

Institution: University of St Andrews

Unit of Assessment: A4 – Psychology, Psychiatry and Neuroscience

a. Overview



University of
St Andrews

600
YEARS

The University of St Andrews is a research-intensive institution that regularly ranks among the top 5 universities in UK league tables and is listed in the top 100 universities world-wide (QS rankings, 2013). The School of Psychology & Neuroscience conducts research across four domains: *Origins of Mind*; *Social and Group Processes*; *Perception, Cognition and Action*; and *Cellular and Developmental Neuroscience*. Numerous collaborations occur both within and between these domains. Our research is supported by a range of UK, EU and international funding bodies and industrial partners. During the REF period, the School has greatly expanded, in terms of staff numbers and physical space, and the School has invested heavily in its infrastructure to ensure a successful future.

b. Research strategy

Strategy and aims

The School was ranked 7th in the UK in RAE2008 and has aimed to strengthen its position as one of the best research departments in the UK through continued support and development of our research staff and consolidation of our research groupings, and we continue to contribute extensively to the wider discipline. During the REF period, we have strengthened our research environment through: i) **the integration of 20 new Principal Investigators**; ii) **consolidation and diversification of research expertise**; and iii) **significant investment in our infrastructure**.

- **New recruitments** During the REF period, our number of Principal Investigators (PIs) has increased by 25%, as a result of 13 new appointees, 3 new independent research fellows, and the strategic integration of 4 neuroscience PIs from the School of Biology in 2012, which precipitated the change in the School's name. Over 25% of our current PIs are Early Career Researchers, which provides us with a stimulating mix of both junior and senior research staff.
- **Diversifying our research expertise** Our new appointments have been made across all four research groupings to complement existing strengths and open up new lines of research. For example, our 4 new cognitive neuroscientists conduct research using fMRI imaging and TMS, which has added new techniques to our research portfolio. Our 6 new experimental neuroscientists increase our breadth of research topics, study species and methodologies.
- **Expansion and investment in infrastructure** The School has expanded into two additional research spaces, which have received over £2M investment as experimental neuroscience and human experimental laboratories. We have opened a £1.6M 'Living Links to Human Evolution Research Centre' at Edinburgh Zoo, which provides facilities for studying non-human primate cognition, and our new recruits provide us with access to another world-class primate and child development research facility at the Max Planck Institute for Evolutionary Anthropology, Leipzig.

Future plans and activities

In the next five years, the School will build upon our achievements by supporting the development of our research staff, consolidating our research groupings, enhancing our current strategic partnerships with key user groups and building relationships with new partners. For example:

- We are refurbishing our child development laboratories at a cost of £60k to provide high-quality facilities for the Origins of Mind group. The recent appointment of two internationally renowned professors in this research area has ensured the continued vitality and strength of this group.
- We have made 4 new appointments in the Perception, Cognition and Action grouping, and we have committed to investing in psychophysics and perception research infrastructure. The links

between this area and the School of Computer Sciences are targeted towards future impact.

- We have advertised a lectureship in experimental neuroscience and are further developing our links with the pharmaceutical industry. We are in discussions with the University's Business Innovation Exchange Unit and with organisations that are potential future research partners.

Research groupings and their achievements (Early Career Researcher names are in italics)

i) Origins of Mind

Arnold, Buchsbaum, Byrne, Call, Carpenter, Gomez, Hobaiter, Seed, Whiten, Zuberbühler.

The Origins of Mind group consists of an internationally renowned set of researchers studying the comparative cognition of non-human animals and children. This reputation is built on excellent research outputs (e.g., *Science, Nature, PNAS*) and is reflected in high levels of grant funding – £3.8M during the REF period. Call and Whiten are named in the top 14 most highly cited European researchers in the field of animal behaviour (LabTimes, 2012). The researchers have extensive collaborations with colleagues in the School of Biology (e.g., Healy, Laland, Ruxton), and St Andrews is renowned as a centre of excellence for the study of animal behaviour and cognition.

