

Institution: Anglia Ruskin University

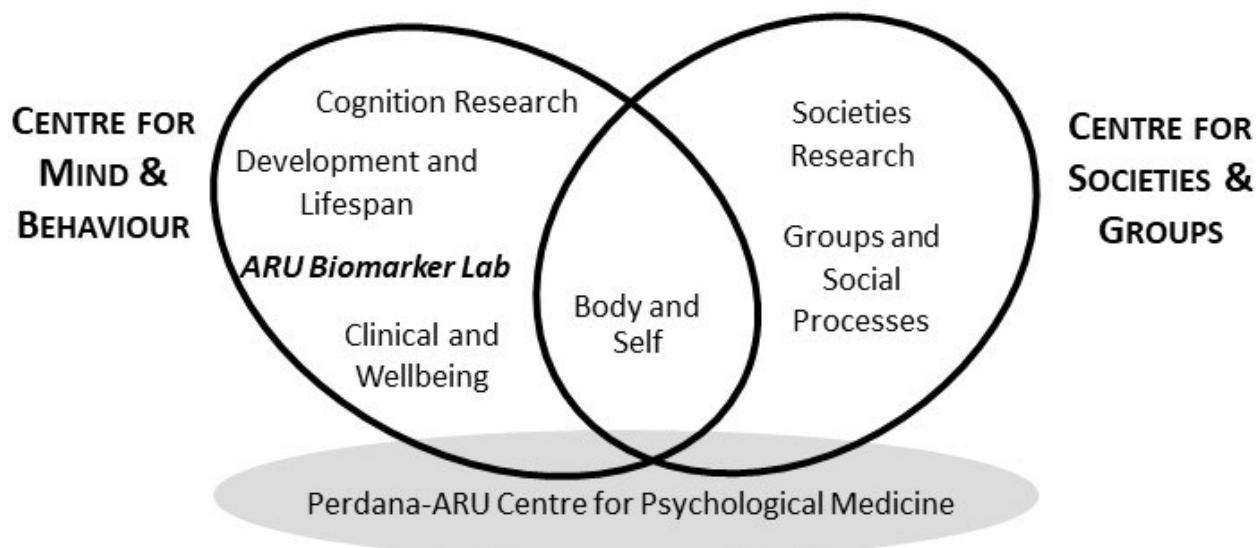
Unit of Assessment: 4

1. Unit context and structure, research, and impact strategy

As an ambitious unit, Psychology at ARU has expanded and developed in terms of staffing, environment, impact, and research over the last REF period. We have grown from 17 academic staff, of whom 9 were ECR, to 32 staff, of whom 4 are ECR, benefited from over £45m of institutional investment in research infrastructure, and increased research funding from £222,233 in REF2014 to £797,671 in REF2021. We are now a leading centre of development research, with major strengths in body illusions and body image, as well as cognition in clinical populations. Our five-year plan is to consolidate our standing as a leading unit of cognition, clinical, developmental groups and body image research; significantly increase grant capture; leverage existing international connections to enhance the reputations of our Research Centres; diversify links with non-academic partners and policy makers; and support our researchers in the delivery of high-quality and original empirical work.

From 2014 to 2018, the unit consisted of staff working in the Department of Psychology, situated in the Faculty of Science and Technology. Following a university-wide restructuring in October 2018, the Departments of Psychology, Sport & Exercise Science, and Vision & Hearing Sciences were partnered together in one School. This change capitalised on existing collaborations (e.g., Keyes & Timmis [UoA24]), supports overlapping research methods and interests, and facilitates cross-disciplinary research. The unit is now part of the School of Psychology and Sport Science, alongside Sport and Exercise Science (UoA24) and Vision and Hearing Science (part of UoA3), in the Faculty of Science and Engineering.

Research Centres and Interest Groups



Research in the unit is structured around two centres, providing all researchers with discipline-appropriate leadership and an active research community. Staff work together in smaller research interest groups, situated both within and across Research Centres, reflecting our collegiate research community and providing opportunities for research leadership and development within the Research Centres. Alongside unit Research Centre affiliation, a subset of researchers from

both (e.g., Swami, Cardini, Aspell) contribute to a cross-HEI collaboration with Perdana University, Malaysia: the PU-ARU Centre for Psychological Medicine.

