

<b>Institution:</b> <b>Heriot-Watt University</b>
<b>Unit of Assessment:</b> 4 Psychology, Psychiatry and Neuroscience
<b>1. Unit context and structure, research and impact strategy</b>

## Introduction

The UoA is comprised of 13.1 FTE research-active academics aligned to a newly established research centre and sits in the School of Social Sciences (SoSS), one of five Schools of Heriot-Watt University (HWU). Excelling in research with a focus on impact is one of the four strategic aims of HWU.

The Unit's 2021 submission builds on strengths in staff recruitment and development as well as national and international collaborations as noted in the feedback from the REF2014. This submission reports sustained improvement over this cycle: most notably in terms of our interdisciplinary credentials, public engagement, facilities, grant income and staff development.

Psychology at HWU aims to address societally-relevant research questions in health, well-being and in cognitive and behavioural change. Important contemporary and future issues include interventions for an ageing population, multilingualism and the promotion of language diversity, memory consolidation, mental health across the lifespan and human-computer/robot interaction. Our research is organised into three research themes: 'Cognition, Brain and Behaviour', 'Lifespan Health and Wellbeing' and 'Work, Society and Environment' (described in detail below).

Our strategic aim has been to focus on applied and interdisciplinary research and leverage our public engagement capability to work directly with the people impacted by our research, as well as through intermediary organisations. Consequently, we have broadened our collaborations with other disciplines both within and beyond HWU. This focused research strategy has led to the recruitment and development of staff and PGR students at all stages in clearly defined areas of expertise.

Major highlights include:

- EPSRC-funded social robotics research in autism (£870k) as part of the Edinburgh Centre for Robotics;
- interventions for healthy cognitive ageing and dementia research (The Intervention Factory funded by Velux Stiftung, £407k;
- A Tablet for Healthy Ageing funded by The Dunhill Medical Trust, £74k;
- Alzheimer's Society funding for a variety of research, including a Junior Fellowship totalling £357k); and
- understanding mechanisms for memory consolidation (Wellcome Trust Funding, £80k).

The two submitted case studies 1) '*What keeps us sharp? Increasing public awareness of the lifestyle factors that promote brain health*' and 2) '*Decarbonising Road Freight using Behavioural Science Interventions*', underline the relevance of the units research to real world problems.

## Structure

Psychology at HWU is situated within the School of Social Sciences (SoSS), which was created as a School by HWU in 2016 to consolidate research in fields focussed on people and society. Bringing together academics from Psychology, Management, Languages and Intercultural Studies, SoSS

## Unit-level environment template (REF5b)

now facilitates cross-disciplinary collaboration. The UoA retains its fundamentally science-based approach but has benefited from relocating to SoSS because of the broader academic landscape, greater resourcing and the physical relocation of staff in one a single location; evidenced through investment in staff (see Section 2), facilities and equipment (see Section 3) [Total investment in facilities and equipment: £619k]. Further, Psychology PGR students benefited from becoming part of a wider community of social science students through access to enhanced research methods training and career and skills development opportunities, including membership of the new SoSS Doctoral Centre (see Section 2).

More specifically, having Psychology structurally and physically relocated within social sciences has also afforded staff better access to laboratory facilities, joint PhD supervision opportunities and development/mentoring opportunities to build collaborative outreach and impact. For example, Psychology has been integral to social and developmental robotics research, playing a central role during the HWU Year of Robotics 2017, which was widely covered in local, national and international media across radio, TV and print news (See Section 4). In 2019, Psychology led the HWU Year of Health and held events including Brain Health Day – where research results on the beneficial links between taking up a new activity, ageing and cognition was disseminated to over 300 older people and representatives of third sector organisations.

During the REF cycle, Psychology has focused on three coherent themes to better reflect our translational research: 'Cognition, Brain and Behaviour', 'Lifespan Health and Wellbeing' and 'Work, Society and Environment'. Focusing on these themes has enabled more interdisciplinary research (see Section 2 for joint PhD supervision; see Section 3 for fuller details of interdisciplinary funding). By increasing the visibility of our staff and connecting with psychological research conducted in different disciplines in HWU, we have collaboratively investigated driver behaviour, medical technologies and human computer/robot interaction.

Fourteen staff (13.1 FTE) are returned in the submission. Throughout this statement those employed pre-REF2014 are named in **bold**, and post-REF2014 in ***bold italics***. The table below maps staff against primary research themes (with brief descriptors), and highlights projects. Research for many staff with multiple specialisms cuts across more than one theme, emphasising our cross-disciplinarity.

Research Themes	Description and Highlights
<b>Cognition, Brain and Behaviour</b>	<p><i>Change, including developmental conditions, dementia / stroke patients as well as healthy adults, with strong theoretically-informed translational interventions, making use of state-of-the-art multidisciplinary techniques.</i></p> <p>The research and labs include: The Memory Lab (<b>Dewar</b>); The Developmental Psychology in Action Lab (<b>Rajendran</b>); Body and Emotion Lab (<b>Sedda</b>); Language Across the Lifespan Lab (<b>Garraffa</b>), Perception Lab (<b>Delicato</b>) and The Culture and Social Influence Lab (<b>Tamariz</b>).</p> <p>Highlights include: Study on memory consolidation (Wellcome Trust) – a collaboration between Dewar's Memory Lab and the Ageing &amp; Cognition Research Group at the German Center for Neurodegenerative Diseases; Rajendran's Developmental in Action Lab's Socially Competent Robot (SoCoRo) project (EPSRC), where robots are used to help people with autism with emotional understanding in the workplace.</p>

