

Institution: University of Exeter

Unit of Assessment 4: Psychology, Psychiatry and Neuroscience

a. Context. Exeter Psychology is organised into four productive research groups, each engaging in work to translate basic science discoveries and expertise into clinical practice, training, public policy, well-being, public understanding and/or economic and environmental impacts.

The **Animal Behaviour Group** has particular strengths in animal cognition and social behaviour. The group's Centre for Research in Animal Behaviour (CRAB) works with industry partners, NGOs and government to translate the scientific outputs of its research into improving the productivity, welfare, and conservation of wild, captive and farm animal populations.

The **Clinical Group's** Mood Disorders Centre (MDC), as described in Case Study 1 – "CS1", identified clinical impact as a key objective at its foundation (2004). It has already had a worldwide impact on treatment of depression. Its Clinical Education Development and Research (CEDAR) arm also influences UK clinical practice by training NHS clinical psychologists, IAPT and other therapists and healthcare leaders. The group's work also includes research on understanding and remediation of PTSD, overeating, substance abuse, and addiction.

The **Cognition Group's** Centre for Clinical Neuropsychology Research (CCNR) links neuroscience and practice, and facilitates collaboration with neurologists and medical epidemiologists, to improve outcomes for survivors of neurological injury or disease. An example of its impact on national policy is described in CS2 on traumatic brain injury in young offenders. A new Centre for Cognitive Control and Associative Learning (CCAL), including members of the Clinical group, focuses on the psychology and neuroscience of the interaction between learning and control, and translation into understanding and remediation of addictive/impulsive disorders.

The **Social, Environmental and Organisational Research Group (SEORG)**, focuses on social identity and group dynamics (communication, leadership, cooperation, discrimination) and how they affect individual wellbeing, motivation, and performance. CS3 describes a project with impact on gender equality, CS4 a study that has influenced education and public understanding. Other projects with impact on well-being, quality of life and productivity are described below.

Also returned in UoA4, from the University of Exeter Medical School (UEMS), are health psychologist Abraham, recently appointed to lead a Psychology Applied to Health group (that collaborates with SEORG), and neurologist Zeman, a member of the CCNR.

Impacts of our research other than those covered in the Case Studies include:

Impacts on food security and animal welfare: Croft's research on animal social networks has led to a growing collaboration with the dairy industry (DairyCo; Milk Link) with the aim of improving productivity and welfare through management of social relationships in dairy herds, to a BBSRC-funded project with Omnisense to develop an automated early warning system for dairy cow health, and to contract research for DEFRA on the consequences of herd size for welfare.

Madden's work with the Game and Wildlife Conservation Trust (GWCT) addresses productivity, welfare, and environmental improvement in pheasant-rearing. Hempel de Ibarra, expert on bee behaviour, contributes to work funded by a food retailer to provide a scientifically sound basis for the environmental risk assessment of neo-nicotinoid insecticides that affect pollinators such as bees, and threaten crop productivity. Using tasks originally developed for animal cognitive testing, Lea and Leaver have worked with Paignton Zoo (WWCT), the RSPCA and the Donkey Sanctuary on interventions to improve the welfare of captive animals.

Impacts on conservation and biodiversity: Through its research on animal populations of conservation concern, CRAB regularly makes recommendations to national and international research and conservation organizations including GWCT, Songbird Survival, Paignton Zoo, Natural England (all UK), Queensland Parks and Wildlife Service (Australia), Mankwe Game Reserve and African Elephant Research Unit (South Africa), Phana Macaque Project (Thailand), and the Center for Whale Research and the National Wildlife Research Center (USA). In collaboration with South West Water, CRAB is exploring how environmental management practices alter cattle movement patterns and foraging behaviour, with the aim of improving the management of sites of special scientific interest.