The Centre for Mind and Behaviour (CMB), formerly the Brain and Cognition group, was a significant part of the unit's REF2014 submission, and half of the centre's current staff were included in that exercise. It has established itself as an internationally recognised centre in cognition and developmental sciences, and undertakes research aligned with the ARU priority research areas of *Ageing* and *Sustainable Healthcare*. The centre is led by Professor Peter Bright and is comprised of 4 Readers, 2 Principal Lecturers, 12 Senior Lecturers, 18 doctoral students and a post-doctoral research associate. Over the current REF period, the CMB has consistently produced outputs in Q1 journals, including Brain and PNAS; highlights include:

- *Cognition* with outputs in intelligence measurement (Bright) and bilingualism (Bright), with income for research (Leverhulme £168,951 to Bright/Filippi) and KTPs (Innovate UK to Pearson/Ringway Jacobs).
- *Development and Lifespan* with outputs in dyslexia and poor readers (Kuppen), mother-infant touch (Kirk), memory in children (Ford), attachment in adolescence (Stagg), and emotional validation (Lambie). The group has secured income (e.g., Action Medical Research £52,187 Ford; British Academy £10,000 D'Souza; the Bedford Charity £16,893 Kuppen) and is generating impact through the design of toys with Skylark (See ICS1).
- *Clinical and Wellbeing* with outputs on the experience of mental ill-health, such as obsessive and compulsive behaviour (Morein-Zamir), and experiences of Attention Deficit Hyperactivity Disorder (Morein-Zamir) and psychosis (Vasconcelos e Sa). The group also includes expertise on measuring biomarkers, such as cortisol, in saliva and hair (Bristow), which is generating impact (ICS3) and a KTP (Innovate UK to Forwood/Bristow/England Marketing).

The Centre for Society and Groups (CSG) represents a more recent growth area for the unit and has benefited from the unit's strategy to recruit research-active staff: both a Professor (Swami; appointed 2015) and Principal Lecturer (Boniwell; appointed 2017) bring expertise in social and positive psychology to the unit. The centre is comprised of 1 Professor, 2 Readers, 4 Principal Lecturers, 3 Senior Lecturers, and 5 doctoral students and contributes to the ARU priority research themes of *Social inclusion and marginalised communities*; *Built environment and future cities*; *Crime and policing*; and *Sustainability and development*. The CSG has seen an increasing proportion of outputs appear in Q1 journals such as Personality & Individual Differences and the British Journal of Social Psychology; highlights include:

- *Groups and Social research* with outputs addressing language use in conflict situations (Finlay), coercion in mental health (Kaminskiy), and masculinities and ethnicity (Swami). Researchers have secured income (LGBT consortium £16,500 McDermott), are the UK lead-partner for the International Partnership for Queer Youth Resilience (INQYR, overall CA\$2.5m 2018-25) and are part of the PU-ARU centre for Psychological Medicine (cross-HEI collaboration).
- *Societies research* with outputs in areas such as victim-blaming and deserved outcomes (Harvey), gender stereotypes in advertising (Zawisza), visual processing while driving (Keyes), and interventions promoting resilience in schools (Boniwell). The research is securing income (British Academy – Zawisza/Keyes; Centre for Better Ageing - Forwood; Cambridge City Council - Keyes), and generating impact (See ICS2).

Body and Self researchers work across the two Research Centres have produced outputs on full-body illusions (Aspell), out-of-body illusions (Aspell), bodily representation (Cardini), and body image (Swami). This group has secured income (BIAL £30,313 Aspell; British Academy £19,533 Aspell/Cardini), and in October 2020 started a 3-year £190,344 project for Versus Arthritis (Aspell/Cardini).

The PU-ARU Centre for Psychological Medicine (funded by Perdana University, income of £125,267 in the current REF cycle) is a transnational centre between ARU and Perdana University (Malaysia). This Centre was formed in 2017 to provide the infrastructure needed to support cross-cultural research – a critical mass of researchers working collaboratively in two cultural contexts: the centre is directed by Swami with 0.2FTE of his time dedicated to this and includes both ARU (N=2) and Perdana researchers (N=4). ARU researchers include a professor (Swami), and a PhD candidate (Todd), while PU-based researchers include a Reader, an ECR, and two Research Assistants (not eligible for inclusion in the REF cycle). Since 2017, the Centre for Psychological Medicine has emerged as an important hub of internationally excellent research focused on cross-cultural issues in body image and emerging research in schizotypy. The Centre's research portfolio includes leading large-scale international projects (e.g., the Breast Size Satisfaction Survey, with collaborators in 40 countries) and regional collaborator networks (e.g., the Asia-Pacific Schizotypy Network), long- and short-term projects on the psychometric measurement of body image constructs in different social identity and cultural groups, and multidisciplinary (psychometric, genetic, cognitive) studies on translational aspects of schizotypy.

