

<b>Institution:</b> Swansea University
<b>Unit of Assessment:</b> (4) Psychology, Psychiatry and Neuroscience
<b>1. Unit context and structure, research and impact strategy</b>

## 1.1 Overview

Research within the unit of assessment (UoA) is conducted primarily by staff from the Department of Psychology in the College of Human and Health Sciences (soon to be Faculty of Health and Life Sciences; n=27) based on the Singleton campus of Swansea University. Two staff from the Centre for Innovative Ageing and the School of Management (Faculty of Humanities and Social Sciences), respectively, complete the Category A submitted staff profile. The distribution of key unit staff across faculties has helped facilitate inter-disciplinary working as evidenced in submitted outputs, pipelines for research innovation and enterprise, and in our growing research income and range of impact case studies.

In REF2014, the unit was one of only four UK departments out of 82 to attain a 100% rating at 4\* (world-leading) for research impact (making it joint first in the UK league tables). Its research was ranked 27<sup>th</sup> (by GPA), with 44% of research activity at 4\* and 31% at 3\*, respectively, and a GPA average of 3.18 and research power score of 4. Almost 90% of its research environment was rated 4 or 3\*. Since then, the UoA has further enhanced its reputation as a world-leading research institution in cognitive neuroscience and clinical, health and forensic psychology. We achieved this by targeted new staff appointments (11 since 2014), increased research income, University investment in infrastructure and research support systems (e.g., several new labs, state-of-the-art equipment, and growth in postgraduate student numbers), and the full implementation of our strategic research aims.

Our research adopts a translational perspective to better understand problems of social importance and inform policy-based debate and legislative change. Our strategy is to first gain an empirical handle on complex psychological processes before extrapolation to socially significant challenges. This translational-to-applied research emphasis ensures that the basic understanding of human psychological and neuro-behavioural processes creates pathways that directly inform the development and application of assessment and intervention techniques for use with a wide range of populations.

Since REF2014, our research themes and groupings have been revised to reflect staffing changes and new facilities coming online. Research is now arranged according to **two general themes**:

- **Clinical, Health, and Forensic Psychology**
- **Cognitive Neuroscience**

These themes encompass several **distinct and overlapping research groups** supported by external funding, world-class laboratory facilities and equipment, international patient networks, and specialist technical support.

Research groupings and labs within **Clinical, Health, and Forensic Psychology** consist of staff with interests in topics such as obesity, nutrition, and appetite (e.g., the Swansea Nutrition, Appetite and Cognition group), gambling, mental health, and behavioural addiction (e.g., the Experimental

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Psychopathology Lab), sleep (e.g., Swansea Sleep Lab), and forensic psychology (e.g., offender management and suicide prevention).

Research groupings and labs within **Cognitive Neuroscience** consist of staff with interests in areas such as brain mechanisms in health and disease (e.g., Psychology Dementia Research Group, Face Research Swansea), neuroimaging, brain stimulation (e.g., Brain Plasticity Lab), and cognition and perception (e.g., visual perception, memory, and language).

All research groupings are led by senior and/or early-career researchers in a collaborative leadership structure, and members also include postgraduate research students (PhD and MSc), research assistants and postdoctoral research officers, supplemented by our in-house technical support. Groupings tend to be relatively informal, with many staff members of several different groups. Overlapping these groupings and themes, the adjacent **Swansea University Medical School Institute of Life Sciences Imaging Centre** houses our research MRI scanner, patient areas, and a behavioural testing suite.

### 1.2 Strategic aims and objectives

The **unit met its objectives** described in REF2014 to:

1. Double research income (from a broader range of sources).
2. Increase by 25% its postgraduate research student numbers.
3. Establish new research networks and collaborations.
4. Host major international conferences.
5. Increase interactions with end users.

These were achieved by an ongoing, University-led programme of investment to enhance and maintain our **world-class reputation for enabling high quality research with applied impact**:

1. **Our research income across the census period has increased to over £2M.**
2. **Postgraduate research student numbers have increased** during the census period. The number of PhDs awarded has increased by 37.5% from REF2014 and has continued to grow during the census period (76% increase comparing 2013/14 data with 2019/20). This growth is partly driven by increased studentship funding from external partners and agencies such as the Economic and Social Research Council (ESRC) Wales Doctoral Training Partnership (DTP).
3. **New research links and collaborations continue to increase** (as evidenced by co-authored outputs and co-creation of projects and grants). Our collaborative research is supported by external organisations and the public who work with us to inform, enhance, and adapt our research practices to address global challenges. New campus-based facilities such as the Health and Wellbeing Academy and the Institute for Life Sciences Imaging Centre support and enable world-leading research with direct impact.
4. **Unit staff have hosted and organised several high-profile major international conferences**, such as the 10<sup>th</sup> European Meeting on Human Fear Conditioning in 2018 and the 2019 British Feeding and Drinking Group meeting. Conferences planned for 2020 but which were postponed due to the COVID-19 pandemic, such the Experimental Psychology Society Summer Conference and the 2<sup>nd</sup> Current Advances in Gambling Research Conference, have been rescheduled.

5. **Unit research benefits from the direct involvement of research end-users**, such as patients and those with lived experience, during project inception, design, and dissemination phases. For instance, the Support and Delivery Centre Communication, Engagement and Involvement team from Health and Care Research Wales advise unit staff, including two Research Directors from the Centre for Innovative Ageing and the Gambling Research, Education and Treatment Network Wales, respectively, on its public involvement plans. These structures ensure fair and transparent processes for involving the public that reflect equality and diversity as well as quantifying the extent of the impact of public involvement across Wales.