Impacts on productivity and quality of life in the workplace: In an ESRC CASE PhD project on "Identity and Space Management" co-funded by furniture company Haworth and plant supplier Ambius (then Rentokil), Knight, supervised by A. Haslam, showed that empowering workers to

Impact template (REF3a)

develop their own workspace produced dramatic gains in productivity and well-being over the conventional “lean” approach (high surveillance, low control, open plan). The research has been widely publicised in the industry, developed into a module for the British Institute of Architects CPD programme, and translated by Knight (now directing a space management consultancy) into tailored interventions for many organisations. SEORG has had contracts from the MoD to instruct senior members of the Forces (along with NHS and private sector employees) on organisational psychology and behaviour. These interactions led to research projects with the MoD on the role of identity processes in stress and recovery and on work-life balance among personnel at sea.

Impacts on well-being and social care. In research funded by an ESRC Large Grant on social identity processes, neuropsychologist C. Haslam (Associate Professor until 2012) and members of SEORG, working in partnership with the Somerset Care Group, showed that sharing life histories in groups of care home residents improved cognitive function, life satisfaction, and mood; changes in care practice ensued. This partnership with Somerset Care was honoured for “Outstanding Dementia Research” at the first National Dementia Care Awards in 2010. The research has now been extended to other partners (Cornwall Care; Research Institute for the Aging, Canada) and is being taken forward by Morton and Barreto in the international AGES 2.0 project on effects of social networking on social inclusion and cognitive function, funded by an EC PROGRESS grant.

Impacts for victims of neurotrauma. CCNR works on epidemiology, diagnosis and rehabilitation of brain injury and disease. In addition to discovering a very high incidence of brain injury in young offenders, as described in CS2, Williams has also worked on incidence of closed head injury and its consequences in jockeys (with funding from the Jockey Club), rugby players, and patients in A&E; he has consulted on management of concussion for the English Rugby Union. Contributions to diagnostic tools include continuing work since 1993 on translation into other languages of Kay’s 1992 PALPA (Psycholinguistic Assessments of Language Processing in Aphasia) test battery, widely used by clinicians and language therapists, and Milton and Zeman’s characterisation of the memory deficits in transient epileptic amnesia. Contributions to rehabilitation techniques include C.Haslam’s research on errorless learning. We also provide expert advice to brain injury charities: aphasiologist Code (honorary fellow, based in Psychology) is National Advisor on Aphasia to the charity ‘Speakability’ and Patron of ‘Aphasia Now’, and Williams has been a Trustee of Headway.

Impacts on public policy. To add to the influence on NHS and government policy outlined in CS1 and CS2, Abraham was scientific advisor to a House of Lords Science and Technology Committee enquiry into Behaviour Change, and Levine was a member of the project Lead Expert Group (LEG) for the 2013 Government Office for Science Foresight report on Future Identities.

Impacts in applied human factors: Lavric has engaged in research with FlyBe (funded by an EPSRC “Bridging the Gaps” grant) on “attentional inertia” in aircraft inspection, and with Web company Optix on attentional behaviour. Wills (left 2012) had two contracts with QinetiQ.

b. Approach to impact. We support and prioritise impact as follows:

Appointments: Since 2008 we have increased our capacity in research areas with the potential to address important needs of society. We have made appointments to extend our expertise in depression (Dunn, Moberly, Psychiogou), strengthened SEORG with appointments to address social inclusion (Barreto, Levine, Livingstone, Koschate-Reis) and a post in climate change (Kurz). A set of recent appointments across the Cognition and Clinical groups has created a new focus on translation from research on basic mechanisms to remediation of addictive and impulsive disorders: Verbruggen (psychology and neuroscience of inhibition), Lawrence (regulation of appetitive behaviours), Hogarth (application of learning theory to substance-abuse behaviour), Morgan (neuropharmacology of substance abuse), Dodds (neuroscience of control); this new focus is drawing in existing basic-science researchers in associative learning and control (Lavric, McLaren) to collaborate on applications.

Development of strategic partnerships with end users: Strong links with the end user community are explicitly built into the MDC (see CS1) and CEDAR’s contracts with the NHS clinical commissioners to deliver IAPT and DClinPsych professional training. The MDC also has a Lived Experience Group of individuals with experience of depression and their carers that informs its work. SEORG has important links with the MoD and Dstl. Other examples of end user partnerships are described above (social care organisations, dairy industry) and in the other Case Studies.

