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UNIVERSITY EDUCATION

2004-present

PhD – (submission 2009), School of Archaeology, Classics & Egyptology (SACE), University of Liverpool

Title: **Using finger length ratios (2D:4D) to investigate the influences of prenatal androgens on the evolutionary development of anthropoid social behaviours**

Primary Supervisor: Dr. Anthony Sinclair, SACE

Second supervisor: Dr. Susanne Shultz, School of Biological Sciences

Funding: Self-funded, part-time

This project is affiliated to the British Academy Centenary Research Project - Lucy to

Language: The Archaeology of the Social Brain. A multi-centered project that investigates the evolution of human sociality

1999-2000

MPhil. (research degree), SACE, University of Liverpool

Title: **Costing the landscape using human energy expenditure and hydration needs.**

Supervisor: Dr. Anthony Sinclair

Funding: Self-funded

1995-1998

BSc. (Honours) Evolutionary Anthropology (First Class), SACE, University of Liverpool

BSc. Supervisor: Prof. John Gowlett

Dissertation topic: **Birth mechanisms in Australopithecines**

Supervisor: Dr. Jim Ohman

NURSING EDUCATION

1994 **Diploma in Higher Education** with specialist studies in Intensive Care Nursing
John Moores University, Liverpool, UK

1992 **Registered Midwife (RM)**, York District Hospital, York, UK

1990 **Registered General Nurse (RGN)**, James Cook University Hospital Trust, Middlesbrough, UK

RESEARCH

My research uses the length of 2nd to 4th digit ratio (2D:4D) - a recognised bio-marker for prenatal androgen effect (PAE) – to investigate influences of PAE on primate social behaviour. Foetal sex hormones organise the mammalian phenotype along sex-specific pathways and provide an ontogenetic platform for social development. In humans prenatal androgens appear to influence social learning and social bonding, it is therefore likely that PAE has similar effects on non-human primates. 2D:4D can be correlated with many aspects of sex-specific social behaviour to estimate how changes in prenatal androgens between taxonomic groups may have influenced the evolution of these behaviours. This is the first study to use 2D:4D to investigate differences in these traits (specifically competitive and bonding behaviours) across a broad range of closely related species. The 2D:4D bio-marker provides a novel approach to behavioural research and may have the potential to inform us about the evolutionary development of sociality in the Primate Order. This research targets proximal influences on sociality and is therefore central to the main aims of the Lucy to Language Project.

FIELDWORK EXPERIENCE

Archaeology Fieldwork Seasons

1998;1999;2000 **Makapansgat Middle Pleistocene Research Project**, Makapansgat Valley, South Africa. Field-walking environs of Cave of Hearths and Limeworks, sites of *A. africanus* and *Homo* species. Field-walking supervisor (1999). Data collection for MPhil research

1997;1998 **Beeches Pitt**, Suffolk, UK. Excavation of Middle Pleistocene site (~500Kya) with evidence of Acheulean lithic artifacts and fire

2008 **Carribbean Primate Research Center, Cayo Santiago, Puerto Rico**

Data collection for a study exploring relationships between 2D:4D and dominance-rank data in a group of female macaques and their offspring from the island of Cayo Santiago. This facility is managed by the Caribbean Primate Research Center, Medical Sciences Department, University of Puerto Rico. Collaborators on the project Dr. M. Gerald (University of Puerto Rico) and Christy Hoffman (University of Chicago)

RESEARCH AWARDS

2008 **Jane Moore Prize**. 10th Annual Conference, of the British Association of Biological Anthropologists and Osteoarchaeologists (BABAO), University of Oxford

GRANT AWARDS

2007 BABAO Small Research Project Grant. Awarded for a study investigating relationships between 2D:4D and dominance-rank in female rhesus macaques from Cayo Santiago, Puerto Rico

2006;2007;2008 British Academy Centenary Project, Lucy to Language Project

2007;2008 Departmental funding, University of Liverpool

2004;2005;2006;2007 Graduate School, University of Liverpool. Postgraduate Research Fund