Our overall strategic research aim is to consolidate further our position as a leading UoA in the UK for internationally excellent translational psychological research with broad societal impact. Overseen by a senior academic as the College Director of Research, and developed in consultation with the research themes, **our research and impact strategy and objectives** over the next five years are based on the following key principles:

1. **Improve and maintain research quality and capacity in areas of strength.** We will continue to incentivise research excellence and achieve critical mass to expand and develop existing, high-profile research groupings in cognitive neuroscience and clinical, health, and forensic psychology. Guided by our REF Strategy, we will assess this objective through an increased proportion of world-leading research outputs, further staff appointments on enhanced-research academic career pathways, and continued capacity building and infrastructure development.
2. **Accelerate the impact of our inter-disciplinary applications of psychological research to better inform treatment of health and disease.** We will prioritise and evidence a growing portfolio of high-quality research impact case studies closely aligned to contemporary policy, legislative and evidence-based treatment developments. We will assess this objective through a minimum 25% of staff having a strand of impact-related activity by the next REF cycle.
3. **Further develop our levels of strategic and responsive external investment.** We will assess this objective through research income awarded from a diverse range of funders, with increased funding levels from non-traditional (e.g., third sector) and international sources, and by consolidating staff levels in our areas of expertise. Doing so will ensure we are well placed to maximally respond to global societal research challenges.
4. **Enhance our international profile for both research and impact.** We will achieve high discipline rankings in reputable league tables (e.g., Times Higher Education Supplement, World and QS rankings) and maintain our global reputation with highly cited outputs. We will evaluate this objective through increased SciVal metrics of our work, achieving UK Top 20 performance for research impact in REF2021, and an increased number of international research collaborations with colleagues at prestigious institutions.

### 1.3 World-class research with global reach

These strategic objectives are supported by a College and departmental Research Strategy, staff appointments on enhanced research career pathways (Section 2), research incentivisation systems, internal roles and responsibilities and institutional systems and support for enabling impact and maintaining the global reach of our research.

Our **international focus** is evident in co-authored outputs and co-production of projects and grants. Our international collaborative **research outputs have a citation impact 478% higher than the**

**world average and a Field-Weighted Citation Impact score of 5.86** (SciVal). Projects illustrative of this global reach include the epidemiology of health and wellbeing in Brazil, work scheduling effects on anti-depressant use in Sweden, the neuroscience of human memory, and of gambling disorder, conducted with colleagues in the United States, and research on aging and large-scale functional networks with researchers in Australia.

Manuscripts and datasets are regularly published, open-access, in top-tier scientific journals (e.g., *British Medical Journal*; *American Journal of Psychiatry*; *Cortex*; *Neuropsychologia*; *Journal of Experimental Psychology: General*; *Journal of Experimental Psychology*; *Learning Memory and Cognition*; *Scientific Reports*; *Neuroimage*). World-leading research is evident in the outputs of the 28 (26.5 FTE) Category A submitted staff (an increase of 11.7 in FTE since REF2014). Our total scholarly outputs have increased 18% over the period (529 in total), generated 12,887 citations with 24.4 citations per publication, and have **a Field-Weighted Citation Impact of 3.22**. Almost 18% of our outputs are in the top 10% most cited publications worldwide (SciVal).

Our staff have access to **a range of specialist laboratories and fifteen, centrally bookable general-purpose testing laboratories** maintained by dedicated research technicians and lab managers. Specialist facilities include four labs for measuring psychophysiology, three electrophysiology labs, brain stimulation labs, a sleep lab, a baby-friendly play lab, two eye-tracker labs, as well as specialist space for research with elderly populations and for advanced neuroimaging techniques (e.g., functional magnetic resonance imaging, fMRI; near-infrared spectroscopy, NIRS) and biological (“wet lab”) storage and processing facilities.

The **structure of the unit supports our stated aim to increase the pace of enabling research with impact** to treat common physical and mental health conditions. It does this through interfaces and physical links with adjacent campus research facilities and centres such as the award-winning Health and Wellbeing Academy, the Institute for Life Sciences I and II, and Data Science buildings, respectively.

For instance, the **Health and Wellbeing Academy** is a collaborative project between the College of Human and Health Sciences at Swansea University and ARCH (A Regional Collaboration for Health). The Health and Wellbeing Academy aims to improve the health and wellbeing of people in south west Wales by bringing together innovation, education, enterprise, and world class research. It is located next to the unit on Singleton Campus, with excellent public transport and free parking available directly opposite the main entrance. Many of its services and support groups are free of charge to patients and their carers. Our staff have provided strategic input into the direction of the Academy, having provided its founding director of research, while other staff retain senior management and College-wide leadership roles.

The unit’s physical infrastructure and the proximity of its associated research centres with local NHS-based services provides a convenient location for a range of clinical and research facilities. For instance, in the space of a few minutes, service users may undertake a clinical assessment in Singleton Hospital, walk to the Academy for group therapy or further tests, before then participating in a world leading research study in the Department of Psychology. These physical configurations support the sustainability and vitality of the unit by affording opportunities to directly engage with end-users and provide a platform to disseminate findings via local and ultimately global networks.

Our structure and physical location also actively facilitate **interdisciplinary research** by the unit. As our REF2014 impact track record suggests, interdisciplinary research is a proven, recognised area

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of strength. Indeed, we strategically set out our research themes to be, intentionally and explicitly, inter- and multi-disciplinary.

**Cognitive neuroscience staff**, for instance, collaborate with:

- NHS staff (e.g., dementia carers, clinical psychologists, audiologists, NHS Veterans Wales).
- rehabilitation services, brain injury clinics, and third sector treatment providers and charities (e.g., dementia support agencies).
- policymakers, and other stakeholders (e.g., those with anxiety disorders, face processing deficits, etc.).

**Clinical, health, and forensic staff**, for instance, collaborate with:

- healthcare professionals (e.g., occupational therapists, nurses, mental health nurses).
- criminal justice employees (e.g., prison governors and officers, probation officers).
- consultant neurologists, shift supervisors and managers.
- food and drinks industry R&D managers.
- third sector treatment providers and charities (e.g., veterans' support agencies), policymakers, and other stakeholders (e.g., those with lived experience of gambling addiction, obesity, acquired brain injury, etc.).

These links are facilitated by established stakeholder links, on-campus and locally accessible networks and infrastructure, and strategic research support services. A more informal system of mentorship and support ensures we are well placed to take advantage of research opportunities and to tackle a range of global challenges.

