**Joint Declaration of Lucy Bates and Richard M. Byrne**

We, Lucy Bates and Richard M. Byrne, declare as follows:

## I. Introduction and Qualifications

### A. Lucy Bates

1. My name is Lucy Bates. I graduated with a Bachelor of Arts (with Honors) in Experimental Psychology from Oriel College at the University of Oxford in 2000. I earned a Master's of Science in Human Biology from the Institute of Biological Anthropology, University of Oxford in 2001 and earned a Ph.D. in Evolutionary Biology from the University of St. Andrews in 2005. From January 2016 to December 2017, I was a Daphne Jackson Trust Postdoctoral Research Fellow at the School of Psychology, University of Sussex, studying culture in elephants. As of January 2018 I have held the title of Visiting Research Fellow at Sussex, and since September 2019 have been additionally employed as an Associate Lecturer within the School of Psychology and Counselling of the Open University. I currently reside in Paris, France.

2. I submit this declaration in support of the Nonhuman Rights Project, Inc.'s petition for a writ of habeas corpus regarding the captive elephants at the Pittsburgh Zoo & Aquarium. I am a nonparty to this proceeding.

3. I study the evolution of cognition and social behavior, and my research focuses on the evolution of cognitive skills which allow social mammals to thrive in close-knit groups. My research has focused on the social and cognitive skills of African elephants since 2005, when I became a Leverhulme Trust Post-Doctoral Research Fellow at the University of St. Andrews. I was an Honorary Research Associate at the University of St. Andrews from 2008 – 2016, and since January 2016 I have continued my research as a Research Fellow at the School of Psychology, University of Sussex.

4. I have been studying elephant cognition and social behaviour for fifteen years, since 2005. During this time, I have worked with the world's pre-eminent elephant biologists, many of whom are also submitting declarations in this matter, and spent months observing wild African elephants in both Kenya and South Africa, working in collaboration with the Amboseli Trust for Elephants, Elephant Voices, and Save the Elephants. In order to be more efficient, my colleagues and I agreed that I would draft the main declaration, which I would circulate to my colleagues for them to add or delete anything they believed was appropriate.

5. I have authored 24 scientific articles and book chapters on social cognition in African elephants and primates. These articles have been published in many of the world's premier scientific journals and books, including: APA Handbook of Personality and Social Psychology, Animal Behaviour, Biology Letters, Current Biology, Neuron, and PLoS One. I have also co-authored a field guide to elephant behaviour, and researched and fully drafted ('ghost-wrote') a popular science book about African elephants for a British media personality.

6. In addition to my research work, I also currently serve as a Director and Management Committee Member for the Elephant Specialist Advisory Group (ESAG), South Africa, a non-profit organisation that offers advice on elephant behaviour and management policy for government departments and managers of reserves within South Africa. I have previously acted as a consultant in elephant welfare and conservation, including freelance work for Save the Elephants, Kenya; Ezevelo KwaZulu Natal Wildlife, South Africa; and Society for the Prevention of Cruelty to Animals, Zimbabwe.

7. I have previously served as a consulting expert in legal matters, including: (1) in 2010/11, where I commented on licensing documents and attended a workshop for Ezemvelo KZN (Kwa Zulu Natal) Wildlife authority (South Africa), which resulted in tighter controls being implemented in the license agreement, considerably improving the elephants' welfare; and (2) in 2009, at the request of the Zimbabwe SPCA, I conducted a site visit and inspection

of a private farm where 10 juvenile elephants were being held. The elephants had been illegally captured from the wild and were undergoing training for the elephant-back safari industry. The ZNSPCA presented our reports to the then Minister for Environment and Tourism, who intervened and said that the elephants were to be rehabilitated and released back in to the wild. They were released six months later, and have adapted well.

8. My Curriculum Vitae fully sets forth my educational background and experience and is annexed hereto as "Exhibit A".

**Basis for opinions**

9. The opinions I state in this Declaration are based on my professional knowledge, education, training, and over 10 years of experience observing and studying elephants, as well as my knowledge of peer-reviewed literature about elephant behaviour and intelligence published in the world's most respected journals, periodicals and books that are generally accepted as authoritative in the field, and many of which were written by myself or colleagues whom I have known for several years and with whose research and field work I am personally familiar. A full reference list of peer-reviewed literature cited herein is annexed hereto as "Exhibit B".

**B. Richard Byrne**

10. My name is Richard William Byrne. I earned my Master of Arts with 1st Class Honours in Natural Sciences from St. John's College, Cambridge between 1969-1972. I received my Ph.D. from the University of Cambridge in 1975 for my thesis entitled "Memory in complex tasks." I am a Fellow of the Royal Society of Edinburgh. I reside and work in St. Andrews, Scotland.

11. I submit this declaration in support of the Nonhuman Rights Project, Inc.'s petition for a writ of habeas corpus regarding the captive elephants at the Pittsburgh Zoo & Aquarium. I am a nonparty to this proceeding.

12. I have studied the evolution of cognition and social behavior throughout my career. As a Professor of Evolutionary Psychology at the University of St Andrews, Scotland, I have studied the evolution of cognition with a particular focus on the origins of uniquely human characteristics, utilizing evidence from a number of mammalian species including great apes, elephants, and domestic pigs, among other animals. I have studied the evolutionary basis of gestural communication, the use of tools, spatial mapping, cognition, and social behaviour.

13. Over the course of my career, I have received several awards and honors related to my research, including; (1) the Wright Prize & Hughes Prize, St Johns College, Cambridge, in 1972; (2) an MRC Studentship, tenure at MRC Applied Psychology Unit, Cambridge, from 1972-1975; (3) a Development Fellowship from the Association of Commonwealth Universities in 1993; (4) *British Psychology Society* Book Award for my Oxford University Press monograph "The Thinking Ape" in 1997; (5) awarded *Convenorship* of Focus Group 2003, "Precursors to Culture," from the Institute of Advanced Study, Collegium Budapest, Hungary in 2001; (6) elected Fellow of the *Royal Society of Edinburgh* (FRSE) in 2002; and (7) elected Fellow of the *Higher Education Academy* in 2007; (8) awarded *British Psychology Society* Lifetime Achievement Award in 2017.

14. In 1987, I founded (along with Bill McGrew at Stirling University, Liz Rogers at Edinburgh University, and Andy Whiten at St. Andrews University) the *Scottish Primate Research Group*, in order to coordinate the research interests of the 3 centers, promote new joint grant applications, encourage outside visitors to Scotland and postgraduate admissions, and coordinate joint seminars and lectures. The *Scottish Primate Research Group* now boasts national and international acclaim and attendance at hosted research presentations and seminars, and it is now larger and more productive than ever with 21 faculty members and over 50 affiliated researchers, including at Aberdeen and Abertay Universities. The focus of SPRG research is the natural behaviour, mentality, and ecology of primates. Field studies are carried

out by core SPRG members at several sites in Africa, Asia, and South America; captive primate studies rely on well-housed breeding groups at Edinburgh Zoo, particularly the SPRG Living Links Research Centre, as well as primate centers in France, Japan, and the USA. (Full Group member and affiliated researcher information can be found at the SPRG website: http://psy.st-andrews.ac.uk/research/sprg/).

15. I have conducted field work as part of my scientific research in multiple sites over my career, including: (1) at Mont Assirik, Senegal from January to April 1979, studying the Guinea baboon (*Papio papio*); (2) at Giant's Castle Game Reserve, South Africa from August to December 1983, studying the Chacma baboon (*Papio ursinus*); (3) at the Mahale Mountains, Tanzania from July to December 1984, studying the Chimpanzee (*Pan troglodytes*); (4) at the Virunga Volcanoes, Rwanda from July to December 1989, studying the Mountain gorilla (*Gorilla b. beringei*); and (5) at Mbeli Bai, Republic of the Congo from August to October 2010, studying the Western gorilla (*Gorilla g. gorilla*).

16. Throughout my career, I have been involved with Editorial work in a variety of capacities. Since 2000, this editorial work has included: (1) Serving on the Editorial Board of *Current Biology*, ongoing since 2006; (2) Serving on the Editorial Board of *Biology Letters*, from 2007-2013; (3) serving on the Editorial Board of *Animal Cognition*, from 1997-2011; (4) Serving on the Editorial Board of the *Journal of the Royal Anthropological Institute*, from 1995-2010; (5) Refereeing of book proposals for a number of publishers, including Basil Blackwell, Cambridge University Press, Curzon Press, Lawrence Erlbaum Associates, Oxford University Press, and John Wiley; (6) Refereeing of manuscripts for many premier scientific journals, including *Science, Nature, PNAS, Proc.Roy.Soc.B., Phil.Trans.B, TICS, TINS, Psychological Science, Psychological Bulletin,* and *Current Biology*; (7) Refereeing of promotion applications for a number of Universities in both the USA and United Kingdom, including Arizona State University, University of California San Diego, University of

Colorado, University of Florida (Gainesville, FL), Max Planck Institute for Evolutionary Anthropology (Leipzing), Miami University of Ohio, University of Natal (Republic of South Africa), University of Portsmouth (UK), University of Stirling (UK), and York University (Toronto); (8) Refereeing of research grants for many research foundations including the Biomedical and Biological Sciences Research Council (BBSRC), the Economic and Social Research Council (ESRC), Israel Academy of Sciences and Humanities (Basic Research Foundation), LSB Leakey Foundation (Oakley, California), Leverhulme Trust, Medical Research Council (MRC, United Kingdom), National Science Foundation (NSF, USA), National Environment Research Council (NERC, United Kingdom), and the National Science and Engineering Research Council (NSERC, Canada); and (9) Refereeing of research programmes for the Leverhulme Trust, Max-Planck-Society (Germany), and Earthwatch Europe.