Research Themes	Description and Highlights
<b>Lifespan Health and Wellbeing</b>	<p><i>This theme explores health-promotion activities in children and adolescents, healthy ageing and mental health.</i></p> <p>The research and labs include: The Ageing Lab (<b>Gow</b>), Social Interaction, Mental Health, and Wellbeing Group (<b>Stewart</b>), and child and adolescent mental health (<b>Hale</b>).</p> <p>Highlights include: Gow's 'Intervention Factory' (Velux Stiftung), in which older adults took up new community-based activities to help maintain their cognitive skills, and health and wellbeing more broadly.</p>
<b>Work, Society &amp; Environment</b>	<p><i>This theme explores behaviour in the workplace, assessing risk in the environment and interventions to improve workplace performance.</i></p> <p>The research and labs include: the Star Lab/Medical Educational Lab (<b>McKendrick</b>), The Culture and Social Influence Lab (<b>Cristea</b>), driver behaviour using simulators (<b>Lansdown</b>), leadership and coaching psychology interventions (<b>Grajfoner</b>), and obedience (<b>Gibson</b>).</p> <p>Highlights include: Lansdown's ongoing programme of research in understanding the behavioural components of driving, from driver distraction to fuel efficiency driving interventions, and his research to improve societal health (promotion of sun-safety and Vitamin D consumption in construction workers, IOSH, £200k); <b>McKendrick's</b> use of virtual environments using eye tracking to reduce anxiety, and interventions to improve surgeons' performance; <b>Gibson's</b> re-analysis and revisionist interpretation of Milgram's classic obedience research.</p>

## Achievements since REF2014

The Unit has surpassed a number of targets set in out in the REF2014 submission, including a sizeable increase in research income. During the last REF period, staff held 33 competitively awarded grants (total spend £632k). **In the current REF cycle the spend was £1,639,403 (from 35 awards), which represents a 2.6-fold increase from REF2014.** Further, this momentum has led to £693k worth of grants [to be spent in the next REF cycle] being awarded since the launch of the new Centre for Applied Behavioural Sciences in 2020 (see below for greater detail of the Centre and Section 3 for grant awards). This includes:

- **Tamariz** received £97k (€106k) as part of an EU Horizon 2020 CAROUSEL+ project (€3.7million) to examine emerging paradigms and communities in AI-mediated communication through dance.
- **Garraffa** received extended funding (£25k from Bòrd na Gàidhlig) to continue work on biliteracy in Gaelic medium education.
- **Garraffa** received £22k from the Academy of Medical Sciences Global Challenges Research Fund Networking Grant Scheme for the "Early identification and intervention of children with speech and language disorders in South East Asia Region: Developing capabilities, partnerships and research." (See Section 2 for details of current joint PhD between **Garraffa** and Dr Razak from Universiti Kebangsaan, Malaysia).
- **Garraffa** received £96k from The Research Council of Norway as part of a (£690k [8 million NOK]) funded collaborative study with the Center for Multilingualism in Society Across the

Lifespan (MultiLing), The University of Oslo entitled 'Better attention, better communication? How ADHD and multilingualism influence children's pragmatic development'.

Another target set out in REF 2014 was to publish our research in Psychology journals with the strongest possible international reputations. In 2014, 66% of the outputs submitted were publications in top journal percentiles. In 2021, this is now 74% (Source: SciVal). Similarly, in 2014, 12% of the outputs were in top citation percentiles – and this has now more than doubled in 2021 to 25% (Source: SciVal).

As per our strategy, the Unit's proportion of interdisciplinary publications has also increased. In 2014, 31% of the outputs were in purely Psychology journals and in 2021, 25% were in purely Psychology journals, with the remaining outputs also attributable to 15% in Medicine, 17% in Neuroscience and 7% in Computer Science (Source: SciVal). Further, in 2014, 19 out the 47 selected outputs were from females. This ratio in 2021 is more balanced with 19 outputs selected from females and 14 from males (see Section 2 on how the Unit has been working to improve Equality and Diversity).

## Future ambitions and plans to build on success

Psychology's 2025 Strategic Plan articulates a clear research Vision: "As a 'hub' discipline we are uniquely placed to collaborate within and beyond HWU" and, so, align with the University's strategy "to create and exchange knowledge that benefits society" and "to address crucial world issues through our interdisciplinary approach". As Psychologists we conduct both discipline-specific and applied research. So, our mission is not only to create this research but to apply it for the benefit of others.

The Plan also sets out clear targets:

- Increase quantity and quality of outputs year on year (while still aiming for the most prestigious journals and raising citation counts)
- Increase grant income, especially peer-reviewed funding with overheads costs included, as well as externally funded PhD work. "£305,000 minimum as annual baseline, with a 10% year on year increase as staff develop portfolios and new staff enter; 3 externally PhD studentship per 2 internally funded."
- Further improve PhD completion rates (i.e., 4 years or less).
- To tackle issues of reproducibility in Science, the Unit will be a fully compliant Open Science Department by 2025, e.g., via The Open Science Framework and, so, include practices like preregistration of studies and data sharing. This will be done through several parallel, interrelated processes, including staff training and procedures for safe storage of data in line with GDPR. Since 2020 we have now adopted a fully integrated ethics and data protection system through Infonetica. This provides us with the mechanism for managing sensitive and non-anonymised, pseudo-anonymised and fully anonymised data that can be openly shared for scrutiny and for third-party data analysis.
- Impact Strategy: Psychology's Engagement Plan embodies the University's values. Sharing what we do with our colleagues, students and communities is about celebrating our achievements and inspiring others. It is equally about creating opportunities to be inspired by the voices of others so that new research projects are genuinely collaborative, both in terms of diverse disciplinary input and full user-engagement at all stages of the research cycle.