Key achievements during the REF period

a) *Fellowships, awards and major grants*

Royal Society of Edinburgh Sir James Black Medal (Whiten, 2013); **Fellowship of Royal Society of Edinburgh** (Zuberbühler, 2011); **£2.6M grant from the Templeton Foundation** (Whiten, 2012); **£1.3M ERC New Investigator grant** (Zuberbühler, 2012); **ESRC 'Future Research Leaders' fellowship** (Buchsbaum, 2013-16).

b) *Research publication highlights*

'Potent social learning and conformity shape a wild primate's foraging decisions' (**Science**, Whiten, 2013); 'Chimpanzees know that others make inferences' (**PNAS**, Call, 2011); 'Meaningful call combinations in a non-human primate' (**Current Biology**, Arnold, Zuberbühler, 2008); 'Does the chimpanzee have a theory of mind?' (**Trends in Cognitive Sci**, Call, 2008).

ii) Social and Group Processes

PIs: *Blackwood, Campbell, Cross, Dritschel, MacLeod, Mavor, Noreen, Reicher, Sheikh, Tausch.*

Our researchers have produced new insights into intergroup processes (including crowd behaviour and discrimination), morality and associated emotions (such as guilt and shame), personality, and inhibitory processes in social cognition and memory. The crowd behaviour research has had significant impact on public order policing in the UK and mainland Europe, and the Leverhulme and Scottish Funding Council have supported our research on Government engagement with Muslim communities and the experience of Muslims in airports. Early career awards have been given to our recently recruited staff by the Royal Society of Edinburgh and other academic organisations.

Key achievements during the REF period

a) *Fellowships, awards and major grants*

Fellow of the Royal Society of Edinburgh Young Academy (Tausch, 2011); **Leverhulme Early Career Fellowship** (Blackwood, 2012-15); **'Rising Star' award from Association for Psychological Science** (Tausch, 2011); **Best Student Paper Award, Society of Personality and Social Psychology** (Sheikh, 2010); **ESRC Transformational Grant** (Reicher, 2013-15).

b) *Research publication highlights*

'Beyond prejudice: are negative evaluations the problem and is getting us to like each other more the solution?' (**Behavioral and Brain Sciences**, Reicher, 2012); 'Sex differences in impulsivity: a meta-analysis'; (**Psychological Bulletin**, Cross, 2011); 'The irony of harmony: intergroup contact can produce false expectations for equality' (**Psychological Science**, Tausch, 2009); 'Proscriptive versus prescriptive morality: two faces of moral regulation' (**Journal of Personality and Social Psychology**, Sheikh, 2009).

iii) Perception, Cognition and Action

PIs: *Ales, Balslev, Bowman, V Brown, Foldiak, Harris, Jentzsch, O'Connor, Oram, Otto, Perrett, Quinn, Sprengelmeyer, Vishwanath.*

Our research expertise provides a system-level understanding of human behaviour and cognition, spanning from understanding how perceptual stimuli are detected and processed, to the structure of decision-making and memory processes, and to how the brain translates information into action. By using a combination of human imaging, behavioural, and experimental techniques, our basic research has advanced our understanding of several neuropsychological disorders, including Huntington's and Parkinson's disease, depression, epilepsy and schizophrenia. Our research has received substantial support from the pharmaceutical industry and medical charities.

Key achievements during REF period

a) *Fellowships, awards and major grants*

Royal Society Industry Fellowship (V Brown, 2009-12); **British Academy Wolfson Research Professorship** (Perrett, 2009-12); **Leverhulme Research Fellowship** (Harris, 2011-13); **Fellowship of Royal Society of Edinburgh** (V Brown, 2012); **£1.7M research funding from pharmaceutical companies and medical charities**

b) *Research publication highlights*

'*The neuroanatomy of sub-threshold depressive symptoms in Huntington's disease: a combined DTI and VBM study*' (**Psychological Medicine**, Sprengelmeyer, 2013); '*Noise and correlations in parallel perceptual decision making*' (**Current Biology**, Otto, 2012); '*Eye proprioception used for visual localization only if in conflict with the oculomotor plan*' (**Journal of Neuroscience**, Balslev, 2012); '*The inferior parietal lobule and recognition memory: expectancy violation or successful retrieval?*' (**Journal of Neuroscience**, O'Connor, 2010).