Review of Research Strategy from REF2014

REF2014 Objective 1. *To maintain and enhance a research environment that promotes and enables world-class research:*

- a. *Create specialist research interest groups within the overarching research groups to further support collaborative research activity and income-generation activity, as well as fostering our research assistants and research students.*
- b. *Equip and support state-of-the-art research laboratories.*
- c. *Further invest in research support staff (pre- and post-doctoral research assistants, graduate teaching assistants, and technicians) to support academic activity.*
- d. *Increase number and success rate of research funding applications.*

During the assessment period, the Psychology Research Strategy Committee, led by a professorial appointment (Swami), oversaw research strategy in the unit through strategic leadership. They undertook an internal review, and led on implementing and reviewing the REF2014 objectives, alongside the ARU 2014-17 and 2018-22 Research and Innovation Strategies. The current structure of research in the unit, including Research Centres and interest groups, arose from this leadership, creating a cohesive research environment benefiting staff and associated students, assistants, and collaborators. In 2017, all unit staff were moved the £45m Science Centre (see **Section 3: Income, infrastructure and facilities**), benefiting from extensive investments in equipment and laboratories. Further investment in research capacity and success in funding is detailed below.

REF2014 Objective 2. *Participate fully in the international psychology research community and build upon existing collaborations to increase research capacity:*

- a. *Facilitate collaboration through directed Department funding.*

- b. Facilitate income generation through provision of dedicated time for staff to focus on this activity.*

Investment in research collaboration and participation in the international psychology research community is provided for all staff in the unit through activities designed to increase research capacity. Since 2014, the unit has run an internal peer-review scheme for staff sabbatical applications and grant applications, which has resulted in successes via the competitive peer-reviewed university sabbatical scheme (20 x 6-month sabbaticals awarded to unit staff in the assessment period). Unit staff are encouraged to apply for annual summer studentships, where undergraduate students can take up paid research assistant opportunities with staff supported by QR funding, and from 2014-2019 by bi-annual writing retreats, where staff are accommodated off-campus to support research focussed writing. Further QR funding schemes offer support for staff to attend national and international conferences. Over the REF assessment period, 25 staff have had at least one summer studentship and 18 staff have had at least one writing retreat, with most staff making repeated use of these sources of support.

Delivery of Objectives 1 and 2 has resulted in a wholesale transformation of the research community and activities in the unit. Firstly, there has been substantially increased investment in staff, increasing the number of staff returned to the REF from 16.7FTE (3 of whom were returned to UoA22 in 2014) to 28.8FTE (all of whom are being returned in UoA4). More crucially, our staff portfolio now includes more diverse research specialisms (cognitive, developmental, social, and clinical and health, respectively, each contributing 15% of submitted outputs) and career stages (2 Professors, 6 Readers, 6 Principal Lecturers, 15 Senior lecturers, and 2 Lecturers). Secondly, we have demonstrably increased the number of research outputs from which research impacts and wider contributions accrue. Staff in the unit published 216 peer-reviewed publications, 20 book chapters, and 7 edited or authored books, leading to an average of 7.53 publications per FTE over the past 5 years in comparison to 2.83 per FTE submitted to REF2014. Thirdly, we have substantially increased the value of grants applied for and awarded over the period, resulting in increased income from £222,233 in REF2014 to £797,672 in the current cycle (from £13,307 per FTE to £27,696 per FTE).

REF2014 Objective 3. *Recruit researchers capable of world class research and invest in their development:*

- a. Maintain recruitment of staff with strong record of research and high potential for significant impact, including professorial appointments.*
- b. Develop current staff via the promotions process to enhance capacity for academic leadership within the department.*

Following REF2014, our internal review identified a high proportion of ECRs in the unit and the potential for high turnover of ECR as threats to long-term research sustainability. This resulted in the implementation of a multi-pronged, time-staggered strategy aimed at both recruiting researchers capable of world-class research and promoting a better balance in terms of seniority while retaining and supporting career progression for our existing ECRs and researchers. The period since REF2014 has been one of exceptional growth for the unit, with between 2 and 11 new staff joining the unit every year. All recruitments during this period sought to find staff with a strong record of research. Furthermore, in addition to the strategic appointments in CSG cited above, appointments were made at senior levels, including a Reader (Pearson) and a Professor

(Swami), and areas of research expertise were considered with a view to ensuring leadership and experience within the unit's centres.