**Public Engagement and Impact**

The Unit has a proud history in public engagement. Psychology staff regularly participate in the Edinburgh Fringe Festival in addition to a diverse range of other science festivals and public events, and make local, national and international media appearances. Mentoring and peer support have further enhanced and embedded public engagement within the research culture resulting in broader and more frequent engagement activities by more researchers within the UoA. In addition, there has been considerable successful impact in promoting the discipline more generally both within and beyond HWU. We have deliberately positioned Psychology as a resource to improve people's lives and help them make informed choices, from how much screen time is appropriate for children to strategies for healthy cognitive ageing (See Section 4 for more specific details on Public Engagement during the current REF cycle).

Moving forward, we seek to build on these accomplishments. The 2025 Research and Engagement plan targets three levels of Engagement: Departmental, University, Community. Key actions include:

- *Departmental*: Engagement meetings to share practice, develop ideas, plan events/activities, provide training, plan grant submissions, data management and ethics.
- *University*: 'Psychology on Tap' is a campus-wide initiative to share research beyond the Department and in a non-traditional public engagement-style format. As such, staff have delivered their Cabaret of Dangerous Ideas Fringe shows to staff and students at the Student Union. The annual 'Psychology Showcase' is an outward facing event typically with 50+ attendees in which Psychology research is disseminated to the University, including experimental demonstrations and PGR poster sessions. There are including the Principal of the University.
- *Community*: Events for major national/international days or weeks (e.g., Brain Awareness Week, Mental Health Awareness Day, etc.)

**Research Centres**

Since August 2020, all Psychology research has been coordinated and managed under the umbrella of the 'Centre for Applied Behavioural Sciences' (CABS) – one of seven Research Centres within SoSS. CABS will foster the strategy for Psychology and the University's 2025 goals. Currently, CABS is comprised of 14 members, 15 associate members and 10 PGR students, led by **Rajendran** as Director, **Gow** as Deputy Director for Impact and Engagement, **Garraffa** as Deputy Director for Interdisciplinarity and Internationalisation, and **Dewar** as PGR Lead. CABS is the foundation for all research cutting across the three themes and has the explicit aim of developing research culture through a devolved budget. Initial School investment of £5k in year 1 of the Centre's launch for research activities, including support for data collection, equipment purchase and conference attendance is projected to increase to £30k per annum based on Centre performance. Research is also supported by dedicated administrative support (2.0 FTE) and technical support from a PhD-trained Experimental Officer in Psychology (1.0 FTE) – see Section 3 Facilities. To further support the Centre, SoSS will fund two studentships annually: 1 PhD studentship and 1 Graduate Teaching Assistant. CABS plans to connect research and joint PhD supervision between the UK and the University's campuses in Dubai and Malaysia. There will be at least 20 events within the Centre each year, across CABS three streams of events:

- 1) An External and Internal speaker research seminar series;
- 2) Psychology on Tap (as mentioned above as an opportunity for public engagement training and dissemination); and
- 3) Skills-based sessions in which bespoke psychology methods training is provided on topics such as statistics training or Qualtrics, PschoPy/Pavolviva use for data collection.



**Response to Covid-19**

The Unit recognises the 'new normal' and our plan is to chart our way through the many unknowns. As well as unprecedented socio-economic challenges, this change represents an opportunity and a civic duty. At a strategic-level, Psychology is actively seeking Covid-related research funding, e.g., for keeping the 'human-in-the-loop' as we increasingly move towards a more digitised economy and society; mental health during and post-Covid in children, adults and individuals with developmental conditions; cognitive and mental health interventions for older adults. Further, we will use our well-established public engagement links to provide Covid-specific events. On a practical, data gathering level, the Unit has contingencies to pivot to collecting online data where necessary. More specifically, **Garraffa** is leading BPS-accredited Internet-based experimentation and data-collection training for the Unit in collaboration with the University of Florence.

**Cristea**, **Lansdown** and **Stewart** are part of **CHARIS**: the *Covid Health and Adherence Research in Scotland* project, which is funded by the Chief Scientist Office of the Scottish Government (CSO) via their Rapid Research in Covid-19 Programme. Further, **Stewart** is one of the experts who have shared their expertise with the UK Government in the Horizon Scanning exercise 'Life beyond Covid-19: What are experts concerned about?'

**Grajfoner** and Dr Ke Guek Nee (HWU Malaysia Campus) received an internally funded Global Challenges Research Covid-19 Urgency Grant (£15k) to focus on the effects of the Covid-19 pandemic, specially focussing on the psychological wellbeing of vulnerable groups in Malaysia who are the most likely to experience the highest rates of financial loss and declines in psychological well-being and resilience. **Grajfoner** is also leading a collaborative project with Dr Dusanka Jordan (University of Ljubljana) on the effect of pets on owners' mental health and wellbeing during the Covid-19 pandemic. **Tamariz**, in collaboration with Dr James Stewart (University of Edinburgh) is studying the effects of social network changes during Covid-19 on mental wellbeing. **Gibson** edited a special section of the British Journal of Social Psychology: 'Social Psychological Theory and Research on the Novel Coronavirus Disease (Covid-19) Pandemic'.

The pandemic has been a catalyst for increased digitisation. However, for society to use and benefit from autonomous systems, people need to trust them. In November 2020 a new £3million EPSRC-funded project began: Trustworthy Autonomous systems Node (EN-TRUST), an interdisciplinary collaboration between HWU (**Rajendran** and Professor Helen Hastie, School of Mathematical and Computer Sciences), The University of Manchester (Professor Angelo Cangelosi) and Imperial College London (Professor Yiannis Demiris). This Node is part of the EPSRC's Hub and forms part of the £20.5 million funding for a Hub and Node model to ensure that autonomous systems can be trusted, and ultimately adopted by society. This Node funding has been further supported by SoSS and the School of Mathematical and Computer Sciences through a joint internally-funded PhD studentship.

January 2021 also sees the start of an £182k EPSRC-funded public engagement collaborative project with **Rajendran** and Bridle (School of Engineering and Physical Sciences at HWU). This timely 'Engineering Science Capital' grant will provide fully digitised content to Schools at the very time they have moved to – and requested – greater online content, including possible solutions for Covid.

