

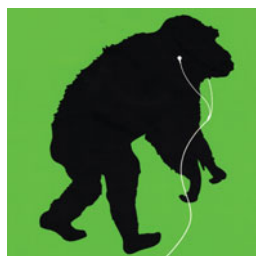
## Review

# Evolution, archaeology and the social brain

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R.I.M. DUNBAR, CLIVE GAMBLE & J.A.J. GOWLETT (ed.). *Lucy to language: the benchmark papers*. xviii+509 pages, 61 b&w illustrations, 16 tables. 2014. Oxford: Oxford University Press; 978-0-19-965259-4 hardback £95.

CLIVE GAMBLE, JOHN GOWLETT & ROBIN DUNBAR. *Thinking big: how the evolution of social life shaped the human mind*. 224 pages, 57 b&w illustrations. 2014. London: Thames & Hudson; 978-0-500-05180-1 hardback £18.95.



In 2002, the British Academy—the UK's top institution for the support and promotion of the humanities and social sciences—celebrated its centenary and marked the occasion by

funding a flagship project. Out of more than 80 applications, the one selected was 'Lucy to language: the archaeology of the social brain'. This seven-year project, led by Robin Dunbar, Clive Gamble and John Gowlett, brought together psychology and archaeology to tackle the major problem of humans in an evolutionary perspective: namely, how and why we evolved such large brains. No small problem, but this was no small project. On its completion, it had involved 55 researchers and had published 29 books and edited volumes, together with more than 400 articles and chapters.

These two books are a form of closure. *Lucy to language: the benchmark papers* is a collection of the major publications (virtually all previously published) that have stemmed from the project. They encompass the main scope of the research: the nature of cognition and its links to sociality; the process of social life, from the individual and his or her relationships to the

larger communities in which humans and hominins live, to the tracking of these aspects of humanity back through time; and how the social brain shapes language, society and culture. *Thinking big: how the evolution of social life shaped the human mind*, written jointly by the three project leaders, is a relatively short and popular summation of the work of the project. Its structure is more chronological, guiding the reader from the basic principles underlying evolutionary psychology and sociality, through to the phases by which one lineage was transformed from a social ape into a hyper-social human.

For such a vast project, there is a remarkably homogeneous theme—the social brain hypothesis. On page 19 of *Thinking big* is the graph that launched a thousand papers (well, 400, anyway). It shows the relationship between the neocortex ratio of anthropoid primates (that is, the size of the neocortex relative to total brain size) and social group size. The larger the group, the larger the neocortex ratio. This lies at the heart of both books and the entire project: namely, that as group size increases, cognitive demands increase, and selection thus favours ever-larger brains. From this, Dunbar, along with other scientists such as Andrew Whiten and Richard Byrne, exploring similar relationships, developed the social brain hypothesis. The brain is a large and expensive organ, and so it can only have evolved under demanding selective conditions, where there were significant benefits. While these may be self-evident to us in our rather self-satisfied human bubble, the fact that most animals survive perfectly well without a large brain is testimony to this evolutionary puzzle. The classic answer would have been that large brains were useful across a range of activities, but particularly for finding food and avoiding predators. The social brain hypothesis takes a different view—larger brains are primarily an adaptation to social complexity. Nicholas Humphrey outlined the theoretical reasoning for this in his

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foundational and classic paper, *The social function of the intellect* (1976). An animal interacting with its 'ecological' environment does so in a relatively static way, with little response on the part of the environment. Social interactions with conspecifics, on the other hand, involve a flexible response with variable outcomes; repeated interactions thus require both memory and decision-making. If Jack meets Jill, and Jill hits him, then Jack needs to remember this at the next interaction, and, be prepared to respond accordingly (be ready to duck). Perhaps, however, next time Jill kisses Jack, and, apart from leading to considerable confusion, it will also select (over many generations) for individuals able to store and process constantly changing information. The reasoning is very persuasive, and puts the brain (the central feature of human evolution) together with compulsive, hyper, human sociality—perhaps our greatest and most unique trait.

