niche*
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc08_whiten.mp4
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc08_whiten.mp3
- 4.00–5.00 Robin Dunbar
Anthropology, University of Oxford, UK
The Social Brain on the Internet
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc12_dunbar.mp4
http://media.podcasts.ox.ac.uk/socanth/ehc2011/ehc12_dunbar.mp3

New Thinking: Advances in the Study of Human Cognitive Evolution

ABSTRACTS

Peter Godfrey-Smith

Philosophy, Harvard University, USA

Darwinism and Cultural Change

Within evolutionary biology, different patterns of explanation become relevant at different "grains" of analysis. Adaptive explanation is most useful at an intermediate grain of analysis, which abstracts away from many of the factors that are the concern of population genetics, but is not so coarse-grained that the structure within populations becomes invisible (Godfrey-Smith and Wilkins 2009). The relevance of Darwinian ideas to the explanation of cultural change in human populations is assessed here using a similar framework.

Cecilia Heyes

All Souls College, University of Oxford, UK

Cultural Inheritance of Cultural Learning

It is widely acknowledged that the cumulative cultural inheritance of technological skills and social practices has played a major role in shaping the ways of life of modern humans. The term 'cultural learning' refers to the psychological processes that make cultural inheritance possible. Curiously, even those researchers who have been most influential in demonstrating the importance of cultural inheritance emphasise that cultural learning depends on gene-based psychological adaptations. Like Evolutionary Psychologists, they assume that cultural learning is made possible by genetically-evolved, human-specific and domain-specific cognitive processes. I will suggest that these assumptions are not supported by recent research on social learning and imitation, social decision-making, and social motivation. This research raises the possibility that many processes of cultural learning are themselves culturally inherited. It may not only be the grist but also the mills of cultural inheritance that are acquired through social interaction in the course of ontogeny.

Kevin Laland

Biology, University of St Andrews, UK

The Mystery of Cumulative Culture

Human demographic and ecological success is frequently attributed to our capacity for cumulative culture, which allows human knowledge and technology to build up and improve over time. Yet it remains a mystery why other animals might possess socially learned traditions but lack this capacity for cumulative cultural knowledge gain. Nor is it immediately apparent what cognitive, social or demographic factors are necessary for accumulation to occur. Here I explore the factors that led to the evolution of the human cultural capability, drawing on a combination of experimental and theoretical approaches. I will present insights from the social learning strategies tournament, and comparative

statistical analyses of primate social learning, which together imply that there may have been selection for increasing reliance on social learning, and for increasingly efficient (including higher fidelity) forms of copying, in the primate lineage leading to humans. I will go on to describe mathematical cultural evolution models that suggest that higher fidelity cultural transmission increases the longevity and amount of cultural traits, and that this in turn promotes cumulative cultural learning. I will move on to describe a mathematical model of the evolution of teaching, which is a mechanism for high-fidelity information transmission, which finds that teaching is more likely to evolve in a cumulative, compared to a non-cumulative, cultural learning context, implying that teaching and cumulative culture may have coevolved. Finally, I will present the findings of an experimental study of cumulative cultural learning involving human children, chimpanzees and capuchin monkeys, which implicates specific cognitive factors as central to cumulative learning, including imitation, teaching, language and prosocial behaviour.

Russell Gray

Psychology, University of Auckland, NZ

A New Comparative Psychology

In their classic 1969 paper Hodos and Campbell bemoaned the absence of appropriate evolutionary theory in comparative psychology. In this talk I will argue that despite the advent of Evolutionary Psychology the situation has changed only a little today. In fact, some Evolutionary Psychologists go so far as to argue that comparative analyses are of little importance. I will oppose this view and outline how modern Bayesian phylogenetics can provide a framework for answering questions about the evolution of cognition and culture.

Robert Barton

Anthropology, Durham University, UK

Cortico-cerebellar Evolution and the Distributed Neural Basis of Cognition

Biologists interested in cognitive evolution have focussed on the dramatic expansion of the forebrain, particularly the neocortex, in lineages such as primates. Another structure, however - the cerebellum - contains four to five times more neurons than the neocortex, is massively and reciprocally inter-connected with it via intermediate nuclei, has complex cognitive and learning functions, and yet has been largely ignored in accounts of cognitive evolution. This talk explores the correlated evolution and ontogeny of neocortex, cerebellum and associated structures and the implications of such patterns for understanding the neural basis of cognition. Consistent with the idea of embodied cognition, brain size is associated with specific sensory-motor specializations. The results emphasize the importance of considering how individual brain regions are embedded within a neural architecture, and potentially reconcile adaptationist and associationist perspectives as applied, for example, to mirror neurons.