## 1.4 Impact strategy

Our strategic intent is to continue to build on the unit's 100% record at 4\* (world leading) research impact. This is guided by the **Human and Health Sciences Research Strategy**. Specifically, the UoA seeks to embed the translation and impact of research early in the research cycle for all research staff and grows and develops the number and range of non-academic networks and contacts with user and beneficiary communities. We currently use seed-corn funding to identify potential impact case studies, and we encourage all staff to evidence the potential impact of their research from inception through to data collection stages. The translation and impact of research will continue to be supported by a **dedicated Impact Support Officer** to protect and exploit commercialization opportunities, administer specialist funding to foster and disseminate impact which reflects contemporary policy and legislative developments, and will help to increase knowledge and technology transfer opportunities for staff.

Training in maximising the impact of unit research is provided by Library and Information Services. Staff learn how to be strategic about impact, making sure to plan stakeholder engagement and other pertinent activities from the outset of their research proposal. Learning how to use the best practice, tools and techniques that boost the chances of achieving real impact is a stated goal of the University's excellent research support services and training. Our impact case studies have all benefitted from this support. To date, our pioneering inter-disciplinary research with impact is enabled and supported through established stakeholder networks, such as those with the adjacent Swansea Bay University Health Board and other local healthcare providers.

Staff may submit applications to a centrally administered Research Impact Fund which is a popular funding call to drive and support impact in health, energy, technical development, and associated



STEM disciplines and those within the EPSRC remit. Funding is available to support impact projects, some in conjunction with other universities in Wales, and travel grants to foster networking and support impactful collaborations aimed at kick-starting and sustaining an impact culture. Funding from the CHERISH Digital Economy Centre supports collaborative projects aligned with the EPSRC Digital Economy theme. Our research strategy and REF impact case studies are supported through these and other funding mechanisms to develop further indicators of success and to target the dissemination pipeline and evidence base for future impact studies.

### 1.5 Research integrity

The unit is at the centre of institutional support for **research integrity**, with staff having held pivotal cross-campus roles implementing and monitoring compliance with the Concordat to Support Research Integrity. Overseen by the Research Integrity office and supported by the University Data Protection Officer, staff have access to specialist advice and input at all stages of the research process, thus ensuring the highest standards of ethics and integrity are always met. Staff are further supported by online and face-to-face mandatory training and professional development opportunities (e.g., Epigeum's online research ethics and integrity training course) provided by a dedicated governance and research integrity team to help ensure research is conducted in adherence with all relevant ethical and legal standards.

Local (i.e., departmental) and College-wide ethics and research governance systems provide a professional framework for the conduct of research and interface with wider, University-based support for research integrity. All unit staff and student applications for ethical approval are made online (Infonetica), with membership of the ethics committees rotating across staff to ensure equal representation from all levels. Staff applications for sponsored research approval from NHS RECs are handled by dedicated advisors, who provide regular training and development opportunities for PIs, students, and externally funded postdocs and research assistants. Our postgraduate research (PhD) and taught masters (MSc) students also undertake these opportunities for research integrity training, thus ensuring they have working knowledge of these important principles at the start of their research careers.

### 1.6 Reproducibility and open-access practices

Unit staff are actively engaged with, and advocate for, scientific reproducibility and open access research practices at a national level. A local, Swansea branch of the **UK Reproducibility and Open Science Network** and *Reproducibilitea Journal Club* (chaired by **Wilkinson**) hosts regular 'lunch and learn' journal-club discussions led by early career researchers. Staff are encouraged to adopt other open science activities, such as preregistering studies, and of sharing published datasets and analysis code/pipelines.

Swansea University has an established history of engagement with **open access** research practices and recently established the (Welsh) Centre for Open Scholarship. The aim of this Centre is to lead on the development of the principles, advocacy, processes, and systems to support and enhance Open Scholarship. In accordance with existing University-wide open science initiatives, and in line with UK/EU, international and charitable funding bodies, Welsh and UK Government, REF, and as a signatory to sector-led initiatives such as the **Concordat on Open Research Data** and DORA, the unit fully embraces the principles underpinning Open Access (of outputs, related datasets, and code), and has put policies, systems, and processes in place to embed Open Scholarship across its activities.

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Unit staff comply with the open access (OA) mandate to upload all research outputs to the internal staff Research Information System and publicly accessible OA and Research-Data Repositories (CRONFA). Dedicated members of the Library and Information Services oversee compliance, and staff are supported by a dedicated, College-administered OA Fund to pay for article processing charges for Gold open access. Requests are considered by REF Team members, overseen by the REF Coordinator and College Director of Research, and may be submitted at any time. Priority is reserved for world-leading or internationally excellent (4\*) outputs and for research supporting impact case study development; 60% of our outputs selected for REF submission are Gold OA or OA compliant, and the remainder were out of scope.

Driven by the University's Policy on Research Data Management, staff are supported by a centrally administered dedicated website to achieve the highest standards in the management of research data and records. The site provides guidance for Swansea University researchers on expectations, obligations, advice, and support for research data management, and emphasizes why such practices are fundamental to both high-quality research and academic integrity.

## 2. People

### 2.1 Staffing strategy and staff development

**The unit has grown substantially** during the REF period, driven in large part by its world class research profile and enabling environment. In 2013, the unit comprised 19 academic staff (7 Professors, 5 Associate Professors, 5 Senior Lecturers, and 2 Lecturers), most of whom have been retained since REF2014. The unit's Category A submitted staff now comprises of 28 permanent academic staff (26.5 FTE) in enhanced research career pathways (10 Professors, 7 Associate Professors, 6 Senior Lecturers, and 5 Lecturers) all of whom have permanent contracts. Our growth across all grade levels is obviously welcomed, while the sustainability and growth among early career researchers (such as Lecturers and Tutors) speaks to the vitality of the staffing strategy. All staff in enhanced research roles are supported by staff teams in teaching enhanced roles, many of whom were appointed since 2014.

All academic staff in research-enhanced posts have considerable methodological expertise and conduct innovative, contemporary research. Most new appointments are full-time, continuing (permanent) posts; the remainder are fixed-term appointments with the possibility of extension. All new, probationary staff are supported by dedicated start-up research funding (e.g., to cover equipment costs) and reduced teaching loads, and all staff are individually mentored by a senior colleague with regular opportunities for peer appraisal and professional development training. We support fixed-term staff to apply for permanent positions, and many of our new staff have joined us via this route, while others have completed doctoral studies and undertaken tutor roles or teaching fellowships before taking up their first post.