## 2. People

### Introduction

HWU is committed to ensuring that all academic staff are active at internationally competitive levels in research and/or scholarship. This is supported by our strategic investment Bicentennial Research Leaders fund and through the programme of development and support provided by the Research Futures Academy. One specific example of this commitment was the recruitment of Social Psychologist **Gibson**, to lead the SoSS Doctoral Centre. Recruiting **Gibson** (as the dedicated Director of Doctoral Programmes and Bicentennial Chair in Research Methods) to oversee the training of the PGR population has further reinforced a culture of excellence for both the PGR student and supervisor community.

### Equality and Diversity

In 2020, Heriot-Watt made a successful submission to renew our Athena Swan Bronze Charter Award; this has been conferred until 2026 reinforcing our commitment to extending the principles of facilitating and improving career progress opportunities for female staff throughout all disciplines. As stated in Section 1, progress has already been made in balancing the gender composition of research outputs submitted by the Unit. SoSS has an Equality and Diversity Working Group and Athena SWAN Self-Assessment Team (SAT) who conducted a survey and interviews with staff and PGR students in order to identify a range of issues. One of the Co-Chairs of the SAT, **Tamariz**, sits on the Senior Management Board of the School. SoSS is preparing to apply for an Athena SWAN Bronze award in November 2021. An analysis by the SAT of the survey and interview data has led to the identification of four main priorities in SoSS relating to equality, diversity, and inclusion:

- Engagement with our whole community on issues of diversity and equality
- Increasing gendered representation in key student and staff groups
- Retaining those staff and students that we recruit and
- Supporting progression for them.

These priorities are being addressed through a series of ongoing actions to be all inclusive, compiled in the form of a 4-year action plan in order to support staff and students with a range of characteristics to enter, maintain or progress in work or study. Guidelines and procedures are in place to guarantee that all appointments and promotions are transparently based on quality, ability, and achievement. The SoSS senior management team and the CABS leadership team both have a 50/50 male/female balance. Promotion criteria give consideration to maternity leave, health-related absence and caring responsibilities whilst a mentoring scheme supports female staff considering promotion. Our headcount of 14 is split 9 female and 5 male. SoSS has recognised that there is a need to address this imbalance and in 2019 ran a three-stage programme for female mid-career staff that addressed the issues of (a) establishing research identity and building profile; (b) developing financial skills in preparation for bidding for and managing grants; and (c) building strong networks within and beyond the University. HWU Performance and Development Review (PDR)/Promotion pathways materials feature positive case studies of a wide range of staff, especially women and those working P/T or returning from career breaks. In parallel, at School level, all secondary roles are appointed through a process where all staff have the opportunity to express interest in leadership roles and a transparent workload model has been introduced

## Faculty Staffing Strategy & Staff Recruitment

The Unit's strategy focuses on the recruitment, development, and retention of excellent researchers; we aim to attract the best talent across the discipline to enhance our world-leading research in all areas. Mirroring the commitment to recruiting excellence externally through the Bicentennial Research Leader programme, the UoA has a clear focus on training, developing and mentoring existing staff. Our future staffing strategy also reflects the University's aims in Strategy 2025 to maintain research excellence.

The Unit currently comprises 14 members (13.1 FTE): 11 full time and 3 part-time staff with research in their contract. With a view to the sustainability and development of future research, the staffing strategy over the REF period was to i) make all appointments contractually open-ended and ii) to advertise and align these appointments to the areas of expertise in the UoA. Consequentially, seven new open-ended appointments (six of whom are female) were made: **Cristea**, **Delicato**, **Garraffa**, **Hale**, **McKendrick**, **Sedda**, and **Tamariz**.

## Staff development and support mechanisms

The UoA has had an effective mentoring system in place throughout the assessment period. The annual monitoring of individuals' Performance and Development Reviews (PDR) requires statements of forward job plans focusing on research outcomes and exploring ways of supporting individual researchers to produce world-leading outputs and impact. PDRs are annual and are carried out by the Head of Department or Project PI/Col [in the case of RAs], with input from the Research Centre Director. PDR and other mentoring mechanisms emphasise quality rather than quantity of research outputs, income, knowledge exchange, impact, citizenship and leadership.

Newly appointed staff are supported by a robust mentoring system and more formal training is provided through a Postgraduate Certificate in Learning and Teaching (PGCILT). Midcareer staff are supported by the Research Futures Academy who offer specific training to support them; for example Fast Track PI Training in grant writing and diversification of research for those who have not previously been PIs on a significant grant. For all staff, the Unit has a particular emphasis on developing applied psychologists through facilitating interdisciplinary cross-University collaborations.

We encourage a long-term perspective and submission to well-respected outlets with international reach. During Covid-19 specific focus was given in the PDR cycle to reflect on how the pandemic and the resulting changed working environment has affected different categories of staff members, specific research methods and topics (e.g., data collection in schools) and steps needed to address these issues. For all research staff, there are several support mechanisms which allow them to focus on enhancing their research profile. These include:

- Training sessions aimed at developing pathways to impact in research and sourcing funding for public engagement projects.
- Research community discussions/training at School and University levels carried out monthly.
- Conference, seminar, PDR and Internal Research Grants funding at School level with applications approved by the School's Director of Research (this is now funded through the Centre for Applied Behavioural Sciences).
- Peer review of grant applications before submission to enhance quality of submissions.



## Unit-level environment template (REF5b)

- An active programme of semester-long study leave, accessible every three years and used to reinforce international collaborations. Research sabbaticals have been afforded to **Gow** and **Stewart** during this REF cycle.
- A structured approach to career development, leading to five members of staff promoted during this REF cycle: **Gow** and **Rajendran** to Full Professor, and **Dewar**, **Garraffa** and **Sedda** to Associate Professor.