17. I am affiliated with a number of professional organizations and have engaged in a variety of professional activities throughout my career. Since the year 2000, this has included: (1) Focus Group Convenor, "Precursors to Culture," at the Collegium Budapest Institute for Advanced Studies, Hungary, from Oct-Dec 2003; (2) Member of the Subgroup on *Use of non-human primates in research and testing* from 2000-2002 for the Boyd Group; (3) Vice-President for the *International Primatological Society* from 1996-2001; (4) organized symposium of 18th Congress of the *International Primatological Society*, Adelaide, 2001; (5) discussant at *Perspectives on Imitation*, France, 2002; (6) discussant at *Nijmegen Lectures*, Max Planck Institute for Psycholinguistics/University of Nijmegen, Holland, 2002; (7) organized symposium of St Andrews International Conference on *Animal Social Learning*, June 2005; (8) discussant at symposium *The cognitive triangle: Primates, Cetaceans, and Corvids*, Kyoto, 2006; (9) organized symposium of the 23rd Congress of the *International Primatological Society*, Kyoto, 2010; and (10) served as part of the Steering Committee for

Assessment for the *Quality Assurance Agency /Scottish Higher Education Funding Council* from 2003-2005.

18. I have written two books concerning my work with cognition: (1) *The Thinking Ape: evolutionary origins of intelligence* (1995, Oxford University Press, Oxford, 266 pages; 1997 *British Psychological Society* Book Award winner; Reprinted annually; Japanese edition published by Otsuki Shoten, Tokyo, 1998; Chinese edition, in translation, published by Hunan Education Publishing House, 2006); (2*) Evolving Insight* (2016, Oxford University Press, Oxford, 304 pages).

19. I have co-edited two books concerning my work with cognition: (1) *Machiavellian Intelligence: Social Expertise and the Evolution of Intellect in Monkeys, Apes and Humans* (Co-edited with A. Whiten, 1988, Oxford University Press, Oxford, 413 pages; Japanese edition published by Nakanishiya Shuppan Press, Kyoto, 2004); (2) *Machiavellian Intelligence II: Extensions and Evaluations* (Co-edited with A. Whiten, Cambridge University Press, Cambridge, 1997, 403 pages; Japanese edition published by Nakanishiya Shuppan Press, Kyoto, 2004).

20. I have published 165 peer-reviewed scientific articles over my career. These articles have been published in many of the world's premier scientific journals, including: *Science, Biology Letters, Animal Cognition, Animal Behaviour, Biosemiotics, Behavioural Ecology and Sociobiology, Current Biology, International Journal of Primatology, Annals of the New York Academy of Sciences, Journal of Comparative Psychology, American Journal of Primatology, Trends in Evolution & Ecology, PLoS Biology, PLoS One, Trends in Cognitive Sciences, Philosophical Transactions of the Royal Society of London – Series B Biological Sciences, The Behavioral and brain sciences, Methods, American Journal of Physical Anthropology, Canadian Journal of Psychology, and The British Journal of Mathematical and Statistical Psychology*. Over the last four years, specific topics of these publications have

included: African elephants interpret a trunk gesture as a clue to direction of interest, Interpretation of human pointing by African elephants – generalization and rationality, African elephants recognize visual attention from face and body orientation, Flexibility and survival of Apes in the Anthropocene, Wild baboons (*Papio ursinus*) remember single foraging episodes, The what as well as the why of animal fun, Change point analysis of travel routes reveals novel insights into foraging strategies and cognitive maps of wild baboons, Age-dependent social learning in a lizard, Isolation rearing does not constrain social plasticity in a family-living lizard, The animal origins of disgust: reports of basic disgust in nonhuman great apes, The gestural repertoire of the wild bonobo (*Pan paniscus*): a mutually understood communication system, The meanings of chimpanzee gestures, Bonobo and chimpanzee gestures overlap extensively in meaning, Using cross correlations to investigate how chimpanzees use conspecific gaze cues to extract and exploit information in a foraging competition, Complexity in animal behaviour: towards common ground, African elephants can use human pointing cues to find hidden food, Deictic gesturing in wild chimpanzees – some possible cases, Laterality in the gestural communication of wild chimpanzees, Age-related differences in the use of the "moo" call in black howler monkeys, Evolutionary origins of human handedness – evaluating contrasting hypotheses, Titi monkey call sequences vary with predator location and type, Animal curiosity, Evidence for semantic communication in Titi monkey alarm calls, The alarm call system of wild black-fronted Titi monkeys, From parsing actions to understanding intentions, Serial gesturing by wild chimpanzees – its nature and function for communication, What are we learning from teaching? Local traditions in gorilla manual skill – Evidence for observational learning of behavioural organization, Animal behaviour in a human world: A crowdsourcing study on horses that open door and gate mechanisms, and Cognition in the wild – exploring animal minds with observational evidence.

21. My scientific work has also been published as chapters in 71 books. Over the last four years, these books have included *The Amboseli Elephants: A Long-Term Perspective on a Long-Lived Mammal* (2011, University of Chicago Press), *Integrating Gestures. The interdisciplinary nature of gesture* (2011, John Benjamins Publishing Company, Amsterdam), *Current research in applied ethology* (2011, Kuratorium für Technik und Bauwesen in der Landwirtschaft e.V. (KTBL), Darmstadt, Germany), *Developments in Primate Gesture Research* (2012, John Benjamins Publishing Company, Amsterdam), *Tool Use in Animals: Cognition and Ecology* (2013, Cambridge University Press), *New Perspectives on the symbolic species* (new edition in press, Springer-Verlag, Heidelberg, Germany), *The Emergence of Personhood: A Quantum Leap?* (in press, William B. Eerdmans Publishing Company, Grand Rapids, Michigan), and *Formal Models in Evolutionary Cognitive Archaeology* (in press, New York: Oxford University Press).

22. I have given major invited lectures at international research meetings and symposia throughout the world over the course of my career. Since the year 2000, these have included: (1) a public lecture and discussion on the topic of deception and fake news, with Evan Davies, BBC, at the Royal Institution, London; (2) the 85$^{th}$ James Arthur Lecture at the American Museum of Natural History (Public lecture, 2015), and a public lecture at Emory University, Atlanta; (3) two lectures in 2013: (a) the Tarragona Laterality Conference (invited lecture to closed conference) and (b) a public lecture at the University of Portsmouth; (4) an Invited lecture in the 2012 Workshop "Unpacking intentionality in animal vocal communication: an integrative approach" at the Institute of Evolutionary Biology, University of Zurich; (5) three lectures in 2011: (a) an invited lecture to a symposium entitled "The Emergence of Personhood" for the John Templeton Foundation, (b) a lecture at a closed workshop entitled "The evolution of human handedness" at the Hanse-Wissenschaftskolleg in Delmenhorst, Germany, and (c) a public lecture at the Institute of Evolutionary Biology at the University of Zurich; (6) a

referential communication for a workshop at the 2010 INCORE Thematic Meeting in Berlin; (7) three lectures in 2009: (a) a Plenary lecture at the 11th Congress of the German Society for Primatology in Hanover, Germany, (b) a public "Year of Darwin Lecture" for the School of Biosciences at Birmingham University, and (c) a lecture at the Workshop "Understanding Tool Use" at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany; (8) an invited lecturer at the 2008 Summer School on "Social Cognition" at the Institute of Cognitive Sciences in Montreal; (9) four lectures in 2007: (a) an inter-faculty series "The evolution of social cognition" for the Faculty of Life Sciences at the University of Vienna, (b) a Plenary lecture at the Second Congress of the European Federation of Primatology, at Charles University, Prague, (c) an invited lecture at a Workshop on "Social Cognition" by the MRC/Cold Spring Harbor at St Anne's College, Oxford, and (d) a Plenary lecture at the "Missing Links" conference at Carlsberg Academy, Copenhagen; (10) two lectures in 2006: (a) a lecture at the symposium "From Brain to Culture" hosted by The Royal Society, London, and (b) a Plenary lecture at the 66th Annual Meeting of the Japan Society for Animal Psychology in Kyoto; (11) two lectures in 2005: (a) Plenary lectures at the Portuguese Primatological Association's 2nd International Conference in Lisbon, and (b) a lecture in the "Evolutionary Cognitive Sciences" series at the University of Tokyo; (12) two lectures in 2004: (a) a Public lecture at the Institute of Cognitive & Decision Sciences at the University of Oregon, and (b) a lecture at the closed conference "Roots of Human Sociality" for the Wenner-Gren Foundation for Anthropological Research in North Carolina; (13) an International Workshop in 2003 for the European Workshop in Cognitive Neuropsychology in Bressanone, Italy; (14) three lectures in 2002: (a) a lecture in the Annual Autumn School in Cognitive Neuroscience with the theme "Rational animals?" for the McDonnell-Pew Centre at the University of Oxford, (b) a lecture at an International Workshop called "Perspectives on Imitation" in Royaumont Abbey, France, and (c) Public lectures for the Fundacio "la Caixa"

Museum of Science in Barcelona and the Social & Cultural Centre in Tarragona, Spain; (15) six lectures in 2001: (a) the Keynote Address to the VIIth European Congress of Psychology, forming part of the BPS Centenary in London, (b) a lecture at the "Human Cognition" symposium at the Institute of Cognitive Neurology at UCL, London, (c) a lecture and Press Conference on "Constraints on Culture" for the British Association for the Advancement of Science in Glasgow, (d) the Keynote Lecture for the Consciousness & Experiential Psychology section of the British Psychological Society, (e) a lecture entitled "Knapping Stone: a uniquely hominid behaviour?" for an International Workshop in Abbaye des Premontres, France, and (f) a lecture at an International Workshop "Malingering & Illness Deception" in Blenheim, Oxford; and (16) seven lectures in 2000: (a) a Plenary lecture to the Millennial Meeting "The social brain" for the British Neuropsychiatry Association, (b) the Invited Main Lecture entitled "Primate Cognition" for the International Congress for Cognitive Science in Inuyama, Japan, (c) a lecture at the Symposium "Animal Architecture" for the Gaia Research Project in Edinburgh, (d) a lecture at the International Conference "Human Nature" for the Royal Society of Edinburgh in Edinburgh, a lecture at the Workshop "Cognitive Science" at Sorbonne University in Paris, (e) a lecture at the Symposium "The Social Brain" at the Max Planck Institute in Andechs, Germany, and (f) a lecture at the Symposium "Science and Philosophy of Pain" for the University of Ghent, in Ghent, Belgium.