The three project leaders have taken a range of approaches to the testing of these ideas. Some have been experimental, evaluating human subjects in terms of sociality and cognitive function, or measuring social network size. In doing so, Dunbar in particular developed the basic brain size/group size relationship (the so-called 'Dunbar's number' of 150) to include the nesting of social relationships and their intensity, and the extension of theory of mind to a more subtle and quantifiable concept than simply being able to see the world from another person's perspective. Gowlett and colleagues explored the nature of stone tool manufacture in the light of the social world of ancient hominins. Gamble took a typically broad-ranging and inventive approach, considering the emotional and personal interactions of hominins under different conditions, exploring the broader sweep of time, space and ecological context.

The range of papers—and the very readable lay summary in *Thinking big*—provides a firm and strongly directed perspective on human evolution, as well as insight into how to develop targeted and ingenious research. Only in the context of such a strong hypothesis can an all-embracing empirical framework be developed. While many questions can be generated from these books, three come to the fore.

The first has to be: how convincing is the social brain hypothesis, both in terms of the psychological work carried out experimentally, and the archaeological applications? The psychological basis is easier to assess, since it is experimental and quantitative, and can be both supported and challenged by

further work. There is little doubt, however, that the role of social factors—and its corollary of cultural mechanisms—has moved into mainstream comparative psychology and animal behaviour, and provided a counter-balance to some of the wilder claims of evolutionary psychology. As someone who has been keen to promote theories of the ecological basis of human evolution, this might seem to me to be regrettable, but far from it. What is clear, as more work is done on human variation in behaviour (rather than generalising across the species from experiments carried out on undergraduates), is that it is different resource distributions and access to them that shows the costs and benefits of social intersections—the classic model of socioecology.

It is harder to be sure about the extent to which the archaeological record supports the social brain hypothesis. In *Thinking big*, the archaeological paradigm of WYSIWYW (what you see is what there was) is developed, and the issues of whether this is misleading are addressed. The authors defend what can be called more of a WTWYSCSBISH (what there was you sadly cannot see but is social, honestly) paradigm, rightly emphasising that there is so much missing from the record that we should not be lured into thinking important only what is preserved. This can be quite convenient, but is probably true. Where the papers in *Lucy to language* are convincing is when they focus on a key material attribute, and provide a substantive link to some social behaviour, such as Gowlett's discussion of hand-axe design.

The second question is the connection between archaeology and evolution. It was, perhaps, a brave decision on the part of the British Academy to select as its centennial project one with an evolutionary subject, given that evolution has not figured greatly in the thinking of many people in the humanities and social sciences. This is true of archaeology, certainly since the Second World War. The success of the Lucy to Language Project, however, is as much due to the fact that it is riding on a broader wave, where Darwinian and evolutionary thinking are having an impact on archaeology, and becoming mainstream. We can see, for example, the interlinking of archaeological and biological approaches in debates over modern humans, the use of evolutionary techniques of analysis, such as cladistics, and Darwinian approaches to even very recent archaeological situations.

The third question is about funding and capacity-building in archaeology. The British Academy award

was worth an initial £1m. Once funded, the project was in the position to attract students and post-docs on other grants, to create critical mass and to maintain an ongoing and impressive academic workforce. This led to further awards, piggy-backing on the achievements of the Lucy to Language Project. The return has been substantial, both in terms of quantity and quality. Nor should it be forgotten that it has also created enormous opportunities for early career researchers, many of whom are now in established posts, and it has probably founded a network of collaborations that will persist for many years. One can imagine the British Academy in a couple of decades, populated by project alumni, musing on whatever happened to Dunbar, Gamble and Gowlett. The success of the Lucy to Language Project is a

challenge to funding policy in the humanities and social sciences, which has preferred an individual and small-scale approach. There may be enormous dangers in investing in large projects—and it may be that it is the underlying scientific framework that made the project workable—but archaeology might consider the benefits of large-scale, hypothesis-driven, interdisciplinary collaborations on the basis of such a major success story.

## Reference

- HUMPHREY, N. 1976. The social function of intellect, in P.P.G. Bateson & R.A. Hinde (ed.) *Growing points in ethology*: 303–17. Cambridge: Cambridge University Press.