Over the same period, career and research mentoring and financial supports were established for internal promotions to mid-career (Ashworth, Cardini, Forwood, Harvey, Keyes, Kuppen, Piech, Richardson) and senior posts (Ford, Forwood, Harvey, Janssen-Boyd, Keyes, Lambie, McDermott, Zawisza). Support within the unit for promotion included access to conferences, research skills training, sabbaticals, summer studentships and writing retreats, as set out above, alongside individual mentoring for completing the promotion process. Support from the institution includes provision of a clear and structured promotions process, with associated training delivered by the DVC (Research & Innovation). Further details are set out in **Section 2: People**.

REF2014 Objective 4. *Develop increased capacity for public engagement, knowledge transfer, and other impact from research:*

- a. *Ensure that public engagement and impact are considered as part of annual plans for review of research and scholarly activity.*
- b. *Provide directed support at department (as well as faculty and University) level for public engagement and knowledge transfer activities.*

The unit has paid close attention to the issue of partnership activity and impact – particularly as the REF2014 panel highlighted the need to support research with emerging impact – and has developed a comprehensive, long-term strategy to support impact-focused research and activities. The unit identified potential Impact Case Studies (Bristow, Lambie, Kuppen, Swami) early in the REF2021 cycle and in 2017 made a strategic senior appointment (Boniwell) from which new strands of impact were fully developed within the current REF period (see ICS 2). All potential case studies were supported and developed by institution-level activities throughout the assessment period, including workshops with RAND Europe. This support generated overt planning of pathways to impact for each potential Impact Case Study, with clear goals and metrics. Alongside this, guaranteed packages of £5,000 per annum of Psychology QR funding was allocated to support advanced Impact Case Studies. In parallel with this support, competitive packages of £2,000 were made available to support and develop emerging impact elsewhere in the unit. This strategy has led to substantive gains: in REF2014 the unit was reliant on the two case studies, whereas for REF2021 we supported development of a range of potential case studies, submitted our three strongest ICS and are fostering additional emerging case studies for the next REF cycle.

Direct support for partnership development, public engagement, and knowledge transfer activities have been implemented through both institution-level and unit-level initiatives (e.g., RIDO Partnership Development Managers, hosting of Outreach events, recognition in staff workloads and appraisals). Time spent on public engagement or with external partners that would lead to knowledge transfer activities is explicitly recognised in staff appraisals and with up to 10% of time in staff workloads. Fostering these relationships is viewed by School leadership as an important opportunity for both income and impact-generation and represents one level at which we grow relationships with local and regional communities to innovate and apply our research. Furthermore, staff are signposted to training events and administrative support provided by the Research and Innovation Development Office (RIDO) and university Press Office. These activities have led to a significant increase in the types of partnerships secured, which include commercial consultancy (e.g., Unilever & Skanska), public sector consultancy (e.g., Cambridge County

Council), KTPs (e.g., Ringway Jacobs), and Innovate Bridge projects (e.g., Stemnovate). They have also led to growth in the range and number of collaborations, media appearances, and dissemination activities, all of which are pathways to impact (see **Section 4: Collaboration and contribution to the research base, economy, and society**).

Research Culture and Integrity

The culture of research within the unit is fostered through annual research away days, and a culture of open methods, collaborations, and support. Opportunities for funding and support are shared with staff through monthly staff meetings and internal peer-review schemes for sabbatical and VC PhD studentship applications build a sense of research as a shared unit activity. Staff are signposted to institution-wide sources of further support, and many unit staff are leading in the implementation of good research practice (e.g. Zawisza, Morein-Zamir).

All research in the unit is conducted to the standards set by institutional, professional, and legal requirements. Compliance with standards set out by the British Psychological Society happens at two levels, each complying with institutional procedures for ethical research overseen by the university Research Ethics Committee and the ARU Research Ethics and Integrity Manager. The unit runs an online process for low-risk research with human participants submitted to the School Research Ethics Panel (chair Kaminskiy) and staffed entirely by unit staff, while higher-risk research is reviewed by the Faculty Research Ethics Panel (chair Bright), on which unit staff are members. Unit staff also lead on institutional compliance with the Human Tissue Authority Licencing (Bristow), Health and Safety compliance with RoSPA (Bristow), and chair the Faculty Health and Safety Committee (Bristow). As per institutional requirements, all staff are trained on data protection and GDPR, and receive support and training from the university Information Compliance Manager.

All staff are required to submit publications to ARRO, the institutional repository, and a unit lead (Bright) drives engagement with open research practices through training to unit staff. Staff have benefitted from the ARU Open Access fund, with 13 staff requesting support for 19 papers and £27,220.47 spent. All staff have Symplectic accounts (to monitor research outputs) and the recent introduction of Figshare (for open data) is also gaining usage, and 68% staff have linked ORCID identifiers. Beyond these, a growing number of staff are active users of Open Science Framework to share projects and data. Open and reproducible research practices are seeing huge growth in the psychology research community, an area we seek to grow in the unit in the coming assessment period (see REF2021 Objective 2).