iv) Cellular and Developmental Neuroscience

PIs: *Ainge, G Brown, Doherty, Li, Miles, Sillar, Spencer.*

Our cellular and developmental neuroscientists have provided insights into the development of the spinal cord and locomotor function during early life, the ontogeny of neural systems involved in spatial cognition, the effects of early life stress and hormone exposure on the development of the brain and behaviour, and the molecular mechanisms involved in cell death and neurodegeneration. This research has generated recent publications in high impact journals (e.g., *Science*; *PNAS*) and been funded by several medical charities, including the *Alzheimer's Society*, the *Motor Neuron Disease Association*, *Age Research UK*, and the *Wellcome Trust*.

Key achievements during REF period

a) *Fellowships, awards and major grants*

Alzheimer's Society Fellowship (Doherty, 2008-13), **David Phillips BBSRC fellowship** (Spencer, 2011-14); **Royal Society University Research Fellowship** (Li, renewal 2011-14) ; team member of **NC3Rs CRACK-IT grant** (Miles, 2013); over **£2.3M grant funding from BBSRC and £1M from the Wellcome Trust**

b) *Research publication highlights*

'*Fast silencing reveals a lost role for reciprocal inhibition in locomotion*' (**Neuron**, Li, 2013); '*Development of a spinal locomotor rheostat*' (**PNAS**, Sillar, 2011); '*Development of the spatial representation system in the rat*' (**Science**, Ainge, 2010); '*A cluster of cholinergic premotor interneurons modulates mouse locomotor activity*' (**Neuron**, Miles, 2009).

c. People

i. Staffing strategy and staff development

Appointments and planning for the future

The School's staffing strategy aims to **use our existing strengths to attract outstanding**

researchers who will complement and expand our expertise, and then **support their development as world-class researchers**. The success of this recruitment strategy is evidenced by the recent appointment of **9 Early Career Researchers and 5 more senior colleagues from around the world** (USA, Germany, Australia). We have strategically integrated **4 neuroscience PIs** from the School of Biology in 2012, and the benefits included enhanced opportunities for collaborative, multi-strand research and improved opportunities for postgraduate research training. Given our **excellent staff retention rates**, all of these new additions have resulted in a **25% increase in the number of PIs** in the School. We thus currently have **34 PIs, 3 fixed-term lecturers and 4 independent researchers**, with fellowships funded by the BBSRC, ESRC, Royal Society and Leverhulme Trust. The School consists of a productive mixture of early career staff and more senior researchers, which provides a vibrant research atmosphere and bodes well for our future. Our 4 new appointments in the *Perception, Cognition and Action* grouping, for example, allows us to anticipate future retirements and maintain momentum in this research area.

Research support

A number of key aspects of the School's budget and management structure promote research, and the University provides central support for gaining research funding and developing user links.

i) Financial support via class grants, studentships and research funding All PIs receive a **£1k class grant allocation** from the School budget for basic research support, plus **£1.5k for each postdoctoral researcher** and **each PhD student** in the supervisor's group. The **School PhD studentships** are preferentially allocated to new staff members in situations where applicants are equally strong. The School has budgets for **participant reimbursement** and **pilot fMRI studies**.

ii) Workload model To facilitate *all* staff being research active, a **systematic workload model** requires all PIs to take an equitable teaching and administration workload, with probationary staff carrying out half a standard teaching and administration load.

iii) School and University Research Committees The School's **Research Committee**, chaired by the **Director of Research**, facilitates research within the School. The Director of Research sits on the **School Management Group** and attends the regular **University Research Forum** and **Directors of Research Lunch Meetings**, chaired by the Vice-Principal for Research. The **Research Policy Office** oversees the University's research policy and strategy.

iv) University research support offices The University's **Finance Advice and Support** office provides costings for grant applications. Our dedicated **Business Development Manager** runs monthly 'research clinics' and helps identify funding opportunities. The **Knowledge Transfer Centre** assists with developing links with user groups, as outlined in the University's *Knowledge Transfer Strategy* (2008-13). Our **Contracts Manager** assists with drawing up business contracts. The **University Library** administers several funds for supporting open access publishing.