A Psychology Ethics Committee [under the jurisdiction of the School and University], which is able to provide Psychology-specific oversight in reviewing and approving data collection, and processing and storage after collection; ensuring adherence to the University's and BPS's Ethical Codes while at the same time providing an agile response to local research needs.

### Research Associates

A direct benefit from Psychology's interdisciplinary research is our excellence in developing talented independent thinkers, with uniquely marketable skill sets. We also offer leadership and teaching opportunities to all our Research Associates to develop them still further.

Substantial grant funding has allowed Psychology to employ eleven Research Staff on grants for one or more years (*Bevilacqua*, *Calia*, *Craig*, *Dickson*, *Hoefeijzers*, *McKenna*, *Messer*, *Merhav*, *Niechcial*, *Strickland* and *Vaportzis*). These contracts have allowed the UoA to engage in capacity and capability building of early career researchers in Psychology, with HWU creating a pathway for outstanding researchers to be subsequently appointed to open-ended Assistant Professorships at other UK Universities (one directly to Associate Professor). For example:

*Craig* joined Psychology at HWU as a Postdoctoral Research Associate working in the **Dewar** Memory Lab following completion of his PhD. In 2016, he was awarded an Alzheimer's Society Junior Fellowship. Subsequently, in 2019, he combined his Postdoctoral Research Fellow activities with teaching duties as a part-time Assistant Professor on a research and teaching contract. He was then appointed directly as Associate Professor in Psychology [rather than an Assistant Professor] at a UK University. *Craig* is now an Honorary Research Fellow at HWU until 31st July 2022 in order to maintain his research links with the UoA.

*Vaportzis* was employed as Postdoctoral Research Associate in **Gow's** Ageing Lab on the Tablet for Healthy Ageing project funded by The Dunhill Medical Trust, followed by a 3-year Velux Stiftung-funded project, before moving to an open-ended appointment as Assistant Professor in Psychology at a UK University.

*Dickson* – who worked in **Garraffa's** Language Across the Lifespan Lab – now works at the at The University of Glasgow on the sociolinguistics aspects of acquisition of indigenous languages. His experiences in Psychology at HWU – through presenting data at conferences and workshops – was pivotal for him in gaining this new post.

*Bevilacqua* – who worked with **Hale** for one year investigating associations of cannabis use with mental health outcomes, funded by the Carnegie Trust – is now undertaking a Clinical Doctorate in Psychology in the UK.

## The Doctoral Centre

During the current REF assessment period, SoSS has consolidated its doctoral programmes under the leadership of a newly created dedicated post to oversee all aspects of the doctoral student experience. The new Director of Doctoral Programmes (**Gibson**) is a professorial-level appointment that commenced in December 2019. **Gibson** is responsible for overseeing all aspects of the School's

policies and procedures for postgraduate research students, as well as liaising with key external partners such as the *Scottish Graduate School of Social Sciences* (SGSSS) and the *Scottish Graduate School for Arts and Humanities* (SGSAH). The Director of Doctoral Programmes is supported by a team consisting of four academics and three administrators, as well as by PGR Leads within each of the School's seven Research Centres. A School PGR Committee meets regularly, and consists of all Research Centre PGR Leads, student representatives, and other key colleagues with responsibilities around the doctoral student experience.

Training in key skills and methodologies is provided through two principal routes:

- 1) PhD students have access to a comprehensive programme of generic skills training provided by the University's Research Futures Academy (RFA);
- 2) The School runs a 60-credit PGCert programme in research methods that is compulsory for any doctoral student who does not already possess equivalent Masters level research methods training at the point of admission. Additionally, Psychology PhD students receive Psychology-specific training in Learning and Teaching and are offered teaching opportunities at UG level. This strengthens the teaching-research nexus in the Unit and is important for the holistic development of our PhD students.

The School offers a number of fully-funded PhD scholarships each year, with a total of nine scholarships awarded in the Unit during the current REF assessment period. This represents a total investment of £642k in doctoral research in the Unit. In addition, the Unit has been successful in attracting external funding for PhD students, with three additional scholarships being awarded through external funding.

The recruitment of PhD students is driven primarily by the quality of both the applicant and the research proposal but is also contingent on the level of fit between a proposed doctoral project and the areas of research strength (i.e., the Unit's three research themes) and critical mass represented by the School's Research Centres. Furthermore, our approach is geared towards ensuring that early career academics are given opportunities to develop their supervisory expertise. To this end, it is required that all supervisory teams include at least one member who has experience of supervising a doctoral student to successful completion, and thus when an early career researcher is involved in supervision there is always a more experienced colleague on the team to provide guidance and mentorship.

All PhD students – whether internally or externally funded – have access to an additional budget of £750 per annum for research expenses, such as conference attendance, participant payment and miscellaneous equipment. This budget can be used flexibly across a student's period of study, meaning that unused funds can be carried forward to subsequent years as necessary. High quality supervision is ensured by regular supervisory training provided by the Research Future Academy, and supervision meetings are logged on a central online system that enables any student who appears to be falling behind, and/or not engaging sufficiently, to be easily identified and appropriate follow-up action taken. Formal progress monitoring takes the form of annual review meetings that require the student, supervisor, and a member of academic staff in a cognate area to meet and reflect on progress over the preceding 12 months, with a formal written report forming the basis of the discussion.

During 2020, many PhD students were adversely affected by the restrictions imposed in response to the Covid-19 pandemic. The School and University responded by providing additional support opportunities, such as regular 'virtual coffee breaks' to provide informal opportunities to maintain social contact with fellow doctoral students, and by moving existing face-to-face training opportunities online (e.g., research methods training). In addition, the University took the decision to match the UKRI approach to offering fully-funded extensions of up to six months for final year

students whose work had been affected by the pandemic, with additional support for students in the 1st and 2nd years of their doctorates launched in early 2021.