23. In addition to the major invited lectures listed above, I have given invited, funded talks at: Auckland University (Psychology, Zoology); BAAS SET7 Week (St Andrews); Gesamthochschule, Kassel (Primatenbiologie); Deutsches Primatenzentrum, Gottingen; Duke University, North Carolina (Biological Anthropology); Dundee University (teaching forum); Durham University (Psychology, Anthropology); Eotvos Lorand University, Budapest (Ethology); Hang Sen Centre for Cognitive Studies, Sheffield (twice); Hawaii University, Honolulu (Psychology); Kyoto University; Living Links Center, Emory University; MRC

Cognitive Brain Research Unit, Cambridge (twice); Max Planck Institute, Leipzig; Max Planck Institute, Seewiesen, Bavaria; Miami University, Ohio (Zoology); University of Otago, New Zealand (Psychology); Queens University, Kingston Ontario (Psychology); Universite de Rennes 1 (Zoology); Royal Anthropological Institute, London; Royal (Dick) School of Veterinary Studies, Edinburgh; Yerkes Regional Primate Research Center, Atlanta GA; UCSD (Psychology); York University, Toronto (Psychology); Universities of Aberdeen (Psychology), Abertay (Psychology), Cambridge (Psychology), Archaeology & Anthropology), Reading (Archaeology), St Andrews (Divinity, Modern Languages, Zoology, Psychology), Stirling (Psychology), UCL (Archaeology), Sussex (Neuroscience & Robotics), York (Centre for Human Palaeontology & Human Origins); and the Zoological Society of London.

24. Throughout my scientific career, I have had the privilege of supervising PhD level students. Since the year 2000, these have included: (1) R. Noser, (self-funded), "Navigation by chacma baboons within the home-range" from 1999-2004; (2) R. da Cunha (funded by CAPES, Brazil), "Long distance communication of howler monkeys" from 2000-2004; (3) A. Valero (funded by CONACYT, Mexico), "Social interactions of spider monkeys" from 2000-2004; (4) L. Bates (funded by BBSRC), "Foraging skills of female chimpanzees" from 2001-2005; (5) E. Cartmill (funded by Univ. St Andrews), "Gestural communication in great apes" from 2004-2008; (6) F. Moore (joint supervision), "Effects of resource control on female reproductive strategies from 2005-2006; (7) A. Ruiz (funded by James Cook Foundation and ORS), "Monkeys' understanding of intention and attention" from 2005-2009; (8) C. Hobaiter (funded by own EC grant), "Gestural communication in great apes" from 2007-2010; (9) C. Casar (funded by CAPES, Brazil), "Vocal communication of wild Titi monkeys" from 2007-2011; (10) K. Hall (funded by Janet Anderson Trust and ORSAS), "Theory of mind in chimpanzees" from 2008-2012; (11) L. Orr (funded by NSF Studentship), "Gestural communication in gorillas" from 2010-2014; (12) A. Smet (funded by Univ. St Andrews),

"Cognition in the African Elephant" from 2011-2015; (13) B. Fallon (self-funded), Gestural communication by sexually consorting male chimpanzees" 2012 - 2016; and (14) K. Graham (funded by Univ. St Andrews), "Negotiation of sexual relationships among bonobos" 2013 - 2016.

25. In addition to direct supervision of PhD students, I have also served as an External Postgraduate Examiner for individuals. Since the year 2000, these have included: (1) L. Ambrose, Ph.D. Oxford Brookes University (Anthropology) in 2000; (2) A. Nowell, M.Sc. University of Stirling (Psychology) in 2001; (3) B. A. Whiting, M.Sc. University of Durham (Anthropology) in 2002; (4) K. Rigby, Ph.D. London School of Economics (Psychology) in 2002; (5) P. Citrynell, Ph.D. Exeter University (Psychology) in 2003; (6) J. Dally Ph.D. University of Cambridge (Psychology) in 2004; (7) P. Citrynell Ph.D. Exeter University (Psychology, re-examination) in 2004; (8) J. Dalley Ph.D. University of Cambridge (Psychology); (9) Dr. Thomal Bugnyar, Habilitation, University of Vienna (Faculty of Life Sciences) in 2008; (10) C. Bird University of Cambridge (Psychology) in 2009; (11) P. Bertolani University of Cambridge (Archaeology & Anthropology) in 2012; (12) J. Trosciano University of Birmingham (Psychology) in 2012; (13) J. Wathen University of Sussex in 2015; (14) A. Picard, University of York, 2016; (15) A. Frohnwieser, University of Lincoln, 2017; (16) M. de Guinea, Oxford Brookes University, 2020.

26. I have been interviewed and my scientific research has been featured on a number of radio broadcasts, including: (1) interviews with BBC Radio 4 "Today" in 2000 and 2008; (2) with BBC Radio 4 as an interview with Jonathan Miller, "Self-made things" in 2005; (3) interview on Australian Radio with an article on my own research in "The Science Show" in 2001; (4) interview on Radio Netherlands with an article on my own research in 2001. Additionally, other interviews on my own research have been featured on: ABC Radio Australia, Austrian Broadcasting Corporation, US Public Broadcasting Network, Breakfast

Radio Auckland (NZ), Radio Canada, Western Australia Radio, Discovery Canada, Radio New Zealand "Morning Report," Radio Ireland, Talkback Radio (Ireland), BBC World Service, BBC Radio Scotland, Radio Wales, Radio Cambridgeshire, BBC Radio Jersey, BBC Radio 5 Live, Radio Tay, Kingdom FM, Talk 107, Voice of Russia, and Wave 102.

27. I have appeared and been featured in a number of Television broadcasts, including: (1) Interview with BBC1 6 O' Clock News (Scotland) on my own great ape research in 2008; (2) Interview with BBC1 6 O' Clock News (UK) on my own elephant research in 2013; (3) as a consultant for the BBC2 Program "The Secret Life of Pigs" in 2010; (4) Interview with BBC World/BBC4 Evening News on my own elephant research in 2013; (5) Interview with ITV/STV (ITN News) on my own elephant research in 2013; and (6) Interview with Australian ABC Channel TV as part of a programme on my research in the "Catalyst" series.

28. My Curriculum Vitae fully sets forth my educational background and experience and is annexed hereto as "Exhibit C".

**Basis for opinions**

29. The opinions I state in this Declaration are based on my professional knowledge, education, training, and years of experience observing and studying elephants, as well as my knowledge of peer-reviewed literature about elephant behaviour and intelligence published in the world's most respected journals, periodicals and books that are generally accepted as authoritative in the field, and many of which were written by myself or colleagues whom I have known for several years and with whose research and field work I am personally familiar. A full reference list of peer-reviewed literature cited herein is annexed hereto as "Exhibit B".

**II. Opinions**

**A. Premise**

30. Elephants are autonomous beings. Autonomy in humans and nonhuman animals is defined as self-determined behaviour that is based on freedom of choice. As a psychological concept it implies that the individual is directing their behaviour based on some non-observable,

internal cognitive process, rather than simply responding reflexively. Although we cannot directly observe these internal processes in other humans, we can explore and investigate them by observing, recording and analysing their behaviour. We can explore autonomy in non-human animals in a similar way, by observing similar behaviour and recording evidence of shared cognitive capacities in elephants.

31. We shall indicate which species, African (*Loxodonta Africana*) or Asian (*Elephus maximus*), specific observations relate to. If the general term 'elephants' is used with no specific delineation, it can be assumed the comment relates to both species.

**B. Brain And Development**

32. Elephants are large-brained, with the biggest absolute brain size of any land animal (Cozzi et al. 2001; Shoshani et al. 2006). Even relative to their body sizes, elephant brains are large. Encephalization quotients (EQ) are a standardised measure of brain size relative to body size, and illustrate by how much a species' brain size deviates from that expected for its body size. An EQ of one means the brain is exactly the size expected for that body, and values greater than one indicate a larger brain than expected (Jerison 1973). Elephants have an EQ of between 1.3 and 2.3 (varying between sex and African and Asian species). This means an elephant's brain can be more than twice as large than is expected for an animal of its size. These EQ values are similar to those of the great apes, with whom elephants have not shared a common ancestor for almost 100 million years (Eisenberg 1981, Jerison 1973). Given how metabolically costly brain tissue is, the large brains of elephants must confer significant advantages; otherwise their size would be reduced. The advantage of a large brain is to allow greater cognitive skill and behavioural flexibility (Bates et al. 2008a).

33. Typically, mammals are born with brains weighing up to 90% of the adult weight. This figure drops to about 50% for chimpanzees. Human baby brains weigh only about 27% of the adult brain weight, increasing in size over the prolonged childhood period (Dekaban &

Sadowsky 1978). This long period of brain development over many years (termed 'developmental delay') is a key feature of human brain evolution. It provides a longer period in which the brain may be shaped by experience and learning (Fuster 2002), and plays a role in the emergence of our complex cognitive abilities such as self-awareness, creativity, forward planning, decision making, and social interaction (Bjorkland 1997). Likewise, elephant brains at birth weigh only about 35% of their adult weight (Eltringham 1982), and elephants show a similarly protracted period of growth, development and learning (Lee 1986). This similar developmental delay in the elephant brain is likewise associated with the emergence of analogous cognitive abilities.

34. Despite nearly 100 million years of separate evolution (Hedges 2001), elephants share certain characteristics of our large brains, namely deep and complex folding of the cerebral cortex, large parietal and temporal lobes, and a large cerebellum (Cozzi et al. 2001). The temporal and parietal lobes of the cerebral cortex manage communication, perception, and recognition and comprehension of physical actions (Kolb and Whishaw 2008), while the cerebellum is involved in movement, planning, empathy, and predicting and understanding the actions of others (Barton 2012). The physical similarities between human and elephant brains occur in areas that are relevant to capacities necessary for autonomy and self-awareness.