v) Research events The School organises numerous events and activities that promote research. The **Friday Seminar Series** consists of talks from national and international researchers. The annual **Jeeves Lecture** is given by a world-leading researcher and provides a focus for meeting colleagues from across Scotland. The School runs **postgraduate talks** and an annual **research away-day**, and research-related events form a key part of the **Early Career Researcher Forum**.

vi) Website and public access to research The School's website, re-designed in 2012, provides accessible information about research activities and awards. Media training is provided in-house and research achievements are disseminated as press releases by the University's **Press Office**.

Staff development

i) Staff training courses and events The School runs monthly **staff training sessions**, which cover a range of research-related topics, such as how to obtain funding and how to implement risk assessments. The University's **Centre for Academic, Professional and Organisational Development** (CAPOD) also provides a full range of staff development courses and allocates

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grants for attendance at external training events. All supervisors of research students and staff are required to attend **supervisor training events** to receive updates on supervision best practices.

ii) Annual review procedures Each Principal Investigator (PI) has an annual review meeting with the Head of School, at which career aspirations and goals are discussed. All members of contract research staff undergo an annual progress meeting with their PI, which includes career planning.

iii) Mentoring schemes Probationary academic staff members are required to have a mentor, and all staff are encouraged to seek mentoring from colleagues. The Universities of Dundee and St Andrews also run a cross-institutional mentoring scheme for early career researchers.

iv) Financial support for contract research staff PIs are allocated an additional £1.5k into their class grants for each grant-funded postdoctoral researcher, which can fund attendance at conferences and presentation of research at seminars and workshops.

v) Research sabbaticals PIs are encouraged to apply to the Head of School for a one-semester research sabbatical per eight semesters of regular teaching and administration.

vi) Vacation scholarships Both the School and University encourage undergraduate vacation scholars by providing funding and supporting applications for external scholarship funding.

Equal opportunities and diversity

In complying with the Equality Act (2010), staff are aware of the importance of establishing and maintaining a non-discriminatory work environment. Our commitment to equality and diversity has been demonstrated through Human Resources recruitment policies and the following initiatives.

i) The University was awarded the **HR Excellence in Research** accreditation (2012) and adheres to Principle 6 of the **Concordat to Support the Career Development of Researchers**, which includes action to communicate inclusion-related employment practice across the University.

ii) The University has shown institutional engagement with the **Athena SWAN awards** and gained membership of this scheme in 2013. The School has an **Athena SWAN Self-Assessment Team** and an **Equality and Diversity Committee**, which meets weekly and solicits action points.

iii) The University attained **Stonewall Membership** (2011) and was awarded the **LGBT Charter Mark** (2012 and 2013), following a successful programme of awareness training and engagement.

ii. Research students

Postgraduate student numbers

Our postgraduate student entry numbers have been **one third higher in the REF period** compared to the previous equivalent period, and our **entry numbers have steadily increased** throughout the REF period. Our current cohort of 67 research postgraduates is diverse, originating from 18 different countries, and were admitted with excellent first degrees and masters qualifications. Competition for funded places is very strong, and twice as many students reach our final assessment stage, with a project and proposed supervisors, than are admitted.

Studentship funding

During the REF period, the School has received PhD studentship funding from a wide range of sources, including the **EastBio BBSRC DTP**, the **Scottish Graduate School of Social Science ESRC DTC**, the University's **EPSRC DTG**, the **SINAPSE Scottish imaging network**, the **Scottish Universities Life Sciences Alliance (SULSA)** and the **Defence Science and Technology Board**. The School has obtained **CASE PhD studentship** funding, supported by the BBSRC, ESRC and several industrial partners (e.g., GlaxoSmithKlein, Merck, Unilever). PhD scholarships also have been provided by **charitable organisations**, including the **Carnegie Trust, Leverhulme Trust** and **Templeton Foundation**, and by the **EU**. Our students have received funding from **government and charitable organisations** in Brazil, France, India, Mexico and Pakistan, and our students have received **Scottish Overseas Research Studentships**. The School directly funds several PhD studentships each year from its annual budget, and bursaries are provided to MPhil students. The University has awarded 600th Anniversary PhD scholarships.