### **PGR Students**

Over this REF period 8 PhD students (Dimitriou, Douglas, Fallon, Fatkin, Hussien, McKenna, Petrou and Reid) and 1 registered MPhil student (Hunter) have successfully completed. Currently there are 10 Psychology PhD students, including one student awaiting her viva. Six are fully funded by SoSS scholarships, 2 are fully externally funded and one is 50% externally funded [with the other 50% covered by a SoSS fee waiver]. One of these students (Maitland-Warne) is registered on a Joint Degree with Edinburgh University at the Salvesen Mindroom Research Centre for Learning Difficulties.

Many of the Psychology PhD students (both current and present) have second supervisors within the wider School of Social Sciences or University. As previously mentioned, this mechanism highlights the University and School strategy of facilitating and promoting interdisciplinary research. For example, McKenna's second supervisor was Professor Oliver Lemon (a Computer Scientist in the School of Mathematical and Computer Sciences and Director of the Interaction Lab) – primary supervisor **Rajendran**. Lemon is a world leader in Conversational AI, Natural Language Processing, and Machine Learning. Fallon's second supervisor was Professor Ruth Aylett (also a Computer Scientist in the School of Mathematical and Computer Sciences and a specialist in Affective computing) – primary supervisor **Rajendran**. Aylett's seminal research has combined pillars of Psychology like 'Basic Emotions' and 'Theory of Mind' in the context of Graphical Characters and Social Robotics.

Psychology staff also act as second supervisors to students in other parts of HWU, for example, Nioi (in the School of Energy, Geoscience, Infrastructure and Society, funded by EPSRC), with Gow as second supervisor, researched the impact of light exposure on the circadian rhythms of people living with sensory impairments. Sexena (in the School of Engineering and Physical Sciences), is designing a tool to assist patients with aphasia and is industry funded, with **Garraffa** as her second supervisor. As part of the Unit's international research initiatives, **Garraffa** is also second supervisor to Aziz whose PhD is funded by the Malaysian Ministry of Health (See Section 1 for recent funding with Aziz's first primary supervisor, Dr Razak). Macmillan – a former HWU UG student, and now based in the School of Mathematical and Computer Sciences at HWU – is undertaking an EPSRC-funded PhD on online safety in autistic children with **Stewart** as third supervisor.

Additionally, there is joint PhD supervision beyond HWU which again highlights national and international collaboration, and interdisciplinarity. For example, Krzeczowska (University of Strathclyde) is an ongoing joint supervision – with **Gow** as second supervisor; Segovia-Martinez (Universitat Autònoma de Barcelona) has been supervised to completion with **Tamariz** as second supervisor; Jee (University of Edinburgh) is an ongoing joint supervision with **Tamariz** as second supervisor; Bevilacqua (University College London) was supervised jointly with **Hale**.

We actively support the development of our PGR students and some have gone on to pursue academic careers. This is done via their doctoral training, excellence in supervision, and providing them lab demonstration and supervised teaching experience. For example, Fallon and Reid were appointed to open-ended Assistant Professorships at UK Universities. McKenna moved from his PhD to a Post-Doctoral Research Associate position on the EPSRC-funded SoCoRo project in **Rajendran's** Developmental Psychology in Action Lab – and will continue this role on the EPSRC-funded EN-TRUST project.

### 3. Income, infrastructure and facilities

#### Income

As mentioned in Section 1, the Unit has ambitious targets for income generation. Looking back: in the last REF period, staff held 33 competitively awarded grants, which supported a total spend of £632k. In the current REF cycle the spend was £1,639,403 (from 35 awards) which represents a **2.6-fold increase** from REF2014.

The total value of awards that the Unit has been a part of during the current REF cycle is £2.45M (£1.27M from 28 awards – lead only; £1.18M from 7 awards – as collaborators). This highlights Psychology's collaborative and interdisciplinary success. That is in not only gaining funding to Psychology, but also making major contributions to the grant success of others.

The Unit's funders reflect the interdisciplinary and translational nature of Psychology's research – as well as representing a broadening of the portfolio since REF2014, including: The European Commission; EPSRC; The Wellcome Trust; The Alzheimer's Society; Alzheimer's Research UK; Carnegie Trust; Bòrd na Gàidhlig; Velux Stiftung; The Dunhill Medical Trust; The Scottish Government.

#### Internal income support for research

Since joining SoSS, Psychology has benefitted from three fully-funded internal PhD studentships in 2017, two in 2018 and three in 2019. Because of Covid, the next cohort of SoSS funded students will start in January 2021 with the School funding two studentships per annum to the Centre for Applied Behavioural Sciences: 1 fully-funded PhD studentship and 1 Graduate Teaching Assistant PhD studentship (as mentioned in Section 2).

Specific studentship support is also now provided for large grant success like EN-TRUST (See Section 1). Here, EN-TRUST is supported by SoSS with a 50/50 funded PhD studentship between SoSS and the School of Mathematical and Computer Sciences. Wherever possible, large grants within SoSS only are supported with a PhD studentship that is 100% funded by SoSS.

#### Facilities

Psychology has three expertise-specific physical testing spaces: the General lab, the Body and Emotion Lab; the EEG (Electroencephalogram) lab.

Completed in 2017, the General lab occupies an entire top floor (cost £500k). Its generous space includes 13 separate rooms for individual as well as group experiments. There are dedicated separate rooms for a driving simulator and eye tracking equipment. The Body and Emotion lab (**Sedda**) includes a Transcranial Direct-Current Stimulation (tDCS), a Kinematic suite (cameras, a set of force transducers, measuring grip aperture and force) and Functional Near Infrared Spectroscopy (FNRS). The EEG lab has both portable and in situ EEG equipment. Both the Body and Emotion and EEG labs offer easy ground-floor access for children, older adults, disabled and wheelchair users. All the Unit's labs have access to free parking spaces either directly next to labs, or only metres away. Also, an excellent regular local bus service provides a public transport alternative, with bus stops close to all three labs.