Research Strategy over the next REF period

As the unit is part of the School of Psychology and Sport Science, including staff submitted to UoAs 3, 4 and 24, strategic leadership for research across the School's disciplines are overseen by the School Research Strategy Committee. Objectives were set in line with School strategy and complimenting those of other UoAs to support income generation and recruitment of research students, while also enhancing the profiles of staff and Research Centres and promoting research under the three key recently established ARU research themes: *Health, performance, and wellbeing*; *Sustainable futures*; and *Safe and inclusive communities*. Research Centre activities are reviewed by the School Research Strategy Committee through quarterly meetings, supported through dedicated QR funding, and plans of action reviewed annually at the end of the financial year (i.e., July).

REF2021 Objective 1: Developing Research Centre Profiles

We will promote the external facing reputation of our Research Centres and staff, to attract new staff, collaborators, research students and income. Specific actions include:

- A.** Recruitment of new staff to *reflect the needs of Research Centres*, maintaining a balance of senior-to-junior staff within each centre and meeting strategic objectives around expertise and skills.
- B.** Research centres will deliver *activities to raise the profile of the Centres* to an audience external to the institution, to include interdisciplinary (e.g., running a skills-development workshop), cross HEI (e.g., shared use of research facilities or resources), international (e.g., hosting a research conference), or partnership generating activities (e.g., a networking event for local partners).
- C.** Staff will be supported to create *quick-reference profiles of Research Centres and research groups*, detailing methods, facilities, experience available to build interdisciplinary collaborations, inter-institution research teams, and external partnership opportunities.

REF2021 Objective 2: Focus on Output Quality

We will boost the number of internationally leading, high-quality (i.e., 3-4*) outputs for the next REF cycle through initiatives that explicitly promote collaborative research and rigorous practices. Actions include:

- A.** Promoting interdisciplinary research collaborations through *collaborative research initiatives*, to include sandpit and idea-generation workshops with support from RIDO; multidisciplinary supervisory teams for PhD and summer placement projects; rewards for interdisciplinary and international teams on publications.
- B.** Promoting open research environment practices through academic leadership: *School Open Research and Integrity Lead*. Appointed following an open call to all staff, Morein-Zamir will raise awareness of reproducibility in research, training opportunities, and relevant external organisations (e.g., UKRN, OSF, SIPS, Psychological Science Accelerator); will increase use of study pre-registration, data repositories that support open data, participation in international consortia for multi-lab research projects, in addition to continued existing best-practice in the use of open access publishing; will work with colleagues in promoting Research Integrity in ARU.

REF2021 Objective 3: Sustainable support of External Partnerships and Impact

We will expand activities with non-academic partners and collaborations with stakeholders, income from partnerships, opportunities for applied research and impact generation. Actions include:

- A.** Promoting external partnerships and consultancy through academic leadership: *School Partnership Development Lead*. Appointed following an open call, Zawisza will work within the unit to audit existing partnerships and support new partnerships; and work with the institution Business Partners (RIDO) and Research Centre Directors to identify potential large-scale and long-term partner organisations.
- B.** Staff will be coached by their research mentors and line managers to complete a *Research Impact Escalator*: a structured decision tree for early identification and refinement of the research outcomes and pathways to impact at both project inception and reporting stages. This will implement guidance from ARU RIDO and established methods used in the charity sector to generate impact and Theory of Change (e.g., NCVO, Think NPC), and be used to establish flagship partners for Research Centres.

2. People

The community of psychology researchers at ARU are an energetic and committed team. Their research underpins the unit's success over the assessment period, and continued investment in and recognition of our people is both the institution's and the unit's strategy for sustaining a thriving research community.

Staffing strategy and staff development

This unit is currently composed of 32 staff, of whom 62% are women, 13% are under 35, and 13% BME. Fixed-term contracts (currently one) are used exclusively to cover leave (maternity, sabbatical).

The unit takes a strategic approach to align **recruitment** with unit needs, and considers research area, career path, and fit with the current staff interests (See **Section 1**). In accordance with institutional procedure, roles are advertised with person specifications and job descriptions, and all roles in the unit have research as part of the essential requirements (PhD, publications, scope for collaboration and income). During the interview process, applicants present their research to unit staff, who feedback to the interview panel.