Louise Barrett, Peter Henzi and David Lusseau

Psychology, University of Lethbridge, Canada

Embodiment: Taking Sociality Seriously

A very wise person of our acquaintance once said, ‘Read old books to get new ideas’. Here, we pursue the ideas presented in old books by Lev Vygotsky and George Herbert Mead as a means to account for the differences in social life between human and non-human primates and, by extension, their cognition. We consider the contrasting perspectives of Vygotsky and Mead on the links between thought and language, and relate these to subsequent developments in the study of animal cognition, and the emergence of the fields of embodied and distributed cognition. We then use this synthesis to argue that, as Wundt originally suggested, the study of social life must be fundamentally social and situated, and cannot be a laboratory endeavour focused solely on processes within individuals. We use developments in social network analysis (specifically a new formalisation of social networks, which can be presented as multi-dimensional mathematical objects, ‘tensors’) to explore the possibilities of a new approach to comparative social cognition. This approach recognizes that sociality and behaviour are constitutive of cognition and not simply its visible manifestation, and emphasizes that there is no such thing as a social brain in isolation, but a complex nexus of brain, body and world.

Kim Sterelny

Philosophy, Australian National University

Signals, Honesty, and the Evolution of Language

The evolution of language is a long-standing puzzle for many reasons. One is that its very virtues as a system of communication seem to open the door to ruinous free-riding and deception. This paper will locate and partially solve that problem within a framework explaining the evolution of honest signals and informational co-operation in human evolution, and will use that framework to develop a partial picture of language evolution.

Eva Jablonka, Daniel Dor, Simona Ginsburg

Cohn Institute for the History & Philosophy of Science, Tel Aviv University, Israel

Experiencing Language

The evolutionary relationship between human linguistic capacity and humans’ emotional make-up has not, as yet, received focused attention. Was the evolution of language in our lineage possible because early hominines were emotionally different from their ancestors, and, if so, in what ways? Has language altered human emotions? We discuss and develop recent proposals that an important precondition for the evolution of human language was the evolution of social emotions in pre-linguistic humans. We suggest that as language evolved, it altered important aspects of human emotionality, leading to a co-evolutionary feedback between human linguistic ability and human emotions.

Alison Gopnik

Psychology, University of California, Berkeley, USA

The Role of Childhood in the Evolution of Cognition: Babies as the R & D division of the Human Species

Drawing on a new conception of causal understanding which unites psychological, philosophical and computational work, I will use recently reported and new data from children, dogs and wolves to argue that human causal understanding evolved through the combination of cognitive elements that are found separately in other animals. These elements include conceptions of physical causal relationships, of correlation, and of intervention.

Chris Frith

Wellcome Trust Centre for Neuroimaging at UCL, UK

Metacognition and the Social Mind: How Individuals Interact at the Neural Level

I will review recent research in neuroimaging and computation neuroscience, and present a new paradigm for studying decision making in pairs. Results from this paradigm demonstrate that discussion between the partners is necessary and sufficient for creating an advantage for the group decision and a more accurate picture of the world than can be achieved by either partner alone. I conclude that metacognition – the ability to introspect upon one's own experience and to communicate this to another - is the key to understanding the evolution of human cognition, including consciousness and group decision making.

Andrew Whiten and David Erdal

Psychology, University of St. Andrews, UK

Why the Hominin Cognitive Niche Was and Is a Crucially Socio-cognitive Niche

Tooby and deVore argued that hominin evolution hinged on the exploitation of a unique 'cognitive niche'. We propose that a diversity of evidence indicates this was fundamentally a socio-cognitive niche. Analysis of hunter-gatherer ethnologies confirms unprecedented levels of egalitarian behaviour, cooperation and culture, in comparison to other primates and inferred ancestral stages. In conjunction with recent archaeological findings on the evolution of hunting, we use these data to reconstruct socio-cognitive changes in the course of hominin evolution, including joint planning and the impact of language. Precursors to these characteristics are inferred on the basis of recent observational and experimental studies of non-human primates' socio-cognitive abilities including cultural transmission, psychological attributions and understanding the requirements of cooperation.

Robin Dunbar

Anthropology, University of Oxford, UK

The Social Brain on the Internet

In primates and humans alike, the number of social relationships an individual can have is constrained in part by its social cognitive competences and in part by the time available to invest in face-to-face interaction. I will show that time, in particular, has a significant effect on the quality and stability of social relationships. If the quality of a relationship is a function of the time invested in it, then we might expect a technology that allows an individual to cut through the time constraints inherent in face-to-face interaction will allow larger social networks to be maintained. Social networking media on the Internet provide one obvious possibility in this respect. I will review evidence suggesting that the Internet does not (and cannot) help us to widen our social horizons, and will show why.