The Unit's dedicated PhD-trained (and BPS award winning) Experimental Officer in Psychology (Argyropoulos) manages all labs and also provides support and research development opportunities to staff and students alike.

## Unit-level environment template (REF5b)

In addition to these three dedicated labs, Psychology has excellent access to wider University facilities through our interdisciplinary work. For example, the UoA has access to research facilities for human multimodal interaction research at The Edinburgh Centre for Robotics, including the current and new £22.6 million National Robotarium [funded by the Edinburgh and South-East Scotland City Deal] opening in 2022; the Global Research Innovation and Discovery Centre (GRID) (a £19m centre for technological innovations, with equipment for gamification and VR); the Living Lab (School of Engineering and Physical Sciences); the Virtual Reality Lab (School of Engineering and Physical Sciences) and Language Labs (Languages and Intercultural Studies in SoSS).

Additionally, Psychology will benefit from the Cross Hub collaboration between The National Robotarium and The Edinburgh Futures Institute (The University of Edinburgh) in the following areas:

- *Governance structures*: share practice/expertise on data ethics across the Hubs with a view to influencing wider University practice.
- *Teaching*: bring PhD students together for seminar series [e.g. student-led and contribute to networking].
- *Networking*: sharing of research with a view to creating new research collaborations [seminar series].
- *Public engagement strategies*: series of joint seminars/public engagement events.
- *Research*: broaden capacity in developing and accessing interdisciplinary research projects and programmes.

**Rajendran** contributed to the design which includes six labs that can be configured to be, for example, a hospital bay, a living room, a child/baby lab, etc. The Robotarium will also include a bespoke Living Lab in the form of a flat for assisted living for older people or individuals with a disability. In addition to robots for human robot interaction (including Furhats, ARIs, Tiagos, ICubs, Flashes and PR2s) there will be motion capture equipment, and audio and video sensors for tracking. Next to the Robotarium will be free disabled parking and a minibus spaces – for easy participant access.



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

## Public Engagement

The Psychology 2025 Strategic Plan includes a specific Engagement Strategy. This consolidates a long-standing commitment to engagement which has characterised both the unit and the wider University.

As mentioned in Section 1, Psychology staff regularly participate in the Edinburgh Fringe Festival, as well as making local, national and international media appearances.

The Cabaret of Dangerous Ideas (CODI) at the Edinburgh Fringe Festival has been one of many avenues that the Unit has used to take research to the general public. CODI is an innovative and highly successful co-produced public engagement with research programme – and is a collaborative effort between the four universities in Edinburgh (coordinated through the Beltane Public Engagement Network). CODI takes public engagement to the world's largest arts festival: The Edinburgh Festival Fringe. **Gow**, **Rajendran** and **Sedda** regularly performed shows to share their research and have performed to over 600 people from 2014 to date. Similar outreach activities, such as Pint of Science, have included contributions from **Gow** and **Stewart**.

Media exposure includes **Rajendran's** appearance on the world's longest running Children's TV show, Blue Peter: The robots are coming! episode in 2017. Here, Rajendran appeared alongside Flash, Pepper and Miro robots and explained to a younger audience about how socially assistive robots would be impacting our future lives. Gow has appeared on the BBC's flagship science programme, Horizon as an independent contributor to their recent programme about intelligence; specifically, Gow provided commentary on the wider field of cognitive ageing and the lifestyle factors that might promote brain health, in addition to previous appearance on BBC Radio 4 and BBC Radio Scotland's Brainwaves.

Psychology staff also regularly present and have interactive exhibits at Science Festivals, for example **Cristea** presented work about pro-sociality and sharing behaviours among children at the Edinburgh International Science Festival ('Science Night at the Zoo', April 2016). **Rajendran** and Computer Science colleagues from the SoCoRo project had an interactive robot exhibition at the Edinburgh International Science Festival (April, 2019). In 2016, **Gow** was an invited presenter at the British Science Festival held in Swansea. In 2019, **McKendrick** was invited to present 'The novice to expert viewpoint' as a guest speaker at the CodeYourFuture (CYF) Conference, June 28th, University of Glasgow. CYF is a UK based non-profit organisation that trains refugees and other disadvantaged people to become web developers and helps them to find work in the tech industry.

Psychology has a substantive and sustained presence in non-peer reviewed, digital and print media. For example, six articles were published in The Conversation and available via that outlet's creative commons during the REF period. These include "When it comes to keeping our brains young, we need to rise to new challenges"; "How robots can help us embrace a more human view of disability"; "New hope for people obsessed with amputating one of their own limbs" – through **Gow**, **Rajendran** and **Sedda** respectively – with a 135,000+ combined reads from The Conversation site directly. These articles were subsequently picked up by other media, including the Huffington Post, The Daily Mail, The i and The Independent –further increasing their reach. **McKendrick** was invited to write an article supporting the First Minister for Scotland's Advisory Council on Women and Girls, an independent body set up to tackle gender inequality which was then picked up by The Scotsman.

## Keynote Addresses and TEDx talks

**Gibson** gave a keynote at the joint conference of the BPS's Qualitative Methods in Psychology Section and History & Philosophy of Psychology Section (Cardiff, July 2019). **Rajendran** gave a Keynote at the Video Games Conference organised by the University of the United Arab Emirates (Al Ain, UAE, April, 2015). **Grajfoner** gave the opening keynote at the European Coaching Psychology Conference (London, December, 2015). **Tamariz** gave Keynotes at Triggers of Language Change international conference. Université Lyon II, Lyon, France, 12 October 2017; "Minds, Mechanisms and Interaction in the Evolution of Language" international workshop. MPI Psycholinguistics, Nijmegen, The Netherlands, 21 September, 2017; the international conference "Why Linguistics" international conference. Tartu, Estonia, 7 May 2015. **Rajendran** and **Stewart** both gave TEDx talks in 2016 about social robots and autism and integration across the autism spectrum respectively.