Staff offices (2-3 people sharing) are in the new Science Centre (see **Section 3**), close to research laboratories and with IT and software to support research. Staff **line managers** are appointed from the senior management team of the school, all of whom are active researchers. Senior management receive training, including in management, coaching skills, and wellbeing and mental health. Line managers have a maximum of 15 staff, meaning they can invest in their staff, get to know research profiles and personal circumstances, and can provide effective support. Research Centre Directors work with staff to allocate them to the **Research Centres** and research interest groups that best matches their research (See **Section 1**).

All staff are required to complete mandatory **training** in ethics, GDPR, and risk assessment. Further training is also available for research equipment and software, such as Qualtrics, Labvanced, and Gorilla (provided by the Psychology Technicians), grant writing, peer review (provided by RIDO), and research skills, such as strategic career planning, communicating science and project management (provided by the ARU Staff Researcher Development Programme, which mirrors the Vitae Researcher Development Framework).

Mentoring is available to all staff. New staff are provided with a probation mentor for their first 18 months as a source of support and to integrate new staff in the unit's community and social life. Existing staff have access to a research mentor (max 3 per mentor) through a school scheme, coordinated by Lambie, with staff needs determining the duration and expertise of the mentor.

Workload allocation in the unit takes place each spring for the following academic year, coordinated with the appraisal calendar. This timeline allows staff to prepare personal research plans for the coming year and beyond, discuss this with their line manager, and have agreed goals for the coming year reflected in the workload allocation of teaching, administrative and research credits. Similarly, staff and their line manager discuss **promotion** and relevant goals are included in the personal research plan, with support for promotion offered both by the unit and the institution (See Section 1). Personal research plans for staff are seen by the unit as an important stage in supporting staff development – a place where their broader research ambitions can be discussed and implemented for the coming year. In **annual appraisal** meetings, the previous year's goals are reviewed and completion of them forms a basis for deciding whether staff are awarded 0, 200,

500 or 800 credits for research in the following year, according to the Academic Workload Balance Model set by HR, and hence are considered to hold *Significant Responsibility for Research* (SRR) as defined by the institutional Code of Practice.

Early Career Researchers in the unit (D'Souza, Sa, Sadek, Sakkalou) benefit from both unit and institutional initiatives to ensure they get the support needed at the start of their research careers. The unit offers ECRs 500 credits for research in at least one of their first two years of employment, and funds to support research in line with the expectations of the ECR charter. At the School level, an ECR peer-support network meets regularly, with ECR representation on the School Research Strategy Group and the Postgraduate Research Student Management Group.

Social and wellbeing promotion events are supported by the unit through off-campus away-days to discuss research in the school, and informal social events led by the unit social lead (Goodings), such as social activities after work, bowling, and weekend picnics. Institution support for staff wellbeing includes on-campus activities for staff and a Wellbeing Group reviewing actions in this area (Butler and HR).

Former unit staff are in senior or research roles, including Heads of School (Prof Luyt, Greenwich; Dr Hills, Bournemouth), Professors (Prof Stevenson, NTU), Associate Professor (Dr Filippi, UCL), Sir Henry Dale Research Fellow (Dr Clarke, U Cambridge), and Senior Fellow in Health Policy (Dr Paddison, Nuffield Trust). This shows the strength of the unit's staff development and support: it has been effective in supporting both internal promotion (see Section 1) and external promotion to senior positions and prestigious external organisations.

Research students

Improving the experience, number, and successful completion of research students within the unit was a key focus throughout the assessment period (REF2014 Objective 3), and it has been successful, resulting in 26 PhD candidates beginning programmes within the Unit in the last REF period (an increase of 160% compared to REF2014) and 14 completions during the last REF period (an increase of 600% compared to REF2014). Overall, the unit is now a more attractive and supportive destination for PhD candidates, offering a structured, cooperative, and engaging working environment to foster independent research careers. Several PhD completions from the unit have secured research roles in world-leading institutions: Dr Ellen Carroll (Bright), research assistant/associate Cambridge; Dr Julia Ouzia (Bright), teaching fellow KCL; Dr Sam Martin (McDermott), post doc Oxford; Dr Anja Lindberg (Lambie), research assistant Cambridge; Dr Laura Jones (Bright), post doc UCL.

The steady and sustained support of research students during the assessment period has been achieved through the strategic appointment of a Director of Postgraduate Research for the School (Aspell). They check applications, review proposed supervisory teams, ensure student projects align with staff and Research Centre expertise and advise students and supervisors in the unit on sources of support throughout their studies. The Director also sits on the School Research Strategy Group, contributing to the strategic management of research in the unit. The Director works closely with the ARU Doctoral School, providing institutional support and training for supervisors and research students. Student progress is monitored by the Doctoral School through a timeline including training, annual reviews, and upgrades, and supported by the Director who drives timely completions.