35. Elephant brains hold three times more neurons than do human brains, with 97% of their found neurons in the cerebellum and 5.6 billion neurons in the cerebral cortex (Herculano-Houzel et al. 2014). (This figure for cortical neurons is lower than previous estimates, which suggested 11 billion cortical neurons for elephants and 11.5 billion for humans (Roth & Dicke 2005)). Elephants' pyramidal neurons (a class of neuron that is found in the cerebral cortex, particularly the pre-frontal cortex - the brain area that controls executive functions) are larger than in humans and most other species (Cozzi et al. 2001; Jacobs et al. 2011). (This term "executive function" refers to controlling operations, for example paying attention, inhibiting

inappropriate responses, deciding how to use memory search, and so on. These abilities develop late in human infancy and are often impaired in dementia).

36. Elephant pyramidal neurons have a large dendritic tree, i.e. a large number of connections with other neurons for receiving and sending signals (Cozzi et al. 2001; Jacobs et al. 2011; Maseko et al. 2012). The degree of complexity of pyramidal neurons is linked to cognitive ability, with more (and more complex) connections between pyramidal neurons being associated with increased cognitive capabilities (Elston 2003).

37. As described below, evidence demonstrates that along with these common brain and life-history characteristics, elephants share many behavioural and intellectual capacities with humans, including: self-awareness, awareness of death, empathy, intentional communication, learning, memory, and categorisation abilities. Many of these capacities have previously been considered – erroneously – to be uniquely human, and each relates to autonomy and self-determination.

**C. Awareness Of Self And Others**

38. An Asian elephant has exhibited Mirror Self Recognition (MSR) using Gallup's classic 'mark test' (Gallup 1970; Plotnik et al. 2006). MSR is the ability to recognise a reflection in the mirror as oneself, and the mark test involves surreptitiously placing a coloured mark on an individual's forehead that it could not see or be aware of without the aid of a mirror. If the individual uses the mirror to investigate the mark, the individual must recognise the reflection as herself. (See video here). Despite numerous attempts and trials in other species, the only other mammals (beyond humans) who have successfully passed the mark test and exhibit MSR are the great apes (chimpanzees, bonobos, gorillas and orangutans) (Parker, Mitchell & Boccia 1994) and one bottlenose dolphin Reiss and Marino 2001). MSR is significant because it is a key identifier of self-awareness. Self-awareness is intimately related to autobiographical memory in humans (Prebble et al. 2013) and is central to autonomy and

being able to direct one's own behaviour to achieve personal goals and desires. ("Autobiographical memory" refers to what one remembers about his or her own life; for example, not that "Paris is the capital of France", but the recollection that you had a lovely time when you went there). By demonstrating that they can recognize themselves in a mirror, elephants must be holding a mental representation of themselves from another perspective, and thus be aware that they are a separate entity from others (Bates and Byrne 2014).

39. Related to possessing a sense of self is an understanding of death. Observing reactions to dead family or group members appears to demonstrate an awareness of death in two known animal genera beyond humans; chimpanzees and elephants (Anderson et al. 2010, Douglas-Hamilton et al. 2006; Sharma et al. 2020). Having a mental representation of the self – a pre-requisite for mirror-self recognition – likely also confers an ability to comprehend death. Wild African elephants have been shown experimentally to be more interested in the bones of dead elephants than the bones of other animals (McComb et al. 2006) (See video here), and they have frequently been observed using their tusks, trunk or feet to attempt to lift sick, dying or dead individuals (see Poole & Granli 2011; Goldenberg & Wittemyer 2020). Although they do not give up trying to lift or elicit movement from the body immediately, elephants appear to realise that once dead, the carcass cannot be helped anymore, and instead they engage in more 'mournful' behaviour, such as standing guard over the body and protecting it from the approaches of predators (Poole & Granli 2011; Goldenberg & Wittemyer 2020) (See photographs here). They also have been observed to cover the bodies of dead elephants with dirt and vegetation (Moss 1992; Poole 1996). In the particular case of mothers who lose a calf, although they may remain with the calf's body for an extended period, they do not behave towards the body as they would a live calf. Indeed, the general demeanour of elephants who are attending to a dead elephant is one of grief and compassion, with slow movements and few vocalisations (Poole, pers. comm.; Goldenberg & Wittemyer 2020). These behaviours are akin

to human responses to the death of a close relative or friend, and illustrate that elephants possess some understanding of life and the permanence of death.

40. The capacity for mentally representing the self as an individual entity has been linked to general empathic abilities (Gallup 1982), where empathy can be defined as identifying with and understanding another's experiences or feelings by relating personally to their situation. Empathy is an important component of human consciousness and autonomy, and is a cornerstone of normal social interaction. It goes beyond merely reading the emotional expressions of others. It requires modeling of the emotional states and desired goals that influence others' behaviour both in the past and future, and using this information to plan one's own actions; empathy is only possible if one can adopt or imagine another's perspective, and attribute emotions to that other individual (Bates et al. 2008b). Empathy is, therefore, a component of and reliant on 'Theory of Mind' - the ability to mentally represent and think about the knowledge, beliefs and emotional states of others, whilst recognising that these can be distinct from your own knowledge, beliefs and emotions (Premack and Woodruff 1978; Frith and Frith 2005).

41. Elephants clearly and frequently display empathy in the form of protection, comfort and consolation, as well as by actively helping those who are in difficulty, such as assisting injured individuals to stand and walk, or helping calves out of rivers or ditches with steep banks (Bates et al. 2008b; Lee 1987). Elephants have even been observed feeding those who are not able to use their own trunks to eat (Poole and Granli 2011).

42. In an analysis of behavioural data collected from wild African elephants over a 40-year continuous field study, we concluded that as well as possessing their own intentions, elephants can diagnose animacy and goal directedness in others, understand the physical competence and emotional state of others, and attribute goals and mental states (intentions) to others (Bates et al. 2008b), as evidenced in the examples below:

*'IB family is crossing river. Infant struggles to climb out of bank after its mother. An adult female [not the mother] is standing next to calf and moves closer as the infant struggles. Female does not push calf out with its trunk, but digs her tusks into the mud behind the calf's front right leg which acts to provide some anchorage for the calf, who then scrambles up and out and rejoins mother.'*

(See video here).

*'At 11.10ish Ella gives a 'lets go' rumble as she moves further down the swamp . . . At 11.19 Ella goes into the swamp. The entire group is in the swamp except Elspeth and her calf [<1 year] and Eudora [Elspeth's mother]. At 11.25 Eudora appears to 'lead' Elspeth and the calf to a good place to enter the swamp — the only place where there is no mud.'*

Examples such as these demonstrate that the acting elephant (the adult female in the first example, and Eudora in the second) was able to understand the intentions of the other (the calf in the first case, and Elspeth in the second) – i.e. to either climb out of or into the water – and they could adjust their own behaviour in order to counteract the problem being faced by the other. Whilst humans may act in this helpful manner on a daily basis, such interactions have been recorded for very few non-human animals (Bates et al. 2008b).

43. Experimental evidence from captive African elephants further demonstrates that elephants attribute intentions to others, as they follow and understand human pointing gestures - the only wild animal so far shown to do so spontaneously – and can also read direction information in the trunk movements of other elephants (Smet and Byrne 2020). The elephants understood that the human experimenter was pointing in order to communicate information to them about the location of a hidden object (Smet and Byrne 2013) (See video here). Attributing intentions and understanding another's reference point is central to empathy and theory of mind.

44. Our analysis of simulated oestrus behaviours in African elephants – whereby a

non-cycling, sexually experienced older female will simulate the visual signals of being sexually receptive, even though she is not ready to mate or breed again – shows that these knowledgeable females adopt false oestrus behaviours in order to demonstrate to naïve young females how to attract and respond appropriately to suitable males. The experienced females may be taking the youngsters lack of knowledge into account and actively showing them what to do; an example of true teaching as it is defined in humans. This evidence, coupled with the data showing that they understand the ostensive cues in human pointing, demonstrates that elephants do share some executive theory of mind skills with humans, namely understanding the intentions and knowledge states (minds) of others. (Ostension is the way that we can "mark" our communications to show people that that is what they are. If you do something that another copies, that's imitation; but if you deliberately indicate what you are doing to be helpful, that's "ostensive" teaching. Similarly, we may "mark" a joke, hidden in seemingly innocent words; or "mark" our words as directed towards someone specific, by catching their eye. Ostension implies that the signaler knows what they are doing).

45. Further related to empathy, coalitions and cooperation have been documented in wild African elephants, particularly to defend family members or close allies from (potential) attacks by outsiders, such as when a family group tries to 'kidnap' a calf from an unrelated family (Lee 1987; Moss and Poole 1983). These behaviours are based on one elephant understanding the emotions and goals of the coalition partner (Bates et al. 2008b).

46. Cooperation is also evident in experimental tests with captive Asian elephants, whereby elephants demonstrated they can work together in pairs to obtain a reward, and understood that it was pointless to attempt the task if their partner was not present or could not access the equipment (Plotnik et al. 2011) (See video here). Problem-solving and working together to achieve a collectively desired outcome involve mentally representing both a goal

and the sequence of behaviours that is required to achieve that goal; it is based on (at the very least) short-term action planning.

47. Wild elephants have frequently been observed engaging in cooperative problem solving, for example when retrieving calves that have been kidnapped by other groups, or when helping calves out of steep, muddy river banks (Bates et al. 2008b; Moss 1992). These behaviours demonstrate the purposeful and well-coordinated social system of elephants, and show that elephants can hold particular aims in mind and work together to achieve those goals. Such intentional, goal-directed action forms the foundation of independent agency, self-determination, and autonomy.

48. Elephants also show innovative problem solving in experimental tests of insight (Foerder et al. 2011), where insight can be defined as the 'a-ha' moment when a solution to a problem 'suddenly' becomes clear. (In cognitive psychology terms, insight is the ability to inspect and manipulate a mental representation of something, even when you can't physically perceive or touch the something at the time. Or more simply, insight is thinking and using only thoughts to solve problems (Richard Byrne, *Evolving Insight*, Oxford Online Press, 2016[1]). A juvenile male Asian elephant demonstrated just such a spontaneous action by moving a plastic cube and standing on it to obtain previously out-of-reach food. After solving this problem once, he showed flexibility and generalization of the technique to other, similar problems by using the same cube in different situations, or different objects in place of the cube when it was not available (See video here). This experiment again demonstrates that elephants can choose the appropriate action and incorporate it into a sequence of behaviour in order to achieve a goal, which they kept in mind throughout the process.