Supervision, training and student engagement

Students are allocated a **Principal Supervisor**, and some students have **Co-Supervisors**. All students have a **Second Supervisor**, who is responsible for monitoring student progress and providing academic support. Student progress is monitored via reports at the end of the 1st year and start of the 3rd year. Written annual progress reports from the student and supervisors are assessed by the **Postgraduate Committee**, which is chaired by the **Director of Postgraduates**. All information is made available for students in the School's **Postgraduate Handbook**. Postgraduates are involved in organising the annual **Psychology Forum** of talks from psychologists and neuroscientists who now work outside of academia. Students form a vital part of our academic community, and postgraduate representatives sit on the **School Council**, **Postgraduate Committee**, **Research Committee** and **Staff-Student Consultative Committee**.

i) Training and support within the School

Our students are provided with a comprehensive **Postgraduate Training Programme**, which consists of subject-specific, professional skills courses and other training events. Each year, postgraduates give a 30-minute **Psycholoquia talk** and produce a poster for the **Postgraduate Research Session** in the School. Specific training programmes for individual students are agreed annually with supervisors, and students keep a record of all their training activities in a **Postgraduate Logbook**. The School's **Postgraduate Statistics Advisor** is available and holds drop-in sessions to support statistical training. All postgraduate research students are provided with a desk and computer, and supervisors receive **£1.5k per student per annum** to support basic research expenses, including UK conference attendance. The School's **Research Student Travel Fund** provides support (up to £1k over 3 years) for attendance at international conferences. Students are encouraged to attend the **Friday School Seminars** and to attend meals with the speakers, with student costs supplemented from the School budget. Postgraduates also participate in the student-run **Psychological Society** and **Neuroscience Society**, which organise invited talks and weekly social events, as well as the annual **School Winter Party** and **Summer Ball**.

ii) Training and support within the University

The University's research postgraduate school, **St Leonard's College**, has responsibility for ensuring an appropriate research training environment and organising networking events. The University provides a Times Higher-commended **GRADSkills** programme, which includes training sessions on topics such as managing your PhD, thesis writing and interview skills. The University also runs **postgraduate induction events**, which provide opportunities to meet students from other Schools. The University also provides a **Student Support Service** and **Mathematics Support Centre**, and the **Careers Centre** runs careers events and an alumni career network.

iii) Training and support within Scotland and beyond

The School is part of a network that co-ordinates the **Scottish Universities Psychology Postgraduate Research Training (SUPPORT)** programme. Each of the 8 participating universities provides a day of workshops for postgraduate students that are designed to introduce specific research techniques. Our PhD students regularly present at the annual conferences, e.g., **Scottish Neuroscience Group** conference, and regularly receive external funding to present at international conferences, supplemented by School funds.

d. Income, infrastructure and facilities

Major research income

During the REF period, the School has been awarded **over £12M in competitive grant funding** from a broad range of sources. This amount includes a £2.6M grant from the **John Templeton Foundation** (Whiten, 2013-2016), a £1.3M **ERC New Investigator** grant (Zuberbühler, 2012), over £4M from UK research councils, over £2M from government and charitable organisations, and £1M from industrial partners. We have received impact-related research funding from the **Technology**

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Strategy Board, the NHS and the University's EPSRC pathways to impact funding award. Our researchers have been awarded research fellowships both in the UK (e.g., *British Academy Wolfson Research Professorship, Royal Society Industry Fellowship*) and abroad (e.g., *Fellowship of the Centre for Advanced Studies (Wissenschaftskolleg) Berlin*). In addition, the School has been involved in successful bids for a £1.5M *Wellcome Trust Institutional Strategic Support Fund* and a £445k *EPSRC equipment grant*.