Research activity roles and responsibilities always include both senior and junior members of staff for the purposes of succession planning. For instance, one senior member of staff of international standing in food and eating behaviour research (Benton) is scaling back his FTE commitment while mentoring and advising colleagues in all aspects of research income generation, supervision of doctoral students etc., to ensure that the UoA continues to be a renowned centre for world leading research in this area.

Flexible return-to-work policies following parental leave, such as reduced workload, and ongoing support for staff with significant caring responsibilities ensure that unit staff welfare is prioritised, and people are afforded space to flourish.

Our strategy supports integrating of clinical-based academics with fractional appointments to bridge the gap between evidence and practice. NHS and private-based colleagues include Fisher, with experience in rehabilitation from acquired brain injury, Davies and Gray, both of whom retain clinical forensic posts in offender management and the criminal justice system, and Kemp, who retains an honorary NHS research position as part of a large, HCRW-funded project. Unit staff also hold visiting appointments with international universities (e.g., Dymond has been Visiting Professor at Reykjavik University, Iceland since 2015), thus ensuring sustainable and productive opportunities for research collaboration and student exchange.

The unit provides **formal support for early career researchers** aided by centrally administered development and training services structured according to the 4 domains of the Vitae Researcher Development Framework. Since 2018, the University's competitive Florence Mockridge Fellowship programme has supported one early career researcher from the Unit every year to achieve their personal and professional potential. Each month for six months, Fellows meet to be trained in the skills needed to be successful in their pursuit of externally funded fellowships. Swansea academics of the highest calibre provide mentorships throughout, and sessions are supported by bid writers and research development managers from Research, Enterprise, and Innovation Services. To date, the Fellowship has supported submission of competitive, early career bids (e.g., to BRACE Alzheimer's Research and ESRC). Early-career collaborations are further fostered and maintained by fellowships and seed-corn funding awarded from the Welsh Crucible, a development programme for future research leaders.

In addition, the unit participates in a programme of centrally organised workshops and symposia offered by Swansea University Research Forum (SURF), Research, Engagement, and Innovation Services (REIS) and inter-disciplinary centres such as Digital Economy Research Centre (CHERISH), and ad hoc events with colleagues in the adjacent Medical School and Data Science Buildings.

Annual professional development review (PDR) processes give non-probationary staff opportunities to update key performance indicators (KPIs) and other metrics to assess pathways progression. In conjunction with the needs of the individual and the unit, and the identification of training needs and other support, the PDR process enables our staff to realise their potential. Striving for personal and collective excellence is informed by discipline specific KPIs benchmarked for career stage.

**Academic promotions** are based on excellence and are conducted following probation in accordance with the University's Strategic Plan and with annual opportunities to submit and receive feedback on applications. **Since 2013/14, 11 staff were promoted through the enhanced-research academic career pathway: four to Professor (one female), three to Associate Professor (all female), and four to Senior Lecturer (three female).**

As well as centrally supported new posts, our increased research income continues to generate new posts: for instance, in 2017, the unit was awarded its first Marie Skłodowska-Curie Award Ser Cymru/COFUND Fellowship, with provision to establish a permanent academic post on completion. Dymond's research on gambling-related harms has during the review period led to the recruitment of 7 externally funded researchers and a dedicated bid-writer to increase and sustain the unit's research capacity.



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Support for transitioning from fixed-term research roles to permanent teaching and research positions is central to our staff development strategy. The establishment in 2017 of several, fixed-term Tutor in Psychology posts (4 in 2017, 6 in 2018, 4 in 2019) fosters ongoing integration into the unit's research culture for early career (post-doctoral) staff and opportunities for further career progression with five former tutors having taken up permanent lectureships in the Department and elsewhere. All Tutors possess research-based PhDs and have track records of publishing in their chosen fields; their career development is supported and accelerated through mentorship and collaborative research working practices.

Despite growth, we have ensured research time is protected by workload models, reduced teaching loads for three years, blocked-semester teaching, and regular sabbatical and study leave opportunities. For illustration, Williams' sabbatical facilitated her impact case study of a novel measure of acquired brain injury impairment, while Tree produced new funding streams, neuropsychological research collaborations and consolidated his professional role in the Experimental Psychology Society. Dymond's sabbatical, supported through funding from Health and Care Research Wales, will establish a centre of excellence for research, education, and treatment of gambling-related harm. The unit has also supported three periods of secondment to international research sites (Reppa was seconded to Quebec, Canada; Tucker to Stockholm University and Karolinska Institute, Sweden; and Weidemann to the University of Pennsylvania, USA).

As well as unit expertise and knowledge, staff are supported in all aspects of research development, design, funding, implementation, dissemination and impact by a College-based REF Manager, Life Sciences Hub Research Development Officers, Impact and Engagement Officers, and adjacent expertise in the Clinical Trials Unit, Research Integrity Office, and Marketing and International Recruitment and Press Office/Public Relations teams.

## 2.2 Research students

The development, training, and supervision of postgraduate research students (PGRs) is overseen by the **PGR Academy**. The Academy oversees and monitors student progress and arranges training and development opportunities for PGRs, while providing a cutting-edge research environment. The PGR Academy benefits from representation and input from unit staff as academic leads.

Recruitment of PGRs has increased considerably during the review period, with over 50 students (a 26% FTE increase on REF2014) currently supervised by unit staff. All Category A staff supervise doctoral students (1.43 students per member of staff). During the census period, a total of 44 research doctorates (PhD) were awarded. In keeping with our goal of being an inclusive and diverse environment in which to excel, the cohort reflects the equality and diversity of the unit and includes 11 students with protected characteristics.

Many current MPhil and PhD students come via our MSc postgraduate training courses, and several are in receipt of competitive sources of funding such as from:

- ESRC Doctoral Training Programme (DTP) Wales Collaborative and General Studentships (3 since 2018),
- International collaborative university studentships such as the Oklahoma-Swansea (2 to date) and Grenoble-Swansea (2 to date) partnerships,
- Coleg Cymru who funded one Welsh language student (and who has since obtained a lectureship based on teaching and assessing the undergraduate psychology curriculum through the medium of Welsh) and are currently supporting another,

- and other, externally funded providers (e.g., GambleAware, BRACE, Ministry of Defence, and British Heart Foundation).