49. Further observations and experiments also demonstrate Asian elephants' ability to understand goal-directed behaviour (Irie-Sugimoto et al. 2008; Mizuno et al. 2016). When

[1] Available at https://global.oup.com/academic/product/evolving-insight-9780198757078?cc=us&lang=en&.

presented with food that was out of reach, but with some bits resting on a tray that could be pulled within reach, the elephants learned to pull only those trays that were baited with food (Irie-Sugimoto et al. 2008). Success in this kind of 'means-end' task is a demonstration of causal knowledge, which requires understanding not just that two events are associated with each other but also that there is some mediating force that connects and affects the two which may be used to predict and control events. Moreover, understanding causation and inferring object relations may be related to understanding psychological causation, i.e., the appreciation that others are animate beings that generate their own behaviour and have mental states (e.g., intentions).

### D. Communication and social learning

50. Speech is a voluntary behaviour in humans, whereby a person can choose whether to utter words and thus communicate with another. Therefore, speech and language are reflections of autonomous thinking and intentional behaviour. Elephants also use their vocalisations to share knowledge and information with others (Poole 2011). Male elephants primarily communicate about their sexual status, rank, and identity, whereas females and dependents call to emphasise and reinforce their social units. Call types can generally be separated into calls produced by the larynx (such as rumbles) or calls produced by the trunk (such as trumpets), with different calls in each category being used in different contexts (Poole 2011; Poole and Granli 2009; Soltis et al. 2005; Stoeger-Horwarth et al. 2007; Wood et al. 2005). Field experiments have shown that African elephants distinguish between different call types (for example, contact calls – rumbles that travel long distances to maintain associations between elephants that could be several kilometres apart, or oestrus rumbles – that occur after a female has copulated) and these different call types elicit different responses in the listeners. Elephant vocalisations are not simply reflexive, they have distinct meanings to listeners and

they are truly communicative, similar to the volitional use of language in humans (Leighty et al. 2008; Pardo et al. 2019; Poole 1999; Poole 2011; Stoeger & Baotic 2016, 2017).

51. Furthermore, elephants have been shown to vocally imitate the sounds they hear around them, from the engines of passing trucks to the commands of human zookeepers (Poole et al. 2005; Stoeger et al. 2012). Imitating another's behaviour can be demonstrative of a sense of self, as it is necessary to understand how one's own behaviour relates to the behaviour of others.

52. Elephants display a wide variety of gestures, signals and postures, used to communicate information to the audience (Poole and Granli 2011). Such signals are adopted in many different contexts, such as aggressive, sexual, or socially integrative situations, and each signal is well defined and results in predictable responses from the audience. That is, each signal or gesture has a specific meaning both to the actor and recipient. Elephants' use of gestures demonstrates that they communicate intentionally and purposefully to share information with others and/or alter the others' behaviour to fit their own will.

53. Experimental evidence demonstrates that African elephants recognize the importance of visual attentiveness of the intended recipient (in this case, human experimenters) of gestural communication (Smet & Byrne 2014), further supporting that elephants' gestural communication is intentional and purposeful. Furthermore, the ability to understand the visual attentiveness and perspective of others is crucial for empathy and mental-state understanding.

**E. Memory And Categorisation**

54. Elephants have both extensive and long-lasting memories, just as the folk stories and adages encourage us to believe. McComb et al. (2000), using experimental playback of long-distance contact calls in Amboseli National Park, Kenya, showed that African elephants remember and differentiate the voices of at least 100 other elephants. Each adult female elephant tested was familiar with the contact-call vocalizations of individuals from an average

of 14 families in the population. When the calls were from the test elephants' own family, they contact-called in response and approached the location of the loudspeaker and when they were from another non-related but familiar family— that is, one that had previously been shown to have a high association index with the test group— they listened but remained relaxed. However, when a test group heard unfamiliar contact calls (from groups with a low association index with the test group), they bunched together and retreated from the area.

55. McComb et al. (2001) went on to show that this social knowledge accumulates with age, with older females having the best knowledge of the contact calls of other family groups. McComb et al. (2011) also showed that older females are better leaders, with more appropriate decision-making in response to potential threats (in this case, in the form of hearing lion roars). Younger matriarchs under-reacted to hearing roars from male lions, elephants' most dangerous predators. Sensitivity to the roars of male lions increased with increasing matriarch age, with the oldest, most experienced females showing the strongest response to this danger. These experimental studies show that elephants continue to learn and remember information about their environments throughout their lives, and this accrual of knowledge allows them to make better decisions and better lead their families as they grow older.

56. Further demonstration of elephants' long-term memory comes from data on their movement patterns. African elephants are known to move over very large distances in their search for food and water. Leggett (2006) used GPS collars to track the movements of elephants living in the Namib Desert. He recorded one group traveling over 600 km in five months, and Viljoen (1989) showed that elephants in the same region visited water holes approximately every four days, even though some of them were more than 60km apart. Elephants inhabiting the deserts of both Namibia and Mali have been described traveling hundreds of kilometers to arrive at remote water sources shortly after the onset of a period of rainfall (Blake et al. 2003; Viljoen 1989), sometimes along routes that researchers believe have not been used for many

years. These remarkable feats suggest exceptional cognitive mapping skills, reliant on the long-term memories of older individuals who traveled that path sometimes decades earlier. Indeed, it has been confirmed that family groups with older matriarchs are better able to survive periods of drought. The older matriarchs lead their families over larger areas during droughts than those with younger matriarchs, again apparently drawing on their accrued knowledge (this time about the locations of permanent, drought-resistant sources of food and water) to better lead and protect their families (Foley et al. 2008).

57. Significantly, it has recently been shown that long-term memories, and the decision-making mechanisms that rely on this knowledge, are severely disrupted in elephants who have experienced trauma or extreme disruption due to 'management' practices initiated by humans. Shannon et al. (2013) demonstrated that elephants in South Africa who had experienced trauma decades earlier showed significantly reduced social knowledge. During historic culling practices, juvenile 'cull-orphan' elephants were forcibly separated from family members and subsequently translocated to new locations. Two decades later, they still showed impoverished social knowledge and skills, with impaired decision-making abilities compared to elephants from an undisturbed population in Kenya. Disrupting elephants' natural way of life has substantial negative impacts on their knowledge and decision-making abilities, much as it can with humans.

58. Elephants demonstrate advanced 'working memory' skills. Working memory is the ability to temporarily store, recall, manipulate, and coordinate items from memory. Working memory directs attention to relevant information, and results in reasoning, planning, and coordination and execution of cognitive processes through use of a 'central executive' (Baddeley 2000). Adult human working memory is generally thought to have a capacity of around seven items. In other words, we can keep about seven different items or pieces of information in mind at the same time (Miller 1956). We conducted experiments with wild

elephants in Amboseli National Park, Kenya, manipulating the location of fresh urine samples from related or unrelated elephants. The elephants' responses to detecting urine from known individuals in surprising locations showed that they are able to continually track the locations of at least 17 family members in relation to themselves, as either absent, present in front of self, or present behind self (Bates et al. 2008c). This remarkable ability to hold in mind and regularly update information about the locations and movements of a large number of family members is best explained by the fact that elephants possess an unusually large working memory capacity, apparently much larger than that of humans.

59. Elephants show sophisticated categorisation of their environment, with skills on a par with those of humans. We experimentally presented the elephants of Amboseli National Park, Kenya, with garments that gave olfactory or visual information about their human wearers - either Maasai warriors (men who traditionally attack and spear elephants on occasion as part of their rite of passage), or Kamba men (who are agriculturalists and traditionally pose little threat to elephants). In the first experiment, the only thing that differed between the cloths was the smell, derived from the ethnicity and/or lifestyle of the wearers. The elephants were significantly more likely to run away when they sniffed cloths worn by Maasai men than those worn by Kamba men or no one at all (See video here). In a second experiment, we presented the elephants with two cloths that had not been worn by anyone, but here one was white (a neutral stimulus) and the other was red—the color that is ritually worn by Maasai warriors. With access only to these visual cues, the elephants showed significantly greater reaction to red garments than white, often including signs of aggression. We concluded that elephants are able to categorize a single species (humans) into sub-classes (i.e. 'dangerous' or 'low risk') based on either olfactory or visual cues alone (Bates et al. 2007). McComb et al. went on to show that the same elephants can also distinguish between human groups based on our voices. The elephants reacted differently (and appropriately) depending on whether they heard Maasai

or Kamba men speaking, and also when they heard male or female Maasai (where female Maasai pose no threat as they are not involved in spearing events), and adult Maasai men or young Maasai boys (McComb et al. 2014). Scent, sounds and visual signs associated specifically with Maasai men are categorized as 'dangerous', while neutral signals are attended to but categorized as 'low risk'. Two captive Asian elephants have also recently been shown to differentiate between familiar and unfamiliar humans based on visual and olfactory signals (Polla et al. 2018). Asian elephants have also shown remarkable skills in judging quantities, using both visual and olfactory information (Irie et al. 2019; Plotnik et al. 2019), leading to the statement in one peer-reviewed paper that elephants 'have cognitive characteristics partially identical to human counting' (Irie et al. 2019). These sophisticated, multi-modal categorization and numerical skills may be exceptional among non-human animals. Moreover, these experiments demonstrate elephants' acute sensitivity to the human world – monitoring our behavior and learning to recognize when we might cause them harm.

**III. Conclusion**

60. Both African and Asian elephants demonstrate highly adapted cognitive abilities, and share many key traits of advanced cognition and autonomy with humans. Based on the evidence, it is clear to us they should also be considered autonomous beings.

61. Scientific knowledge about elephant intelligence has been increasing rapidly in the past decade: what we currently know is only a tiny fraction of what elephant brains are likely capable of, and yet more amazing abilities are still likely to be discovered.