Research infrastructure and facilities

During the REF period, substantial investment has been made in our research infrastructure, and we have acquired an additional 2,000m² of space in adjacent buildings to the main building in St Mary's Quad. The *University Library* has also undergone substantial renovation at a cost of over £14M, including creation of the *Martyrs Kirk Reading Room* for research staff and students.

Experimental neuroscience facilities

The University possesses a secure animal facility, newly renovated to a high standard at a cost of over £1.5M during the REF period, which supports research on rodents, birds, amphibians, and fish. The facility comprises animal holding rooms, a surgical suite, and behavioural testing rooms, and is staffed by a dedicated manager and 6 animal technicians. The School also has multiple sets of electrophysiology stations, wet-lab and histology facilities, and a microscopy suite, which houses advanced multi-photon and fluorescent microscopes. During the REF period, the School has upgraded the laboratory facilities and invested £200k in communal neuroscience equipment.

Human behavioural and imaging facilities

Our researchers conduct fMRI and simultaneous EEG-fMRI experiments using the facilities at Ninewells Hospital, Dundee, through the cross-university *Scottish Imaging Network: A Platform for Scientific Excellence (SINAPSE)* pooling initiative. The School has EEG laboratories and has purchased a £30k TMS system. Specialised equipment for vision research includes stereoscopic displays, eye-movement trackers, limb-trackers, a 3-D scanner, spectrophotometers and thermal imagers, and computing facilities with software for studying face perception. We have individual and group testing areas, including computer clusters and a social immersion laboratory, in which participants are surrounded by audio and video stimuli. The human experimental laboratories have undergone expansion and major refurbishment at a total cost of over £300k during the REF period.

'Living Links to Human Evolution Research Centre', zoo populations and field sites

Opened in 2008, the *Living Links to Human Evolution Research Centre* is a University of St Andrews primate research centre, housed in Edinburgh Zoo. *Living Links* (directed by Whiten and Seed) was created through a £1.6M research grant from the Scottish Funding Council and provides excellent facilities for studying primate behaviour and cognition. We also study primate behaviour at the Keeling Center, Texas; Max Planck Institute for Evolutionary Anthropology, Leipzig; and at several field sites in Africa and South America, e.g., at the Budongo Conservation Field Station in Uganda, where Zuberbühler is scientific director. Our researchers study elephant cognition in Africa and bird cognition at Edinburgh Zoo and Parrot Zoo, Skegness.

Infrastructure policy and practice

The School's ***Infrastructure Committee***, chaired by the ***Director of Infrastructure***, oversees the maintenance, development and allocation of the research and teaching facilities.

i) Room booking system The majority of the research space is available for any researcher to use, and facilities are shared wherever possible. The on-line ***Room Booking System*** allows PIs, research staff and postgraduate students to book research spaces and access shared facilities.

ii) Ethics committees The School's ***Ethics Committee*** approves ethical applications for human experimental and non-licensed animal research, overseen and supported by the ***University Teaching and Research Ethics Committee*** and the ***Animal Welfare and Ethics Committee***.

iii) School support staff Our research is facilitated by a team of ***9 members of technical staff***,

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i.e., a School Manager, who is responsible for health and safety compliance, 1 School Superintendent, 3 mechatronics/mechanical engineering technicians, 2 ITC technicians, and 2 software/website developers. The School is also supported by **6 members of secretarial staff**.

e. Collaboration and contribution to the discipline or research base**Research centre and institutes**

- The **Centre for Social Learning and Cognitive Evolution** brings together 9 PIs from the School and a further 8 from the School of Biology, who share common interests in the evolution of cognition and culture. During the REF period, the Centre has won 3 ERC Advanced and Starter grants worth £5.5m, plus substantial funding from other sources.
- The **Institute of Behavioural and Neural Sciences** brings together 50 PIs in the Schools of Psychology & Neuroscience, Biology, Medicine, Chemistry in St Andrews, who share an interest in the neural underpinning of behaviour. IBANS provides undergraduate and postgraduate research bursaries and co-ordinates events that have led to joint grants and PhD supervision.
- The **Scottish Primate Research Group** consists of 22 Principal Investigators (10 from St Andrews) from across 6 Scottish Universities. SPRG provides a forum for primate researchers and has led to joint research ventures, such as grants, publications and PhD supervision.
- The **Scottish Institute for Policing Research** is a strategic collaboration between 12 Scottish universities and the Association of Chief Police Officers in Scotland that promotes inter-disciplinary policing research and consists of 26 senior academics and police officers.