Moreover, the recent addition of the Masters in Research (MRes) pathway and industry-sponsored Knowledge Economy Skills Scholarships (KESS) studentships (3 completed/underway) have increased the range and quality of postgraduate research conducted in the unit. Collaborative (i.e., cross-College) supervisory teams ensure PGR students have access to contemporary multi-disciplinary expertise. Several staff have experience of international PhD supervision (e.g., with KU Leuven), and the presence of competitive, institution-wide studentships with international partners (e.g., Grenoble) speaks to the dynamic nature of supervisory regulations and student capacity building. Annual studentship competitions afforded by the unit's involvement as one of three centres in the Psychology Pathway (in conjunction with Bangor and Cardiff Universities) for ESRC DTP Wales funding has thus far led to 3 funded studentships at present, 2 of which involve an inter-disciplinary supervisory team.

Our students benefit from **research support funding of up to £750 per taught masters student** towards the costs of conducting their MSc research projects. Applications to this fund are administered once a year by a committee with representatives from the research themes. Requests for funds have increased every year of operation, with staff and students generally favouring using the money to reimburse participation in online, lab- and field-based studies. Similarly, all PGR students benefit from generous **conference travel and research support funding** of £1000 during their candidature. This funding is College-wide and has been used for a wide range of dissemination and research support activities (e.g., conference presentation and attendance, workshop organization, and purchasing research consumables).

Networking, pastoral support and social events are managed by organic clusters of PGR students with weekly social events overseen by a member of staff as the PGR Lead. Calls and announcements are circulated via in-house mailing lists and our students host social events and guest presentations in a dedicated PGR room and flexible meeting space. The PGR room also serves a 'hot-desk' function for visiting research students, while the unit's students have availed of study abroad opportunities, such as to KU Leuven (funded by Santander).

All PGRs have dedicated office space and computing facilities as befits their research topic and most share office space with up to four other students. Postgraduate research students are supported through a centralised IT system (*eVision*) that allows for monthly updates and recording of progress across specific candidature milestones. The system, supported by the online Academic Guide, monitors attendance, records engagement details, target-setting, training need analysis and performance review.

The unit adopts a PGR student **supervisory team model** ensuring that junior staff gain experience of successfully supervising research students to completion. Most staff actively supervise several students, with junior staff given experience of supervision as members of supervisory teams before being eligible to be primary supervisor. Supervisor training is mandatory and has been completed by all staff. Open calls for internally funded studentship proposals (such as the Swansea University Research Excellence Scholarships) are circulated regularly. Our PGRs' skill development is further supported through training in small-group teaching and assessment. The **annual PGR conference** is organised by the **PGR Academy** and provides students with experience of presenting their work in a supportive environment; indeed, several of the unit's students have won prizes for the best presentation at this popular event.

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National and locally organised public engagement opportunities for PGRs, such as *3 Minute Thesis* and *FameLab* are enormously successful, with **unit representation at UK finals** of both competitions. Organising and hosting other outreach events such as *Pint of Science* and *Soapbox Science* – led by female researchers and PGRs – and the recent on-campus hosting of the *ESRC Festival of Social Science* series and the *British Science Festival* helps ensure a wide dissemination and impact base for our research.

We encourage PGRs to pursue externally funded post-doctoral opportunities through informal mentorship from their supervisory team and the provision of dedicated workshops and training events based on the Concordat Framework from the University's **award-winning PGR Office**. Students may view and book formal workshops on themes such as 'Managing information and data', 'Leadership and working with others', to 'Academic writing', choose from a range of online and e-courses, and participate in locally delivered initiatives such as the unit-organised Peer Academic Writing Support which provides PhD students the time and place for protected writing time and support from their peers to improve their writing/encourage writing output. Structured programmes are available through the University's Development and Training Services, while PGRs have opportunities to tutor, demonstrate and teach throughout their candidature, hence enhancing their employability skills. Input from students on all aspects of their candidature is ensured through PGR representation of the College Research Committee. Supported by such initiatives, most research students co-author papers with their supervisors and many do so during their candidature.

The health and wellbeing of our PGR community is of paramount importance, and we provide a range of support services. These include dedicated support pages on the University website for PGRs, programmes offered by Wellbeing Support such as free access to an online cognitive behavioural therapy programme and a stress control course, numerous self-help resources, one-off support sessions (individually and group), access to NHS courses and counselling, and specialist support for learners with autism.

### 2.3 How the unit supports and promotes equality and diversity

We take seriously our responsibilities as part of the **Concordat to Support the Career Development of Researchers** and strives to facilitate and maintain an internationally renowned, diverse, inclusive, and supportive environment where individuals may flourish. Staffing strategy is supported by Swansea University's Investors in People status and College Athena SWAN Silver award. The **balanced demographic profile** of the unit illustrates equality and diversity; we now have a higher percentage of female staff (53.5%) compared to 13/14 (30%). Of the 28 (26.5 FTE) returned staff, 15 are women (3 Professors, 3 Associate Professors, 5 Senior Lecturers, and 4 Lecturers) and 13 are men (7 Professors, 4 Associate Professors, 1 Senior Lecturer, and 1 Lecturer).

In a development from our REF2014 submission, our UoA now includes part-time as well as full-time researchers from a wide age-range and nationalities. In line with the University's Code of Practice and our unit Statement of Intent, the team making the decisions on the final selection of outputs all received mandatory unconscious bias training and targeted REF specific training. The submission comprises the one best-quality output from each Category A submitted staff member with the balance made up of the best-quality outputs from the available pool of eligible outputs that includes outputs of former eligible colleagues.

The University is a member of **Stonewall's Diversity Champions Programme**, and the College has established its own Diversity and Equality Committee to promote equality in areas of age, religion and belief, disability, gender, race, and sexual orientation. The unit champions these principles at all

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levels of its activities. Encouraging and supporting an excellent research environment for all is facilitated by the College and University **Athena SWAN (Scientific Women's Achievement Network) Silver award** recognising gender equality.