I declare under penalty of perjury under the law of the Commonwealth of Pennsylvania that the foregoing is true and correct.

Signed on the..10th..day of..JULY.....,

at..PORTSMOUTH.....,

(date)...10...(month)..07..(year)..2025....

(county or other location, and state)..PORTSMOUTH,

...HAMPSHIRE.....

(country).....U.K.....

(printed name).....LUCY...BATES.....

(signature).....

I declare under penalty of perjury under the law of the Commonwealth of Pennsylvania that the foregoing is true and correct.

Signed on the 6th day of May,

at St Andrews,

(date) 6 (month) 5 (year) 2025

(county or other location, and state)

Fife

(country) UK

(printed name) RICHARD BYRNE

(signature) R.W.Byrne

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## EMPLOYMENT

**Oct 2019 – Present**
**Associate Lecturer, School of Psychology, The Open University**
Tutoring on final year 'Investigating Psychology' research module for undergraduate students. (0.2FTE)

**Jan 2018 – Present**
**Visiting Research Fellow, School of Psychology, University of Sussex**
Continuing *Culture in elephants* research project; finalizing publications, developing future funding proposals, continuing to supervise related MSc and BSc research projects and deliver lectures. (0.6FTE)

**Jan 2016 – Jan 2018**
**Daphne Jackson Research Fellow, School of Psychology, University of Sussex**
*Culture in elephants? Exploring social traditions across elephant populations*
Conceived, designed and led survey-based, collaborative research project working with 10 independent elephant research sites across east and southern Africa, supervised by Prof. Karen McComb. (0.5FTE)

**Oct 2012 – Dec 2015**
Maternity leave for my two children born in 2012 and 2014.

**Jun 2008 – Present**
**Director, Elephant Specialist Advisory Group (ESAG), South Africa** (0.2 FTE since 2012)
**Freelance Elephant Conservation Advisor, Pretoria, South Africa**
Committee member advising national and local government on elephant management and conservation policy. Consultancy including report writing, assessment, analysis for: Save the Elephants, Kenya; Ezemvelo Kwa Zulu Natal Wildlife, South Africa; and Society for the Prevention of Cruelty to Animals, Zimbabwe.

**Mar 2005 – May 2008**
**Research Fellow, School of Psychology, University of St Andrews**
*Leverhulme Trust funded project: Socio-Cognitive skills of the African Elephant*
Designed, conducted and published high-impact experimental and observational field research exploring elephant cognition and social skills in Amboseli, Kenya; grant co-written with PI Prof. Richard Byrne.

## EDUCATION

**Nov 2001 – Mar 2005**
**PhD Evolutionary Psychology, School of Psychology, University of St Andrews**
Title: *Travel and food location by chimpanzees of the Budongo Forest Reserve, Uganda*
Supervised by Prof. Richard Byrne. Supported by a BBSRC Studentship.

**Oct 2000 – Oct 2001**
**MSc Human Biology, Institute of Biological Anthropology, University of Oxford**
Dissertation: *Gregariousness in female chimpanzees of the Budongo Forest Reserve, Uganda*
Supervised by Prof. Vernon Reynolds.

**Oct 1997 – Jun 2000**

**BA (Hons) Experimental Psychology, Oriel College, University of Oxford**

Papers completed: Animal Behaviour; Biology of Learning and Memory; Brain and Behaviour; Individual Differences; Memory and Cognition; Perception; Social Psychology.

## RESEARCH

### *Publications* h-index: 16

**Bates LA** (2020) Cognitive abilities in elephants. In: *The Cambridge Handbook of Evolutionary Perspectives on Human Behaviour*. Eds. L. Workman, W. Reader & J. Barkow. Cambridge University Press, Cambridge.

van der Water A, Henley M, **Bates LA** & Slotow R (2020) A transformative conservation future for Thailand's captive elephants: A commentary on Baker & Winkler Elephant Rewilding. Animal Sentience.

**Bates LA** & Byrne RW (2019) The Evolution of Intelligence: Reconstucting the Pathway to the Human Mind. In: *The Cambridge Handbook of Intelligence*, 2nd Edition. Ed. R. Sternberg. Cambridge University Press, Cambridge.

Pretorius Y, Garai M & **Bates LA** (2018) The status of African elephant *Loxodonta africana* populations in South Africa. *Oryx*. doi:10.1017/S0030605317001454.

Garai ME, **Bates LA**, Bertschinger H, Delsink A, Pretorius Y, Selier J, Zitzer HR (2018) Non-lethal elephant population control methods: Summary of the first workshop of the Elephant Specialist Advisory Group of South Africa. *Bothalia – African Biodiversity and Conservation* 48 (2) a2357.

**Bates LA** (2018) Elephants – Studying Cognition in the African Savannah. In: *Field and Laboratory Methods in Animal Cognition.* Eds. N. Bueno-Guerra & F. Amici. Cambridge University Press, Cambridge.

**Bates LA** & Byrne RW (2014) Primate Social Cognition: What we have learned from nonhuman primates and other animals. In: *APA Handbook of Personality and Social Psychology Vol. 1. Attitudes and Social Cognition*. Eds. M.Mikulincer & P.R. Shaver. APA, Washington, DC.

Byrne RW & **Bates LA** (2011). Elephant cognition: What we know about what elephants know. In: *The Amboseli Elephants: A long-term perspective on a long-lived mammal*. Edited by CJ Moss, H Croze, & PC Lee. University of Chicago Press, Chicago.

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Byrne RW & **Bates LA** (2010) Primate social cognition: uniquely primate, uniquely social, or just unique? *Neuron* 65 815-830.

**Bates LA** & Byrne RW (2010) Imitation: what animal imitation tells us about animal cognition. *WIREs Cognitive Science* 1 (5) 685-695.

**Bates LA** & Byrne RW (2009) Sex differences in the movement patterns of free-ranging chimpanzees: foraging and border checking. *Behavioral Ecology and Sociobiology* 64 247-255.

Byrne RW, **Bates LA** & Moss CJM (2009) Elephant cognition in primate perspective. *Comparative Cognition and Behavior Reviews* 4 1-15.

Byrne RW, Noser RG, **Bates LA** & Jupp PE (2009) How did they get here from there? Detecting changes of direction in terrestrial ranging. *Animal Behaviour* 77 (3) 619-631.

**Bates LA,** Lee PC, Njiraini N, Poole JH, Sayialel K, Sayialel S, Moss CJ & Byrne RW (2008) Do elephants show empathy? *Journal of Consciousness Studies* 15 (10-11) 204-225.

**Bates LA,** Sayialel K, Njiraini N, Poole JH, Moss CJ & Byrne RW (2008) African elephants have expectations about the locations of out-of-sight family members. *Biology Letters* 4 (1) 34-36.

**Bates LA**, Poole JH, & Byrne RW (2008) Elephant cognition: A Quick Guide. *Current Biology* 18 (13) R544-R546.

**Bates LA,** Sayialel K, Njiraini NW, Poole JH, Moss CJ & Byrne RW (2007) Elephants classify human ethnic groups by odour and garment colour. *Current Biology* 17 (22) 1938-1942.

Byrne RW & **Bates LA** (2007). Sociality, Evolution and Cognition. *Current Biology* 17 (16) R714-723.

**Bates LA** & Byrne RW (2007). Creative or created: Using anecdotes to investigate animal cognition. *Methods* 42 (1) 12-21.

Byrne RW & **Bates LA** (2007) Animal Brain Evolution: When is a group not a group? *Current Biology* 17 (20) R883-R884.

Byrne RW & **Bates LA** (2006) Why are animals cognitive? *Current Biology* 16 (12) 445-448.

**Bates LA** & Chappell J (2002). Inhibition of optimal behaviour by social transmission in the guppy depends on shoaling. *Behavioural Ecology* 13 827-831.

## *Popular Books*

Wood L (2020) *The Last Giants.* Hodder, London.

ESAG (Garai ME, **Bates LA,** Pretorius Y, Hofmeyr M, Henley M, Selier J) (2017) *Understanding Elephants: Guidelines for safe and enjoyable elephant viewing.* Struik Nature: South Africa.

## *Oral Presentations (selected)*

**Keynote presentation:** Bates, LA (2019) The role of women in conservation and ethology. *Workshop: Herding together for conservation,* organised by Elephants Alive, Elephants for Africa and Southern African Conservation Trust, **Hoedspruit, South Africa.**

**Invited Presentation:** Bates, LA (2018) Elephant conservation: Does culture have a role to play? *Workshop: The Conservation Applications of Research on Elephant Behaviour and Ecology,* **Wissenschaftskolleg zu Berlin, Germany.**

**Invited Presentation:** Bates, LA (2017) Culture in elephants? *Daphne Jackson Trust Research Conference,* **Royal Society, London, UK.**

**Plenary Lecture:** Bates, LA (2017) Studying elephant minds: What can primatologists learn? *Primate Society of Great Britain Spring Meeting,* **Manchester, UK.**

Bates, LA (2010) Using observational data to study cognition: elephants and primates. *International Primatology Society XXIII Congress,* **Kyoto, Japan.**

**Invited Presentation:** Bates, LA (2009) Social knowledge in African elephants.
*Department of Zoology & Entomology,* **University of Pretoria, South Africa.**

Bates, LA (2006) Travel and food location in chimpanzees.
*Animal Behaviour Society Conference,* **Utah, USA.**

## *Funding Obtained*

**Apr 2016**
**University of Sussex Research Development Fund**
**£8,200.** Wrote application for support including temporary Research Assistant and field-trip expenses.

**Jan 2016**
**Daphne Jackson Trust Research Fellowship, University of Sussex**
**0.5FTE salary plus £10,000 research expenses.** Conceived & wrote application for fellowship research.

**Mar 2005**
**Leverhulme Trust Research Project Grant - Named Post-Dcotoral Fellow**
**£102,000.** Prepared and wrote application with PI Prof. Richard Byrne.

**Oct 2001**
**Biotechnology and Biological Sciences Research Council PhD Studentship**
**Full funding award,** including fees, stipend and field-work expenses.