Collaborative research grants and PhD studentships

i) Collaborative research grants We conduct **funded research collaborations in the UK**, for example, University of Aberdeen (Motor Neurone Disease Scotland, Miles), University of Bradford (BBSRC, Harris), University of Bristol (BBSRC, Li, Harris), University of Edinburgh (Motor Neurone Disease Association, Miles); **and abroad**, for example, Harvard University (Templeton, Whiten), UC Berkeley (Royal Society, Seed), Allahabad University and IIT Delhi (ESRC, Reicher), Macquarie University (Australian Research Council, Byrne, Reicher), University of Queensland (ARC, Whiten), University of Bordeaux (CNRS-funded, Sillar), University of Zurich (Swiss National Science Foundation, Whiten), University of Lausanne (Swiss NSF, Reicher).

ii) Interdisciplinary research We conduct funded research with academics across a variety of disciplines, including *optometrists and sports scientists* (BBSRC, Harris), *child nutritionists* (MRC, Harris), *medics* (NC3Rs, Pfizer Neusentis and Grünenthal, Miles), *medical scientists* (Alzheimer's Research UK, Ainge), *biologists* (Templeton Foundation, G Brown, Cross, Sheikh, Whiten; BBSRC, Harris, Spencer), and *film studies* (Australian Research Council, Reicher).

iii) Cross-institution PhD co-tutelage We have co-supervised students at 12 institutions: Aberdeen (Miles/O'Connor), Aveiro (Perrett), Dundee (V Brown), Edinburgh (Miles), Göttingen (Reicher), Neuchatel (Byrne/Zuberbühler), Rennes (Zuberbühler), St Etienne (Zuberbühler), Strathclyde (Ainge), Trondheim (Reicher), UCL (Zuberbühler), Ulm (Sprenghelmeyer).

iv) Visiting scholars Our researchers have held **4 externally funded visiting scholarships** at Berlin, Germany (Zuberbühler), Bochum University, Germany (Seed), Macquarie University, Australia (O'Connor), and University of Ulm, Germany (Sprenghelmeyer). The School has hosted **34 visiting scholars** from Australia, Austria, China, Denmark, France, Germany, Italy, Japan, Netherlands, Norway, Poland, Portugal, South Africa, Switzerland, UK and USA.

Contributions to the discipline

During the REF period, our researchers have been awarded **22 prizes/fellowships**, have held **positions in 10 grant funding bodies**, contributed to **39 academic societies and editorial boards**, given **23 plenary talks** and organised **12 international conferences**, including the *350th Anniversary Royal Society/British Academy Joint Discussion Meeting and Science Exhibition*.

i) Prizes *Royal Society of Edinburgh Sir James Black Medal* (Whiten, 2013), *Primate Society of*

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Great Britain's Osman Hill Medal (Whiten, 2010), *Outstanding Doctoral Research Contributions to Psychology Award*, *British Psychological Society* (Tausch, 2009), *Best Student Paper Award*, *Society of Personality and Social Psychology* (Sheikh, 2010), *International Leadership Association book prize* (Reicher, 2011), *BPS Excellence in Teaching of Psychology Award* (Reicher, 2009).

ii) Fellowships 16 fellowships: *Academician of Social Sciences* (Reicher, 2011); *Alzheimer's Society fellowship* (Doherty, 2008-13); *British Academy Wolfson Research Professorship* (Perrett, 2009-12); *European Huntington's Disease Network/University of Ulm Research Fellowship* (Sprenghelmeyer, 2011-13); *Fellow of Association for Psychological Science* (Carpenter, 2012); *Fellow of British Psychological Society* (MacLeod, 2011); *Fellow of Cognitive Science Society* (Whiten 2013); *Fellowship of Centre for Advanced Studies (Wissenschaftskolleg) Berlin* (Zuberbühler, 2009); *Fellowship of Royal Society of Edinburgh* (V Brown, 2012; Zuberbühler, 2011); *Fellowship of Royal Society of Edinburgh Young Academy* (Tausch, 2011); *Irvine Memorial Medal* (Call, 2013); *Leverhulme Early Career Fellowship* (Blackwood, 2012); *Leverhulme Trust Research Fellowship* (Harris, 2011-13); *Royal Society Industry Fellowship renewal* (V Brown, 2006-12); *Sheth Distinguished International Alumni Award, Emory University* (Call, 2011).