Local, departmental initiatives further support and enable staff research careers. For instance, staff are supported by generous parental leave arrangements and individual circumstances, such as protection from teaching on return from leave, which have helped ensure equality.

### 3. Income, infrastructure and facilities

#### 3.1 Income, funders, and prestigious projects

In line with stated objectives, **grants awarded increased by 168% over the census period**, and from an increasingly **diverse range of funders**, such as:

- UK Research and Innovation
- Research councils (e.g., ESRC)
- European Commission (e.g., Marie-Sklodowska-Curie Actions),
- UK charities (e.g., Forces in Mind Trust; Brace-Alzheimer's; GambleAware; British Medical Association),
- Welsh Government (e.g., Health and Care Research Wales),
- commercial/industrial partners (e.g., PepsiCo; European Fruit Juice Association),
- and overseas funders (e.g., US Government's Defense Advanced Research Projects Agency; International Center for Responsible Gaming).

Our growth in research income has helped increase the scope and depth of the unit's applied research environment. Moreover, the increased income has helped to ensure the sustainability and vitality of our research themes in several ways. First, it has consolidated the unit's status as a world-leading centre of excellence for cognitive neuroscience and clinical and health psychology research. For instance, funding for gambling addiction research (from Welsh Government) and on the impact of and recovery from COVID-19 within the prison population (from UKRI) are two notable recent examples of high-profile awards in our areas of expertise.

Second, it has driven our staffing strategy through the appointment of new staff, across all levels, who contribute knowledge and contemporary research expertise to our established themes.

Third, our increased income level has afforded senior staff opportunities for teaching buy-out to allow them uninterrupted periods of research time or to undertake periods of research leave. This has benefitted the unit through high-quality research outputs and impact case studies (both current and future), submitted bids for funding, and creation of collaborative networks.

Fourth, achieving our strategic aim of doubling our research income allows for ongoing investment into research facilities and equipment, with all groups benefitting from this capital expenditure.

Fifth, the recruitment of research staff and PhD students to externally funded projects have enabled succession planning and helped foster a supportive, productive environment where early career researchers may flourish. For instance, international research funded by PepsiCo. combined psychology, physiology, nutrition, and neuroscience to provide the first evidence that small changes in hydration (<0.6%) have consequences for brain functioning, as demonstrated in a fMRI study. Further, related multidisciplinary research funded by an industrial partner (Neolife) has generated a

## Unit-level environment template (REF5b)

novel knowledge base concerning the influence of cinnamon cassia on glucose tolerance and interoceptive processes underpinning appetite and emotional regulation in older adults.

Finally, as our five-year strategy (Section 1) makes clear, we will use our growing research income to support a strategic and responsive approach to external funding and investment and to ensure a positive international profile for our research. Access to University-wide funding schemes (e.g., Swansea University Research Grant Enabler and Texas Strategic Partnership Grants) and dedicated bid-writers and administrative support for strategic funders such as the European Research Council, will help to ensure that staff are facilitated in securing a growing volume of research income.

### 3.2 Infrastructure

Our world-class research infrastructure is supported by a dedicated team of three psychology technicians, including software support and lab managers, backed by wider College IT and technical services teams. Unit staff benefit from annual funding calls to purchase research equipment and software, consumables, participant remuneration, and MRI scanning costs. These calls offer flexible funding arrangements, responsive to the world-leading questions and initiatives of our internationally renowned staff.

Following significant investment (£5.2M) in cognitive neuroscience capability as part of the Welsh Government-funded Wales Institute for Cognitive Neuroscience, unit staff have access to dedicated scanning time and analysis facilities in the ILS Imaging Centre which has generated world-leading research projects and outputs. For example, our Marie Skłodowska-Curie Award Ser Cymru/COFUND Fellowship research project was based in the Department and the adjacent, on-campus imaging facilities and behavioural testing suites. Students pursuing the MSc in Cognitive Neuroscience undertake weekly scanning as part of their studies, helping to ensure future research capacity.

The **local infrastructure** for supporting research and enabling impact is a significant factor in our successful strategy to increase income and facilitate productive collaborations with end-users. **Dedicated Research Development Officers (RDOs)** based in the adjacent Life Sciences Research Hub support and manage our growing research income. Our team of three RDOs provide support and guidance to academics, principal investigators and professional services in all work associated with the preparation, formulation and application for international research funding and award in the Department of Research Engagement and Innovation Services (REIS). In conjunction with unit staff, they use the University's **Award Management System** to progress and validate grant applications and help ensure that the highest quality of applications are developed and submitted to sponsors. Interacting closely with Hub based RDOs, legal and contracts support staff, bid writers and research support advisors, individual unit staff Principal Investigators are central to the customer centric, streamlined, and robust processes aimed at meeting the needs of the University, its customers, and external stakeholders. These goals are supported by a dedicated, unit-wide, full time REF Coordinator role.

Staff liaise with the Hub early in the bid development process and together they ensure a robust quality enhancement process for both bid writing and technical review for all applications. On receipt of funding, unit staff are assigned an RDO and a post-award contact in REIS to account manage their grants and contracts. The **Principal Investigator Project Accounts** online system helps Principal Investigators, Project Managers and Administrators to access financial data easily and conveniently.



The effective development and promotion of research is overseen by the **College Research Committee** (which is chaired by unit staff (Tree) as Director of Research) and supported by university wide research services just described. Guided by the **College Research Strategy**, staff are facilitated with bid development and informed about research funding opportunities through College-led calls, weekly email newsletters, and targeted announcements from REIS. Mandatory peer review of large bids (>£100K) is overseen by REIS, and internal review is encouraged for all bids, particularly those from junior staff, to ensure high-quality, successful applications.

Research-related issues, such as open science and reproducibility practices, and the sharing of potential funding bids are discussed at informal '**journal-club**' lunchtime meetings in the Department with key elements of strategy agreed at research away-days and appraisal held during individual professional development and review meetings with line managers. The unit has developed an effective and popular **grant incentivisation** scheme underpinned by the College Research Strategy where workload reductions or instances where a proportion of indirect costs may be transferred to individual Principal Investigator holding accounts and used to fund conference travel, pilot data collection, research participant remuneration, or article-processing charges.