# TEACHING

## *Student Supervision and Examining*

**Oct 2019 – Present**
**Research Methods and BSc research projects, School of Psychology, The Open University**
Teaching on final year *Investigating Psychology* module. Supervising BSc research projects on topics within Individual Differences and Social Psychology and writing lectures delivered both face-to-face and online.

**Sep 2016 – Present**
**Co-supervising PhD, MSc and BSc research projects, School of Psychology, University of Sussex**
Supervised 11 BSc Honours projects, four MSc projects and two PhD projects (ongoing) on various topics detailing elephant cognition and behaviour.

**Oct 2016**
**External examiner for MSc thesis, Faculty of Natural and Agricultural Sciences, University of Pretoria, South Africa.** Thesis title: Social organisation of African elephants in Pilanesberg.

## *Lectures and Seminars*

**Feb 2017, 2018, 2019**
**Lectures: *Animal Culture*, Psychology Now 2nd year module, University of Sussex**
Devised and delivered two lectures; devised essay questions and marking scheme, supervised calibration.

**Feb 2016**
**Lectures: *Primate Cognition*, Psychobiology 1st year module, University of Sussex**
Delivered two lectures previously prepared by Prof. Karen McComb.

**Mar 2006 & 2007**
**Seminar series: *Evolutionary Psychology*, School of Psychology, University of St Andrews**
Led seminars tied to associated second-year lecture course by Prof. Richard Byrne.

## DEVELOPMENT, TRAINING AND ENGAGEMENT

**Jul 2019 – Oct 2019**

**Researched, planned, drafted popular science book 'The Last Giants' for Mr Levison Wood.** Wrote complete first draft of this book at the request of the named author and edited subsequent drafts.

**Aug 2017 – Aug 2018**

**Supervising student research project for Junior Science Symposium, Briarcliff High School, New York State, USA.** Supervising internet-based research project on tool-use in elephants for student participating in USA-wide high school science competition.

**Jan 2016 – Nov 2017**

**Daphne Jackson Trust and University of Sussex training courses: Funding and professional skills; Leadership skills; Media and PR skills; Presentation skills; Time-management and work-life balance.** Completing courses which have eased the transition back to academia and enhanced my professional development, readying me for the multi-facted challenges of a lectureship role.

**Oct 2007 – Present**

**Media interviews about my research, Numerous internet, print, radio, and tv media.** Including for: *BBC One*; *BBC World Service*; *Discovery Channel*; *National Geographic*; *New Scientist*; *Off the Fence Productions*; *Radio New Zealand; Scientific American*; *The Guardian*; *The Times*; *The Psychologist; Tortoise*.

## ADMINISTRATION

**Jan 2016 – Present**

**Member of working group '*Culture and Social Complexity*', Convention on the Conservation of Migratory Species (UNEP-CMS).** Analysing the conservation implications of culture in priority species.

**Oct 2015 – Present**

**Member of working groups: '*Translocating elephants*', '*Elephant welfare*' and '*Policy and legislation*', ESAG.** Ensuring activities in these areas are compatible with latest scientific knowledge.

**Oct 2003 – Present**

**Peer reviewing,** Reviewed manuscripts and book proposals for numerous international journals and publishers, including *Animal Cognition*, *Animal Behaviour*, *Biology Letters* and *Current Biology*.

**Mar 2011**

**Co-editor of Special Feature 'Cognition in the Wild', *Biology Letters*,** with Prof. Richard Byrne.

**Sep 2010**

**Symposium Co-ordinator: 'Cognition in the Wild', IPS XXIII Congress, Kyoto, Japan.** Proposed and organised symposium with Prof. Richard Byrne, involving eight speakers.

**Exhibit B**

References cited


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Bates L.A., J.H. Poole & R.W. Byrne (2008a) Elephant cognition. *Current Biology* **18** (13): R544-R546.

Bates L.A., P.C. Lee, N. Njiraini, J.H. Poole, K. Sayialel, S. Sayialel, C.J. Moss & R.W. Byrne (2008b) Do elephants show empathy? *Journal of Consciousness Studies* **15** (10-11): 204-225.

Bates L.A., K. Sayialel, N. Njiraini, J.H. Poole, C.J. Moss & R.W. Byrne (2008c) African elephants have expectations about the locations of out-of-sight family members. *Biology Letters* **4** (1): 34-36.

Bates L.A. & R.W. Byrne (2014) Primate Social Cognition: What we have learned from nonhuman primates and other animals. In: *APA Handbook of Personality and Social Psychology Vol. 1. Attitudes and Social Cognition*. Eds. M.Mikulincer & P.R. Shaver. APA, Washington, DC.

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Wood, J.D., B. McCowan, W.R. Langbauer, J.J. Viloen & L.A. Hart (2005) Classification of African elephant *Loxodonta africana* rumbles using acoustic parameters and cluster analysis. *Bioacoustics*, **15**: 143–161.

**Richard William Byrne FRSE** Emeritus Professor
6th September 2018 University of St Andrews

## Education

1969-1972 M.A. in Natural Sciences, St John's College, Cambridge (1st Class Honours)
1972-1975 Ph.D., University of Cambridge, *"Memory in complex tasks"*

## Career

1976-1991 Lecturer in Psychology, University of St Andrews
1991-1997 Reader in Psychology, University of St Andrews
1997-2017 Professor of Evolutionary Psychology, University of St Andrews

## Awards

1972 Wright Prize & Hughes Prize*, St Johns College, Cambridge*
1972-1975 MRC Studentship, tenure at MRC Applied Psychology Unit, Cambridge
1993 *Association of Commonwealth Universities*: Development Fellowship
1997 *British Psychological Society*: Book Award
2001 *Collegium Budapest*: Institute of Advanced Study. Awarded *Convenorship* of Focus Group 2003 "Precursors to Culture".
2002 Elected Fellow of the *Royal Society of Edinburgh*
2007 Elected Fellow of the *Higher Education Academy*
2017 *British Psychological Society*: Research Board Lifetime Achievement Award 2017

## Professional activities (since 2000)

**Focus Group Convenor**, *Precursors to Culture*, Collegium Budapest Institute Advanced Studies, Hungary. Oct-Dec 2003.
**Boyd Group** Member of Subgroup on *Use of non-human primates in research and testing.* 2000-2002
**Vice-President**, *International Primatological Society* 1996 – 2001
**National teaching:** *Quality Assurance Agency/ Scottish Higher Education Funding Council*: Steering Committee for Assessment (2003-5)

## H-Index: 64 (H-Index since 2013: 43)

## Scottish Primate Research Group

In 1987 I set up (with McGrew, Stirling; Rogers, Edinburgh; Whiten, St Andrews) the *Scottish Primate Research Group*, to co-ordinate the cognate research interests of the 3 centres, promote new joint grant applications, encourage outside visitors to Scotland and postgraduate admissions, and co-ordinate joint seminars and lectures. The *Scottish Primate Research Group* now attracts international notice (e.g. US researchers coming to spend Sabbatical with Group), and it is now larger and more productive than ever, with 21 faculty members and over 50 researchers.

## Fieldwork Periods

Mont Assirik, Senegal. January-April 1979. (Guinea baboon *Papio papio*)
Giant's Castle Game Reserve, South Africa. August-December 1983. (Chacma baboon, *Papio ursinus*)
Mahale Mountains, Tanzania. July-December 1984. (Chimpanzee, *Pan troglodytes*)
Virunga Volcanoes, Rwanda. July-December 1989. (Mountain gorilla, *Gorilla b. beringei*)
Mbeli Bai, Republic of Congo. August-October 2010. (Western gorilla, *Gorilla g. gorilla*)

## Editorial work (since 2000)

*Current Biology,* **Editorial Board**, 2006 - present
*Biology Letters,* **Editorial Board**, 2007 - 2013
*Animal Cognition,* **Editorial Board**, 1997 - 2011
*Animal Behaviour,* **Consulting Editor**, 1996 – 2000
*Journal of the Royal Anthropological Institute,* **Editorial Board**, 1995 - 2010
Refereeing of **book proposals**: Basil Blackwell, Cambridge University Press, Curzon Press, Lawrence Erlbaum Associates, Oxford University Press, John Wiley.
(And refereeing of **manuscripts**: numerous journals, including Science, Nature, PNAS, Proc.Roy.Soc.B., Phil.Trans.B , TICS, TINS, Psychological Science, Psychological Bulletin, Current Biology.)
Refereeing of **promotion applications***:* Arizona State University; University of California, San Diego; University of Colorado; University of Florida, Gainsborough, FL; Max Planck Institute for Evolutionary Anthropology, Leipzig; Miami University, Ohio; University of Natal, RSA; University of Portsmouth, UK; University of Stirling, UK; York University, Toronto
Refereeing of **research grants**: BBSRC, ESRC, Israel Academy of Sciences and Humanities (Basic Research Foundation), L S B Leakey Foundation (Oakland, California), Leverhulme Trust, MRC, NSF (USA), NERC, NSERC (Canada)
Refereeing of **research programmes**: Leverhulme Trust, Max-Planck-Society, Germany, Earthwatch Europe

**Major invited lectures (since 2000)**

2018 *The Royal Institution, London.* (**Public lecture and discussion**, 8th November)

2016 *University of Emory, Atlanta.* (**Public lecture**, 12th April)

2015 *85th James Arthur Lecture*, *American Museum of Natural History.* (**Public lecture**, 5th March)

2013 *Tarragona Laterality Conference.* (Invited lecture to Closed Conference)
*University of Portsmouth.* (**Public lecture**, 25th April)

2012 *Institute of Evolutionary Biology, University of Zurich.* (Invited lecture in Workshop, *Unpacking intentionality in animal vocal communication: an integrative approach*.)