TEACHING

Lecturer (School of Archaeology, Classics and Egyptology)

2007-2008 **Introduction to Hominin Palaeontology** (Level 1), University of Liverpool

2007 **Introduction to Bio-anthropology** (Level 1), University of Liverpool

1999-2000 **Introduction to Anatomy for Archaeologists** Coordinator and tutor for practical component for the module. University of Liverpool

MODULES CONSTRUCTED

Introduction to Physical Anthropology (Level 1)

This module provides an introduction to the broad subject of physical anthropology by examining how human anatomy and development has evolved within a framework of primate evolution. It addresses topics such as evolution of the skull, spine and thorax, upper and lower limbs, alongside embryology and foetal development, sexual differences in anatomy and ageing. A combination of teaching and learning strategies are used; 10 lectures (1 hour) and 10 practical sessions (1 hour). One lecture is partnered with a practical session in which experience is gained measuring and examining primate and human bone specimens. The module is assessed by short essay and writing exam (20 short questions).

Introduction to Hominin Palaeontology (Level 1)

This module aims to provide an introduction to the hominin fossil record, the main areas of research within the discipline (i.e. brain and dental evolution, bipedalism) and some of the methods used to classify and analyse fossils. It uses a combination of teaching and learning strategies; 10 lectures (1 hour), 5 discussion session (1 hour) and 5 practical sessions (1 hour). One lecture is partnered with either 1) a discussion session, in which the group give their opinions on a topical paper or 2) a practical providing hands-on experience in measuring and examining fossil casts, primate and human bone specimens. The module is assessed using a short essay and a practical exam (20 stations each with a specimen and 2-part question).

ADDITIONAL EXPERIENCE

Student support

2008 **Glossary for Evolutionary Anthropology** constructed as part of the e-learning study skill package for the SACE and support information for Introduction to Hominin palaeontology

2004-2008 **Tutorials for BSc. Evolutionary Anthropology**. Provide support undergraduate students

2007-2008 **Dissertation supervision**. Co-supervised dissertation projects (Evolutionary Anthropology BSc.)

Outreach

2006; 2008 **University of Liverpool UCAS Open Day**. Short practical session to introduce Evolutionary Anthropology to prospective students

Teaching Skills - maintaining practice

April 2005 **An Introduction to Essay Marking for Graduate Teaching Assistants**. Workshop in understanding and implementing the University's marking scheme

May 2005 **Teaching Small Groups**. Workshop in how to facilitate learning and improve teaching skills to students in small groups

May 2008 **E-learning and podcasts**. Workshop on new methods of teaching and learning using e-based technology

Administration and organisation

2008-present **Liverpool Evolutionary Anthropology Forum (LEAF)**. Co-organise and host discussion seminars, presentations and updates of research in this discipline being carried out by local researchers.

2006-2007 **Postgraduate Seminar Series Co-organiser**. Organise and host seminars postgraduate speakers to give research seminars on their work.

2006 **Lucy to Language Workshop on Fire**. Co-organiser of 2 day workshop.

RESEARCH PRESENTATIONS

September 2008 **British Academy Centenary Research Project Symposium: Social Brain, Distributed Mind**. Title: *Finger Length Ratios (2D:4D) and early programming of competitive traits in anthropoid*. Co-authors, Dr. Susanne Shultz (School of Biological Sciences, University of Liverpool) and Prof. Robin Dunbar (Department of Evolutionary Cognition, University of Oxford)

September 2008 **10th British Association for Biological Anthropologists and Osteoarchaeologists (BABAO) Conference**, University of Oxford, UK. Title: *Finger length Ratios (2D:4D) and dominance rank in female rhesus macaques from Cayo Santiago, Puerto Rico*

August 2008 **22nd International Primatological Society**, Edinburgh, Scotland. Title: *Finger Length Ratios (2D:4D) and early programming of competitive traits in anthropoid*. Co-authors, Dr. Susanne Shultz (School of Biological Sciences, University of Liverpool) and Prof. Robin Dunbar (Department of Evolutionary Cognition, University of Oxford)

June 2008 **Inaugural meeting of the Northern Primates Society**, University of York. Title: *Finger length ratios (2D:4D), primate social behaviour and taxonomic scaling issue*.