The post-REF2014 review of the unit Research Centres and the 2017 move to the £45m Science Centre has also allowed improved integration of research students into the unit research community: students are now affiliated to a group of researchers within one of the Research Centres, participate in regular research seminars and take on roles within those groups, with offices, labs and meetings spaces in the heart of the unit research environment (see **Section 3: Income, infrastructure and facilities**). This centralised space has facilitated better working practices and relationships between research students and academic staff. A reflection of the impact of this has been the inclusion of 5 research students as co-authors in the current REF cycle (36% of students), compared with none in REF2014.

The unit has encouraged and supported staff applications for university-wide PhD funds, including prestigious Vice-Chancellor Studentships. The unit also runs an internal, dedicated unit funding scheme that prioritises support for PhD candidate training and conference travel (£10,577 spent in the last REF period), a scheme which has since expanded to the faculty.

Throughout the assessment period, doctoral students attend research seminars and conferences to network with the international research community and share their expertise. The growth in our research student community has also led to opportunities to gain leadership and organisation skills. The first School PhD conference in April 2019 was organised and chaired entirely by unit doctoral students with help from the Director of Postgraduate Research (Aspell). Unit doctoral students have also organised writing retreats for research students (Roeloffs), including student-taught presentations on research methodologies, warm-up exercises for writing, and talks on managing stress and conflict. This scheme has since been rolled out by the Doctoral School for the benefit of students across the institution.

Equality and diversity

Promoting equality and diversity is part of the ethos of the unit, which prides itself on being inclusive. This is evidenced in many ways, but probably most prominently by the fact that the school management team includes individuals with traditionally poorly represented protected characteristics: women, fractional staff, younger staff, parenting responsibilities, and LGBTQ staff.

This culture of inclusivity and supporting diverse staff in their career progression is evident in the unit staff composition: all academic staff are on 'teaching and research' contracts and hold SRR; in 2018, 42-44% were women, much greater than the 2016/17 HESA benchmark of 26%; 14% of staff identified as BAME, as compared to benchmarks for SET staff of 10.8%. Between 2014/15 and 2017/8, the gender balance across academic staff in the unit was stable (percent women by year: 58% 2014/5, 56% 2015/16, 62% 2016/17, 58% 2017/18). In the same period, the gender balance of senior academics (\geq Grade 7) has grown steadily to better reflect the gender balance across all staff (\geq Grade 7 percent female by year: 25% 2014/5, 18% 2015/16, 46% 2016/17, 50% 2017/18). This best practice is reflected in the Faculty of Science and Engineering's 2019 Athena SWAN Bronze Award, from which this data is drawn.

A **Flexible Working policy** is in operation in the institution. Fractional working is supported in the unit (in 2019-20 8 staff are on fractional contracts, including 3 in senior and management roles) through clear expectations around emails and working outside contracted hours, and consideration of fractional status is given in all decisions around work allocation, evaluations for funding and access to research support from the unit. Support exists at an institutional level from the Part-Time and Flexible Working Forum, which organises regular events for staff. **Flexible**

working, including remote working, is widely practiced by staff in the unit and all staff have access to remote desktop. Staff meetings and away-days are organised with the constraints of fractional staff in mind, aiming for different days of the week and within family-friendly hours.

When staff take leave, such as **maternity or parental leave**, the School provides funds for teaching cover, and the unit puts in place a fixed-term appointment to ensure staff leave does not lead to additional workload for other staff. While on leave, staff are able to utilise 'Keep in Touch' days and upon return, the unit guarantees access to a research funding scheme and supports returners to make use of research capacity building schemes: for example, two staff who have taken maternity leave during the assessment period have successfully applied for sabbatical within 12 months of returning to work.

Unit REF preparations were undertaken with due regard for inclusivity and ensuring appropriate staff representation. Processes were transparent and open to all staff, with the selections process based on assessments from external sources blind to unit staff. Output selection was conducted as per the institution code of practice. Staff were free to make their own independent requests for reduction in outputs submission based on their circumstances, independently of the unit convenor or school management.

Impact Case Studies were the focus of considered strategic activity in the unit (See Section 1). Final selections were made based on the preparedness of the study and strength of supporting evidence. This was based on feedback from RAND Europe and from the Institution REF team (Deputy Vice Chancellor Research & Innovation, Faculty Deputy Deans Research & Innovation, RIDO Head of Research Excellence & Enhancement, RIDO REF Assistant Manager, Director of RIDO) during mock REF exercises held in 2019 and 2020.