2011 *John Templeton Foundation.* (Invited lecture to Symposium, *The Emergence of Personhood* )
*Hanse-Wissenschaftskolleg, Delmenhorst.* (Closed Workshop, *The evolution of human handedness*)
*Institute of Evolutionary Biology, University of Zurich.* (**Public lecture**, 29th September)

2010 *INCORE Thematic Meeting, Berlin.* (Workshop, *Referential communication)*

2009 *German Society for Primatology* (**Plenary lecture**, 11th Congress, Hanover)
*Year of Darwin Lecture, School of Biosciences, Birmingham University* (**Public lecture**)
*Max Planck Institute for Evolutionary Anthropology, Leipzig.* (Workshop, *Understanding Tool Use*)

2008 *Institute of Cognitive Sciences, Montréal.* (Invited lecturer, Summer School on *Social Cognition)*

2007 *University of Vienna, Faculty of Life Sciences.* (Inter-faculty series, "The evolution of social cognition")
*European Federation of Primatology.* (**Plenary lecture**, Second Congress, Charles University Prague)
*MRC / Cold Spring Harbor.* (Invited lecturer, Workshop on *Social Cognition*, St Anne's College, Oxford)
*Carlsberg Academy,* Copenhagen. (**Plenary lecture**, conference *Missing Links*)

2006 *The Royal Society, London.* (Symposium, *From Brain to Culture*)
*Japan Society for Animal Psychology* (**Plenary lecture**, 66th Annual Meeting, Kyoto.)

2005 *Portuguese Primatological Association, 2nd Int. Conf.* (**Plenary lectures** to conference, Lisbon)
*University of Tokyo, "Evolutionary Cognitive Sciences" series* (Lecture)

2004 *Institute of Cognitive & Decision Sciences, University of Oregon.* (**Public Lecture**).
*Wenner-Gren Foundation for Anthropological Research.* (Closed conference "Roots of Human Sociality", North Carolina.)

2003 *European Workshop in Cognitive Neuropsychology.* (International workshop, Bressanone, Italy.**)**

2002 *University of Oxford, McDonnell-Pew Centre Centre.* (Annual Autumn School in Cognitive Neuroscience.)
*Perspectives on Imitation.* (International workshop, Royaumont Abbey, France.)
*University of Oxford, McDonnell-Pew Centre for Cognitive Neuroscience.* (Theme "Rational animals?" Autumn School)
*Fundació "la Caixa" Museum of Science, Barcelona; & Social & Cultural Centre, Tarragona* (**Public lectures**)

2001 *VIIth European Congress of Psychology.* (**Keynote address** to Congress, forming part of BPS Centenary, London.)
*Institute of Cognitive Neurology.* (Symposium, "Human Cognition", UCL, London.)
*British Association for the Advancement of Science.* (Lecture, **press conference**. "Constraints on Culture", Glasgow.)
*British Psychological Society.* (**Keynote lecture**, Consciousness & Experiential Psychology section.)
*Knapping Stone: a uniquely hominid behaviour?* (International workshop, Abbaye des Prémontrés, France.)
*Malingering & Illness Deception.* (International workshop**,** Blenheim, Oxford.)

2000 *British Neuropsychiatry Association.* (**Plenary lecture** to Millennial Meeting, "The social brain")
*International Congress for Cognitive Science.* (**Invited main lecture**, "Primate Cognition", Inuyama.)
*Gaia Research Project.* (Symposium, "Animal Architecture", Edinburgh.)
*Sorbonne University.* (Workshop, "Cognitive Science", Paris.)
*The Royal Society of Edinburgh.* (International Conference, "Human Nature", Edinburgh.)
*Max Planck Institute, Andechs.* (Symposium, "The Social Brain", Bochum.)
*University of Ghent***.** (Symposium, "Science and Philosophy of Pain", Gent.)

**Additional invited, funded talks at:** Auckland University (Psychology, Zoology); BAAS SET7 Week (St Andrews); Gesamthochschule, Kassel (Primatenbiologie); Deutsches Primatenzentrum, Gottingen; Duke University, North Carolina (Biological Anthropology); Dundee University (teaching forum); Durham University (Psychology, Anthropology); Eötvos Lorand University, Budapest (Ethology); Hang Sen Centre for Cognitive Studies, Sheffield (twice); Hawaii University, Honolulu (Psychology); Kyoto University; Living Links Center, Emory University; MRC Cognitive Brain Research Unit, Cambridge (twice); Max Planck Institute, Leipzig; Max Planck Institute, Seewiesen, Bavaria; Miami University, Ohio (Zoology); University of Otago, New Zealand (Psychology); Queens University, Kingston Ontario (Psychology); Université de Rennes 1 (Zoology); Royal Anthropological Institute, London; Royal (Dick) School of Veterinary Studies, Edinburgh; Yerkes Regional Primate Research Center, Atlanta GA; UCSD (Psychology); York University, Toronto (Psychology); Universities of Aberdeen (Psychology), Abertay (Psychology), Cambridge (Psychology, Archaeology & Anthropology), Durham (Psychology, Anthropology), Edinburgh (Psychology, Zoology), Exeter (Psychology), Leeds (Psychology), Liverpool (Psychology, Zoology), Manchester (Psychology), Oxford (Zoology), Oxford Brookes (Anthropology), Reading (Archaeology), St Andrews (Divinity, Modern Languages, Zoology, Psychology), Stirling (Psychology), UCL (Archaeology), Sussex (Neuroscience & Robotics), York (Centre for Human Palaeontology & Human origins); Zoological Society of London.

**Broadcasting** (since 2000)

*BBC1 6 O'Clock News (Scotland)* interview on own great ape research 2008; *6 O'Clock news (UK)* interview on own elephant research 2013

*BBC2 "The Secret Life of Pigs"* (consultant 2010)

*BBC World/BBC4 Evening News* interview on own elephant research 2013

*ITV/STV (ITN News)* interview on own elephant research (2013)

*Australian ABC Channel TV* (programme on my research in *Catalyst* series)

*BBC Radio 4 "Today"* (interviews 2008, 2000)

*BBC Radio 4* Interview with Jonathan Miller, *Self-made things* (2005)

*Australian Radio* (article on own research in "The Science Show", 2001); *Radio Netherlands* (article on own research, 2001)

Numerous other interviews on own research: *ABC Radio Australia, Austrian Broadcasting Corporation, US Public Broadcasting Network, Breakfast Radio Auckland (NZ), Radio Canada, Western Australia Radio, Discovery Canada, Radio New Zealand "Morning Report" Radio Ireland, Talkback Radio (Ireland),BBC World Service, BBC Radio Scotland, Radio Wales*, *Radio Cambridgeshire, BBC Radio Jersey, BBC Radio 5 Live*, *Radio Tay, Kingdom FM, Talk 107, Voice of Russia, Wave 102*

**External Postgraduate Examining** (since 2000)

2000 *Ph.D. Oxford Brookes University (Anthropology)* L. Ambrose.
2001 *M*.Sc. *University of Stirling (Psychology)* A Nowell.
2002 *M*.Sc. *University of Durham (Anthropology)* B A Whiting.
*Ph.D. London School of Economics (Psychology)* K Rigby.
2003 *Ph.D. Exeter University (Psychology)* P.Citrynell.
2004 *Ph.D. University of Cambridge (Psychology)* J Dally
*Ph.D. Exeter University (Psychology)* P.Citrynell, re-examination
2005 *Ph.D. University of Cambridge (Psychology)* J Dally
2008 *Habilitation. University of Vienna (Faculty of Life Sciences)* Dr Thomas Bugnyar
2009 *Ph.D. University of Cambridge (Psychology)* C Bird
2012 *Ph.D. University of Cambridge* (Archaeology & Anthropology) P Bertolani
*Ph.D. University of Birmingham (Psychology)* J Trosciano
2016 *Ph.D. University of York* (*Psychology*) Alejandra Picard
2017 *Ph.D. University of Lincoln (Psychology)* A Frohnwieser
2018 *PhD Oxford Brookes University (Psychology)* M de Guinea

**PhD Supervision** (since 2000)

1999-04 R Noser (self-funded), "Navigation by chacma baboons within the home-range"
2000-04 R da Cunha (funded by CAPES, Brazil), "Long distance communication of howler monkeys"
2000-04 A Valero (funded by CONACYT, Mexico), "Social interactions of spider monkeys"
2001-05 L Bates (funded by BBSRC), "Foraging skills of female chimpanzees"
2004-08 E Cartmill (funded by Univ. St Andrews) "Gestural communication in great apes"
2005-06 F Moore (joint supervision) "Effects of resource control on female reproductive strategies"
2005-09 A Ruiz (funded by ORS) "Monkeys' understanding of intention and attention"
2007-10 C Hobaiter (funded by own EC grant) "Gestural communication in great apes"
2007-11 C Casar (funded by CAPES, Brasil) "Vocal communication of wild titi monkeys"
2008-12 K Hall (funded by Janet Anderson trust and ORSAS) "Theory of mind in chimpanzees"
2010-14 L Orr (funded by NSF Studentship) "gestural communication in gorillas"
2011-15 A Smet (funded by Univ. St Andrews) "Cognition in the African elephant"
2012-16 B Fallon (self-funded) "Gestural communication by sexually consorting male chimpanzees"
2013-17 K Graham (funded by Univ. St Andrews) "Negotiation of sexual relationships among bonobos"

**Books**

1. Byrne, R W (2016) *Evolving Insight*. Oxford University Press, Oxford.
2. Byrne, R W and Whiten A (Eds.) (1988) *Machiavellian Intelligence: Social Expertise and the Evolution of Intellect in Monkeys, Apes and Humans.* Oxford University Press, Oxford; 413 pages. [Japanese edition published by Nakanishiya Shuppan Press, Kyoto, 2004.]
3. Byrne, R W (1995) *The Thinking Ape: evolutionary origins of intelligence.* Oxford University Press, Oxford; 266 pages. [*British Psychological Society* Book Award 1997. Reprinted annually; Japanese edition published by Otsuki Shoten, Tokyo, 1998. Chinese edition, in translation, published by Hunan Education Publishing House, 2006.]
4. Whiten, A and Byrne, R W (Eds.) (1997) *Machiavellian Intelligence II: Extensions and Evaluations.* Cambridge University Press, Cambridge; 403 pages. [Japanese edition published by Nakanishiya Shuppan Press, Kyoto, 2004.]

**Refereed Journal Articles**

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