April 2008 **Evolutionary Anthropology Lecture Series**, School of Archaeology, Classics and Egyptology (SACE), University of Liverpool. Title: *Finger length ratios (2D:4D) and dominance rank in female rhesus macaques from Cayo Santiago, Puerto Rico: implication for the study of human sociality*

March 2008 **77th American Association of Physical Anthropologists (AAPA) Conference**, Columbus, U.S.A. Title: *Exploring relationships between finger length ratios and sexual dimorphism in anthropoid*. Co-author Dr. Susanne Shultz (School of Biological Sciences, University of Liverpool)

December 2007 **Primate Society of Great Britain**, Royal Zoological Society of London, London, UK. Title: *Finger length ratios (2D:4D) and prenatal programming of intra-sexual competitive behaviours in anthropoids*. Co-author Dr. Susanne Shultz (School of Biological Sciences, University of Liverpool)

September 2007 **9th BABAO Conference**, University of Reading, UK. Title: *Can finger Length ratios (2D:4D) inform us about social systems in non-human anthropoid primates?* Co-author Dr. Susanne Shultz (School of Biological Sciences, University of Liverpool)

April 2007: **Archaeology Postgraduate Lecture Series**, SACE, University of Liverpool, UK. Title: *Can finger length ratios (2D:4D) inform us about social systems in non-human anthropoid primates?*

April 2007 **76th AAPA Conference**, Philadelphia, U.S.A. Title: *Can finger length ratios (2D:4D) inform us about social systems in non-human anthropoid primates?* Co-author Dr. Susanne Shultz (School of Biological Sciences, University of Liverpool)

September 2006 **8th BABAO Conference**, University of Birmingham, UK. Title: *The length of the 2nd to 4th digit ratio (2D:4D) and its relationship to primate mating systems; preliminary results*. Co-author Prof. John Manning (Department of Psychology, University of Central Lancashire)

July 2006 **British and Irish Association of Zoos and Aquariums (BIAZA) 8th Annual Symposium of Zoo Research**, Colchester Zoo, UK. Title: *The length of the 2nd to 4th digit ratio (2D:4D) and its relationship with primate mating strategies and human cognitive evolution: some preliminary results*. Co-author Prof. John Manning (Department of Psychology, University of Central Lancashire)

March 2006 **Evolutionary Anthropology Lecture Series**, SACE, University of Liverpool, UK. Title: *Finger length ratios and primate mating systems: Can 2D:4D inform us about human social evolution?*

January 2006 **African Genesis Symposium**, University of Witwatersrand, Johannesburg, South Africa. Title: *The length of 2nd to 4th digit length ratio (2D:4D) and its relationships to primate mating systems and humans sociality: some preliminary results*. Co-author Prof. John Manning (Department of Psychology, University of Central Lancashire)

December 2005 **Primate Society of Great Britain**, Natural History Museum, London, UK. Title: *The length of the 2nd to 4th digit ratio (2D:4D) and its relationship to primate mating strategies and the evolution of human sociality*. Co-author Prof. John Manning (Department of Psychology, University of Central Lancashire)

September 2005 7th BABAO Conference, Museum of London, UK. Title: *The length of the 2nd to 4th digit ratio (2D:4D) and its relationship to primate mating strategies and the emergence of human sociality*.