### 3.3 Facilities

The unit's established international reputation for high-quality research with impact is supported by ongoing investment in equipment, facilities, and technical support for our research. A programme of commitment to increase our research capacity has produced several **world-class laboratory facilities** capable of addressing a range of important challenges.

Examples of investment in, and development of, significant research clusters leading to impactful research may be found in **Cognitive Neuroscience** where our state-of-the-art facilities include:

- The **Institute of Life Sciences Imaging Centre**, which has excellent facilities for 3T structural and functional MRI and magnetic resonance spectroscopy (MRS). The Centre, located beside the Department of Psychology, houses our 3T Siemens Magnetom Skyra scanner with 32-channel head-coil and a range of bespoke analysis software such as MEGA-PRESS and GANNET for quantification of MRS data.
- A 24 channel Artinis Oxymon 3 **Near Infra-Red Spectrometry (NIRS)** system for measuring task-related haemodynamic changes in the first 2 cm of depth of the cortex. In addition to traditional quantification of task-related functional activity changes, staff have developed an interface which permits investigation of data obtained in real-time and to determine the effect of training of that regulatory ability on cognitive task performance.
- The **Brain Plasticity Lab**, which houses a **suite of transcranial direct current and electrical stimulation (tDCS and tES) systems**, such as the wearable and wireless Neuroelectronics Starsim 8 and electroencephalography (EEG) monitor with NIC2 software interface. Starsim may be fully integrated with functional near-infrared spectroscopy (fNIRS), allowing for portable and wireless tES experiments concurrently monitored by both EEG and fNIRS. Our tDCS system, the DC-Stimulator (neuroConn), is MRI-compatible, has full double-blind capabilities, and is used in behavioural and neuroimaging studies investigating attentional control and memory in young and older adults.
- High-density **ActiveTwo BioSemi EEG electrode arrays** with BESA analysis software and customised response capture equipment housed in a shielded testing lab for use in research on human cognition, action, and perception.

- And several labs equipped with **SR Research Eyelink eye-trackers** for use in attentional and implicit cognition paradigms.

Research in our **Clinical, Health and Forensic Psychology** theme is supported by a range of facilities including:

- The **Swansea Sleep Laboratory**, which is accredited by the European Sleep Research Society, has two bedrooms equipped with full polysomnography facilities.
- The **Experimental Psychopathology Lab**, which is dedicated to threat and avoidance learning, houses a suite of interfaced BIOPAC psychophysiology facilities including isolated and MRI-compatible stimulators (to present aversive stimuli), wireless electrode arrays to record skin conductance and electromyography (EMG) for fear-potentiated startle research, and electrocardiography (ECG) for phasic heart rate or baseline heart rate variability assessment.
- The **Nutrition and Behaviour Lab**, which houses BIOPAC psychophysiology equipment, cognitive test tasks, food preparation facilities, and state-of-the-art equipment for measuring body mass and hydration. Further facilities include adjacent labs for analysing cortisol, and a -80° degree freezer for collecting and storing biological samples such as urine, blood, and saliva for longitudinal studies of the effects of food and drink consumption on mood and cognition.
- And the **Baby Play Lab**, which is a multi-room, child-friendly observation, and testing space for the study of typically developing infants and parents' behaviour.

In addition to these specialist facilities, the unit has a wide range of bookable general-purpose behavioural testing labs and access to further research infrastructure in the Centre for Innovative Ageing and School of Management.

#### 4. Collaboration and contribution to the research base, economy and society

The unit's emphasis on applied/translational research embeds it within numerous regional, national, and international collaborative networks of stakeholders, policymakers, and beneficiaries. As evidenced in our outputs and impact case studies, staff collaborate internally, with researchers from other faculties, and with international-based colleagues on a range of translational research projects.

##### 4.1 Highlighted collaborations and contributions

Much of our research is rooted within the local South West Wales community, with A Regional Collaboration for Health (ARCH) representing perhaps the most tangible evidence of our local collaborations and contributions. ARCH is a unique partnership formed between Swansea University and Abertawe Bro Morgannwg (ABM) and Hywel Da University Health Boards. In 2017/2018, ARCH became one strand of the City Deal awarded by the UK Government to the Swansea Bay City Region. Unit staff are therefore key players in ARCH working with local authorities and industry to influence health, housing, education, transport, and regeneration across the region. The development of Health and Life Sciences campuses at Singleton is a tangible consequence of the ARCH partnerships. Indeed, since 2017, the Health and Wellbeing Academy at the College of Human and Health Sciences at Swansea University – the only service of its kind in Wales - has treated 2,700 new patients (including 70 in the community who would otherwise be on NHS waiting lists), delivered 15 different health and wellbeing services, worked with 6 different charities and 7 regional businesses.

## Unit-level environment template (REF5b)

New and existing collaborations and opportunities for knowledge exchange are facilitated by a regular invited speaker departmental seminar series held at lunchtime and advertised across campus. Staff host overseas senior researchers on sabbatical (more than 5 to date), such as the outgoing Editor of *Psychological Science* in 2019.

Our international collaborative research projects and grants activity is considerably higher than the world average. For example, Kemp's large-scale, **multi-site epidemiological research on the health and wellbeing of the Brazilian population** (ELSA-Brasil project) places research end users at the heart of the process and has led to several high-profile publications. Further collaborations with colleagues from University College London on the Whitehall II Stress and Health study, a position on the advisory group of the Human Affectome Project, the publication of training manuals to manage loss of identity following acquired brain injury, and recognition by government and local health boards are testimony to the benefits of the unit's research-informed service delivery model with direct stakeholder involvement. Weidemann's work with the University of Pennsylvania on the **development of neuro-prosthetic devices using intra-cranial recording with epilepsy patients** has identified biomarkers for semantic and episodic memory ability, resulting in colleagues from prestigious US-based research labs contributing to outputs in leading journals like *Nature Neuroscience*. Facilitated by a two-year secondment funded by the US Department of Defense, this collaboration has generated state-of-the-art innovations in data capture, stimulation, and analysis with enormous translational potential.