## Stakeholder Engagement:

Our stakeholders not only often fund and participate in research, but Psychology actively disseminates findings to them. For example, both **Stewart** and **Rajendran** work in partnership with Autism Initiatives, which is a local and national charity committed to finding and maintaining employment for people on the autism spectrum. **Rajendran** also works with All in Edinburgh, which is a local charity whose aim is to find and keep in employment people who have a disability or long-term health condition. **Cristea** and **Stewart** led training events for LAYC (a charity supporting community-based youth and children's work in Edinburgh and the Lothians) about imposter syndrome and autism respectively. Craig was funded by the Alzheimer's Society through a Junior Fellowship, which also enabled him to disseminate his work on dementia through them. Moreover, Craig has worked with Alzheimer Scotland to coordinate and deliver a series of informal research talks at Alzheimer Scotland 'dementia cafes' in Edinburgh. This relationship is now maintained by **Dewar**. Representatives of Age Scotland, Age UK, Education Scotland, NHS Lothian, and the Scottish Older People's Assembly sit on **Gow's** study advisory panel. He has also contributed to workshops or web materials for Age Scotland and Age UK and is a member of the Scottish Parliament's Cross-Party Group for Age, Ageing and Older People. **McKendrick** has engaged with clinicians and patients interested in medical technologies and education – as an invited speaker at the Edinburgh Anaesthesia Festival (EAF), 19-21 August 2020 (now 2021) at the 'Royal College of Physicians, Edinburgh, (RCPE)' and guest speaker at the Dundee Institute for Healthcare Simulation (DIHS) launch, 19th Sept, 2018 and the British Orthopaedic Association Congress, Sep 21st, 2017 Liverpool. In June, 2018, **McKendrick** hosted an EPSRC Impact Acceleration Account-funded Medical Training Innovation Hub and Workshop (funded for £11k), bringing clinicians, SMEs and cross discipline academics together at a national level. **McKendrick** works with Venture Trust who support young people (aged 16-24) who have a history of disadvantage and are at risk of (re)offending or of anti-social behaviour. **Hale** has joint projects with National Children's Bureau and has affiliations with the Scottish Drugs Forum to engage stakeholders.

## International Networks and collaboration

The Unit's international reputation has been enhanced through international collaborations. For example, **Garraffa** has hosted several visiting scholars over the REF period including: Professor Davide Crepaldi, Associate Professor from SISSA and Head of the Cognitive Neuroscience PhD program, Dr Giuditta Smith PhD candidate in Cognitive Psychology at University of Trento, Dr Franziska Koler Lab Director of the Center for Multilingualism in Society across the Lifespan Faculty

## Unit-level environment template (REF5b)

of Humanities, Oslo University and Dr Paolo Canal from IUSS PAVIA an international expert in EEG and eye tracking methods for the study of language. A team composed of **McKendrick**, Dr Ozge Akbulut of Sabanci University, Istanbul, and Dr Sue Down of the University of East Anglia has been shortlisted for the Newton Fund's prestigious Sustainable Development Goals Chair's Prize to deliver a hands-on online platform to offer high quality and accessible oncoplasty education to surgeons in ODA countries. **Gow's** recent 3-year intervention study included an international expert advisory panel, comprising Professor Kaarin Anstey, Australian National University; Professor Ian Deary, University of Edinburgh; Professor Mike Martin and Dr Christina Roecke, University of Zurich; Professor Kaisu Pitkälä, University of Helsinki.

## Journal Editorial Board Memberships.

**Gibson** is the Joint Editor-in-Chief of the British Journal of Social Psychology; **Cristea** is the Senior Editor, Europe's Journal of Psychology; **McKendrick** is an Editorial Member of PLOS ONE; **Grajfoner** is Member of Editorial Board of the Coaching Psychologist, and the International Coaching Psychology Review, **Dewar** is Member of Editorial Board for the Journal of Cognition; **Gow** is an Editorial Board Member for Gerontology. **Garraffa** is an Editorial board member of the Journal of Clinical and Linguistic Phonetics and Frontiers and Language Sciences. **Tamariz** is a member of the Advisory Board and Associate Editor of the journals Cognitive Semiotics and Language Evolution

## Awards

Both Psychology staff and undergraduate students have won distinguished awards during the REF period. Argyropoulos was the winner of the British Psychological Society's research/technical support award (2016). Both **Gow** and Craig won HWU Prime Awards for Public Engagement in 2019; winning the Pioneer and Changemaker awards respectively. **Gow** was one of two runners-up in the Nature Research Award for Driving Global Impact (2019) and won the British Psychological Society Public Engagement and Media Award (2016); **Dewar** was the winner of the British Neuropsychological Society's Elizabeth Warrington Prize (2016). Hastie won the UG Dissertation Award for the British Neuropsychological Society (2016). Craig was awarded an Alzheimer's Society Undergraduate Research Bursary grant for an UG student to work with him as an RA over the summer of 2018.

## Review and evaluation activities

The expertise of UoA's staff is much sought after in both Psychology and interdisciplinary research. Unit members have reviewed for research institutions including ESRC, EPSRC, MRC, BBSRC, EU, Chief Scientist's Office for the Scotland Government, Italian Ministry of Health, Netherlands Organization for Scientific Research - Council for the Humanities (NWO), The Romanian Ministry of Education and Scientific Research, Alzheimer's Society and Carnegie Trust for Scottish Universities.