iii) Positions on grant awarding bodies 10 bodies: *Chair, British Academy Awards Committee* (Whiten), *BBSRC Committee A Panel member* (Harris), *ESRC Pool of Experts* (Harris, Jentzsch, Sprenghelmeyer, Tausch), *EPSRC College* (Harris), *Fyssen Foundation* (Call), *MRC Awards Panel* (V Brown), *MRC Pool of Experts* (Sprenghelmeyer), *NC3Rs Awards Panel* (V Brown), *Royal Society Newton International Fellowships Awards Panel* (Li), *Royal Society of Edinburgh Fellowships Awards Panel* (Perrett, Reicher, Zuberbühler), *Vision Science Society Awards Panel* (Harris).

iv) Positions in learned societies 9 societies: *Secretary, European Brain and Behaviour Society* (V Brown, 2008-11), *Vice-President, European Human Behaviour and Evolution Association* (G Brown, 2012-15), *Committee Member, European Society of Psychology and Philosophy* (Seed, 2013), *Council Members, International Society for Political Psychology* (Blackwood, 2011-14, Reicher, 2010-11); *Treasurer, Primate Society of Great Britain* (G Brown, 2008-12).

v) Journal editorial boards a) **Editor-in-Chief:** *J Comp Psychol* (Call), *Neurosci Biobehav Rev* (V Brown); b) **Associate editors/advisory board members:** 28 journals, including *Biol Lett* (Byrne, Call, Spencer), *Brit J Soc Psychol* (Reicher), *Child Devel Persp* (Carpenter), *Cognition* (Carpenter), *Curr Biol* (Byrne), *Dev Sci* (Gomez), *Eur J Soc Psychol* (Tausch), *Horm Behav* (G Brown), *J Comp Physiol B* (Sillar), *J Comp Psychol* (Whiten), *J Vision* (Harris), *Methis* (Gomez), *Neurosci Biobehav Rev* (Bowman), *Phil Trans R Soc B* (Whiten), *Primates* (Call), *Scientific American Mind* (Reicher), *Soc Cog Affect Neuro* (Perrett), *Vision Res* (Harris), *Quart J Exp Psychol* (Jentzsch).

vi) Plenaries 23 plenaries including: *American Psychological Association Convention* (Whiten, 2013); *Brazilian Society of Ethology* (Zuberbühler 2010); *European Human Behaviour and Evolution Association* (Call, 2010; Whiten, 2012); *European Federation of Primatology* (Zuberbühler, 2011); *German Society for Individual Psychology* (Carpenter, 2012), *International Anthropological Congress* (Perrett, 2009); *International Ethological Conference* (Call, 2009); *International Primatological Society* (Whiten, 2008); *International Society for the Study of Behavioural Development* (Carpenter, 2013), *International Society for Human Ethology* (Whiten, 2012); *Society for the Psychological Study of Social Issues* (Reicher, 2012).

vii) Conference organisation 12 international conferences, including: *Royal Society/British Academy joint 350th Anniversary Discussion Meeting plus Kavli Centre satellite meeting* (Whiten, 2010, London); *Collective Action and Social Change conference* (Tausch, 2009, Groningen); *European Human Behaviour and Evolution Association conference* (G Brown, 2009, St Andrews); *European Association of Social Psychology* (Reicher, 2013, Lausanne); *International Society of Political Psychology meeting* (Blackwood, Reicher, 2010, San Francisco); *Royal Society International Scientific Seminar meeting* (V Brown, 2011, London).