### 4.2 Relationships with beneficiaries

Staff regularly provide **expert testimony to government and policymakers**. Dymond's work on the neuroscience of slot-machine gambling was presented to the *All-Party Parliamentary Group on Gambling-related Harm* and contributed to UK-wide legislative change in stake-size reduction. Dymond's other contributions include contributions to the 2017 annual report of the Chief Medical Officer for Wales, and his recent appointment to the Welsh Government's Task and Finish Group to implement its recommendations. Recently, he contributed to a commissioned report for Public Health Wales on area-based vulnerability to gambling-related harm in Wales, is a member of the Senedd Cymru Cross Party Group on Gambling.

### 4.3 Wider activities and dissemination

Disseminating our research is facilitated by Oriel Science, which aims to create accessible, informative, and interactive science exhibitions in the community. It is a research-led, hands-on science centre, designed for all ages. Unit staff have played pivotal roles in its development and contribute to Super Science Swansea and Oriel Science Café public dissemination and engagement events.

Unit research directly involves end users as co-creators throughout all stages of the process, from design to implementation. For instance, Blagrove's interactive research on sleep and dreaming holds regular events at the British Science Festival, British Science Week, the University of California at Los Angeles, and recently held a dedicated conference on arts and health in Swansea in June 2020. This dynamic work is shaped and informed by the direct involvement of members of the public in settings such as the Freud Museum in London and local art galleries (e.g., Glyn Vivian). At the events, participants report their dreams and have the opportunity of capturing them in real-time as visual illustrations accompanied by scientific interpretation. An invited textbook is in progress based on the outcomes of this research engagement with end users. Blagrove recently hosted the *ESRC Festival of Social Science* and *Swansea Science Festival* where members of the public interacted

with scientific demonstrations and participated in large-group studies of a range of psychological phenomena.

Our **research appears regularly in online, TV and print media**. For instance, over the review period, Reed's Internet addiction research was featured in *Charlotte Church - Inside My Brain* (BBC, 2018), a CBS/Netflix Documentary – *Click for Murder* (2017), on the Discovery Channel's *Through the Wormhole with Morgan Freeman* (2014), and in numerous radio and TV news, newspaper, and news website features. Burianova's work on language and memory specialisation of the brain was featured in documentary episodes – *Redesign my Brain* – on ABC TV in Australia (2013). Staff regularly feature in BBC and ITV local news and documentary programmes, such as problem gambling (*ITV News Wales This Week*) and cognitive decline (BBC Wales). Staff regularly engage with research end-users and other interested stakeholders via online dissemination networks such as articles in *The Conversation*.

All staff regularly undertake peer review for specialist journals in their domain and edit special issues or topics. Among wider activities, many staff hold leading editorial positions with a range of journals:

- Editor-in-Chief (Reed) for *Learning & Motivation*.
- Eleven Associate Editor roles with journals including *PLoS ONE*, *Frontiers in Psychology*, *Frontiers in Psychiatry*, *Criminal Behaviour and Mental Health*, and *Journal of Developmental and Physical Disabilities*.

In addition, our staff serve on review/grants committees for national organisations such as Medical Research Council, Economic and Social Research Council, Biotechnology and Biological Sciences Research Council, Wellcome Trust, and National Institute for Health Research, international funders such as European Research Council, European Science Foundation, National Health & Medical Research Council Australia, Australian Research Council, Israel Science Foundation, German Research Foundation, Research Foundation Flanders, and Netherlands Organisation of Scientific Research, and charities such as Action on Hearing Loss and Alzheimer's Association, among others.

#### 4.4 Recognition of esteem

Research excellence is recognised through **prizes and awards** won by unit staff, such as:

- the *Medal of the President of the Republic of Italy* for outstanding scientific contribution to society (Reed).
- Jacobs Foundation Junior Scholar (Ellis-Davies).
- Doctor of Science, University of Melbourne (Kemp).
- *Working in Partnership' Award*, Abertawe Bro Morgannwg University (ABMU) Health Board and College of Human and Health Sciences (Tree).
- *Chairman's VIP Award for Commitment to Research and Learning*, ABMU Health Board (Reed).
- Health and Wellbeing Academy, *Research and Innovation Award for Outstanding Impact on Health and Wellbeing*, Swansea University (Kemp).
- Elected Fellows of the *Association for Psychological Science* (Kemp), *Association for Contextual Behavioral Science* (Dymond), and *The British Psychological Society* (Blagrove, Tales, Tree).
- Welsh Editor's Award for Journalistic Excellence, *The Conversation* (Kemp).
- Best Paper Award 2019 - *Attention, Perception, & Psychophysics* (Reppa).

**Unit-level environment template (REF5b)**

Our staff regularly give **invited keynote presentations**, conference talks and guest lectures at sites such as the MRC Cognition and Brain Sciences Unit, University of Leeds, University of Liverpool, University College Cork, Bangor University, South Australia College of Forensic Psychology (Adelaide), Victoria College of Forensic Psychology (Melbourne), and at conferences such as the 12<sup>th</sup> Conference on Applied Behaviour Analysis, Milan, Italy, the Experimental Psychology Society, The Association of Anaesthetists of Great Britain & Ireland, Nordic Institute for Advanced Training in Occupational Health, the University of Angers, Laboratoire de Psychologie des Pays de Loire, France, and Institute of Cognitive Neurology, Buenos Aires, Argentina.

Several international conferences have been hosted in Swansea and/or organised internationally by unit staff since 2014, including the 10<sup>th</sup> European Meeting on Human Fear Conditioning, the British and Irish Group for the Study of Personality Disorder, three annual meetings of the St. Andrews-Swansea Neurobehavioural Outcome Scale group, Judgment and Decision-Making Preconference, and the Experimental Psychology Society Summer Conference.

As well as UK universities, staff regularly examine PhD theses for international institutions (e.g., KU Leuven, Belgium; Swinburne University, Melbourne, Australia; University of Auckland, New Zealand; National University of Ireland, Galway; University of Copenhagen; University of Western Australia).

With continued investment and close alignment to our strategic aims, our reputation for international quality, collaborative translational research conducted in an excellent, supportive environment will continue to thrive.