July 2005 BIAZA 7th Annual Symposium of Zoo Research, Twycross Zoo, Warwickshire, UK. Title: *The length of the 2nd to 4th digit ratio (2D:4D) and its relationship to primate mating strategies and the evolution of human sociality*

PUBLICATIONS

Sinclair, A., McCraith, L. and **Nelson, E.** 2003. Understanding hominid landscapes at Makapansgat, South Africa. In Michell, P., Haour, A. and Hobart, J. (Eds) *Researching Africa's Past*. Oxford University School of Archaeology Monograph No. 57. Oxbow Books:11-24

Nelson, E.C. and Manning J.T. 2005. The length of the 2nd to 4th digit ratio (2D:4D) and its relationship to primate mating systems and the evolution of human sociality [Abstract]. *Primate Eye*, 87:29

Nelson, E.C. and Manning J.T. 2006. The length of the 2nd to 4th digit ratio (2D:4D) and its relationship to primate mating systems and human social evolution; preliminary results [Abstract]. *African Genesis: A symposium on hominid evolution in Africa*. Eds: Reynolds, S., Menter, C.G., Robinson, M.S. and Hemmingway. University of Witwatersrand, Johannesburg, South Africa:79

Nelson, E.C., Manning, J.T. and Sinclair, A.G.M. 2006. Using the 2nd to 4th digit ratio (2D:4D) to sex cave art hand stencils: factors to consider. *Before Farming* (on-line version), 2006/1. Article 6: 1-7

Burriss, R.P., Little, A.C. and **Nelson, E.C.** 2006. 2D:4D ratio and its relationship with sexually dimorphic facial characteristics and perceived dominance. *Archives of Sexual Behavior*. DOI 1007/s10508-006-9136-1

Nelson, E.C. and Shultz, S. 2007. Using the length of the 2nd to 4th digit ratio (2D:4D) to investigate the influence of prenatal sex hormones on non-human primate mating systems and human social evolution [Abstract]. *American Journal of Physical Anthropology*, 132:177

Nelson, E. C. and Shultz, S. 2008. Evidence from finger length ratios (2D:4D) of prenatal androgen effects associated with selection for canine size, but not body size in anthropoids [Abstract]. *American Journal of Physical Anthropology*, 46:160

Nelson, E. C. and Shultz, S. 2008. Finger length ratios (2D:4D) and programming of intra-sexual competitive behaviours in anthropoids [Abstract]. *Primate Eye*, 94:16 ISSN 0305-8417

MEMBERSHIPS

Evolutionary Psychology and behavioural Ecology Research Group, University of Liverpool
Liverpool Evolutionary Anthropology Forum (LEAF), University of Liverpool (co-coordinator)

American Association of Physical Anthropologists

British Association for Biological Anthropology and Osteoarchaeology (BABAO)

British Federation of Women Graduates

International Primatology Society

Paleoanthropology Society

Primate Society of Great Britain

Society of Vertebrate Palaeontology

EMPLOYMENT

- 2007-2008 Module tutor ALGY 120 Introduction to Hominin Palaeontology (Level 1), School of Archaeology, Classics and Egyptology (SACE), University of Liverpool, UK
- 2007 Module tutor ALGY 119 Introduction to Bio-anthropology (Level 1), SACE, University of Liverpool, UK. One semester, to cover sabbatical.
- 2004-2005 Demonstrator for AGLY119 Introduction to Bio-anthropology SACE, University of Liverpool, UK
- 1999-2000 Coordinator for practical component of ANAT109 Introduction to Anatomy for Archaeologists Anthropologists, SACE, University of Liverpool, UK. This module was replaced by ALGY 119
- Dec 1992 - Sept 1995 Staff Nurse, Intensive Care Unit Royal Liverpool University Hospital Trust, Liverpool, UK
- June 1991 - Nov. 1992 Student Midwife, York District Hospital Trust, York, UK
- June 1990 - June 1991 Staff Nurse, intensive Care Unit, James Cooke University Hospital Trust (formally South Tees Hospital NOH Trust), Middlesbrough, UK
- Jan 1990 - June 1990 Staff Nurse, Orthopaedic Unit, James Cooke University Hospital Trust, Middlesbrough, UK
- Nov 1986 – Dec 1989 Registered General Nurse Training, James Cooke University Hospital Trust, Middlesbrough, UK
- Oct 1985 - Nov 1986 Statistics Clerk, Cleveland Constabulary, Middlesbrough, UK

REFEREES

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