Infrastructure, support, and training to facilitate impact: Research and Knowledge Transfer staff facilitate and support linkage with end-users of research and exploitation of research.

Impact template (REF3a)

Psychology is supported by a liaison officer focused on developing strategic partnerships in the clinical realm, and a College business liaison officer with a brief to develop other partnerships. University seed-corn funding schemes (e.g. 'Link funding', business vouchers) help resource early-stage relationships (e.g. work with a food retailer on bees, with FlyBe on flight check procedures, and with the dairy industry). PhD studentships jointly funded by a sponsor and the university play an important role in generating impact. Psychology helps to host businesses at the University's Business Leaders Forum. Identifying impact at an early stage is facilitated by peer review of grant applications, workshops on impact, research group seminars in which partnerships are discussed, and cross-group "speed updating" lunch sessions on topics such as Behaviour Change.

Public dissemination of research: All research groups play an active and increasing role in presenting research to the outside world through the media, supported by the university's Press Office (see REF 5 for statistics). Lawrence has a £3K Catalyst public engagement seed fund grant to support the development of a new rapid-response service to link politicians and scientists.

c. Strategy and plans. During 2008-2013, we have consolidated a culture that recognises the importance of impact. In concert with the University's Science and Social Science strategies, Psychology explicitly prioritises the development of research bridging our research portfolios towards key applied themes: (i) Mental and Physical Health, and Well-being, (ii) Environment and Sustainability, (iii) Diversity and Social Inclusion, (iv) Animal Health and Welfare, and (v) Behaviour Change. This strategy is supported in several ways: (a) Outreach time is included in staff workload models. (b) We ask academics to identify impacts during their annual PDR meetings. (c) Evidence of effective knowledge transfer and extra-academic impact is an important recruitment criterion. (d) There is 50/50 matched funding for PhDs studentships sponsored by industry or charity (e.g. DairyCo, GWCT, and Songbird Survival in CRAB). (e) College business managers and Link funding help staff develop relationships with external businesses and organisations. (f) The University's internationalisation strategy also generates collaborative opportunities for impact. For example, links developed with Chinese institutions are creating the potential for knowledge transfer and partnership in areas of excellence including brain injury and cognitive behavioural therapy. (g) Other University-wide initiatives encourage and reward impact, including a biennial competition for impact awards (Psychology has 4 entries this year).

To maximise the impact of our research, we will maintain and develop strategic relationships through collaboration and consultancy with end users such as the NHS clinical commissioners, international health providers, major employers, public bodies, charities and Government. We will seek to extend our research further into key policy areas – for example through clinical trials that influence NICE recommendations and commissioning of services, and research into effective behaviour change in relation to health and environment. Psychology's research Centres and the UEMS Health Psychology group are between 2 and 9 years old, and their members at career stages that afford considerable potential for future impact. For example CCAL's research is at a very early stage in translation towards applications, and its addiction and impulsive disorder specialists are new appointments. We will prioritise these translations over the next 5 years.

d. Relationship to case studies. Our four Case Studies and other examples reviewed illustrate the range of our impact across a spectrum of user communities: national services for mood disorders (CS1) and other clinical and health-care services; parliament, the justice system, and the secure estate (CS2); business and organisations looking to improve gender equality (CS3), diversity, productivity, well-being, and safety in the workplace; education and public understanding (CS4); agriculture, zoos, animal welfare, and conservation bodies. These examples illustrate how our research (i) involves strategic relationships with non-academic partners (e.g. NHS, elements of the justice system, charities, Met Office, IBM, CIPD, Armed Forces), (ii) reflects key international, government and funder priorities; (iii) builds on robust experimental and applied research, (iv) is directly informed by end-users (e.g., businesses, patients, sports bodies), and (v) is targeted to inform policy and decision-making amongst key stakeholders (e.g., Parliament, NICE, IAPT, Youth Justice board, schools and exam boards, companies). Our case studies were selected as examples relatively far along the impact development pathway. Given the stage of development of our research groups, and emerging translational themes spanning across them and the UEMS Psychology Applied to Health group, notably behaviour change, we anticipate that their research will provide substantial Case Studies for future REF cycles.