This Environment Statement involved staff at many career stages and roles within the unit: a Research Centre Director (Swami) drafted the statement for the mock REF and reviewed later drafts, co-convenors (Forwood & McDermott) edited the statement following the mock REF, a research student (McKendrick), an ECR (D'Souza), and an Athena Swan panel member (Zawisza) contributed material for Section 2: People, a mid-career researcher (Morein-Zamir) contributed extensive material for Section 4: Collaborations, and institution administrative staff provided data sets for completing the rest of the statement.

3. Income, infrastructure, and facilities

Income

Attracting research funding within the unit was a key focus throughout the assessment period and will continue to be over the next REF period. Mirroring the career development attained by our ECRs and staff recruitment during the assessment period, the unit has experienced significant growth and a diversification of research grant funding since 2014. Compared to the £222,233 that was generated during the REF2014 cycle, the unit obtained £797,672 in the current REF cycle (or from £13,307 per FTE to £27,696 per FTE). This represents a 208% increase in grant funding per FTE and speaks to the success of the unit's investment and strategic research objectives.

This success in increasing income and grants over the assessment period was a result of the strategic objectives from REF2014 (See Section 1). While this was not driven by any single action taken by the unit, it was the result of a suite of actions working in consort. For instance, the school

set an expectation that all research active staff would include applying for research income in appraisal goals. The appraisal process ensured that completion of the goal was reviewed annually. Goal setting was supported through unit activities (e.g., research mentor scheme, communication of opportunities) and institutional infrastructure (e.g., access to the Research Professional funding portal, business partners in RIDO to support consultancy or KTP, training from RIDO on preparing grants) to ensure staff were supported to align funding applications with research capacity and career stage.

Going forward, as our staff and Research Centres develop, it is expected that the unit will see a further increase in income due to Research Centres growing their interdisciplinary partnerships and raising their profile (REF2021 Objective 1: Fostering Research Centres and REF2021 Objective 3: Supporting External Partnerships). In this transition, the unit will monitor capacity for senior research staff to lead on securing grants and delivering projects and will use existing frameworks – such as research mentorships, shadowing schemes, and faculty grant peer-review processes – to upskill potential principal investigators with the competencies needed for larger scale grant applications and project delivery. Goal setting will expand from staff-level to Research Centre-level as these centres establish their profiles.

All unit activity to support income generation is supplemented by training and support staff from the faculty and the institution, promoted directly to all staff through faculty research days, training, and digital communication. In terms of the Faculty, these include a research escalator framework for guiding staff decisions on research projects, bid-writing days supported by external speakers from Cloud Chamber and the Missenden Centre, and dedicated faculty Research Income Managers (Steve Abbott and Aimi MacCormac) to provide one-to-one support for grant costing, collaborative grant proposals, and application review. Institutional support is provided by the Research and Innovation Development Office (RIDO) and includes access to Research Professional to search for funding opportunities, a range of workshops included for grant-writing and grant review for resubmission, and post-award support for funded projects.

Examples of our successes demonstrate unit staff are securing awards from competitive sources for collaborative projects: £168,950.73 (2015; Filippi/Bright, shared with UCL) from the Leverhulme Trust for “Multi-language acquisition across the lifespan”; £134,594.46 (2018; Ford, shared with Faculty of Health, Social Care, Education & Medicine) from Action Medical Research for “Evaluating the effectiveness of 'sticky mittens' for enhancing cognitive development from ages 4 to 15 months”; £30,313.48 (2018; Aspell/Cardini) from BIAL for “Changes in neural representations and body perception during pregnancy”; and £190,344.50 (2020; Aspell/Cardini) from Versus Arthritis for “Multisensory body representation in fibromyalgia and testing a possible intervention”.

In line with the unit REF2014 Objective 4 to develop capacity for knowledge transfer and other impact, a second strategic activity to increasing research income has been to diversify our funding base. With a view to promoting impact, there has been emphasis on non-traditional revenue streams such as KTPs or partnership projects with local organisations. Staff were supported during the assessment period with unit and institutional support (See Section 1) and partnership remains an ongoing focus (REF2021 Objective 3: Supporting External Partnerships).

Examples of our successes demonstrate staff are using a wide range of funding, including: consultancy income of £316,208.25 (Bristow) secured by the ARU Biomarker Lab; KTP projects

of £194,375.00 (Pearson/Sherratt/Zawisza) from Innovate UK working with Ringway Jacobs Ltd and of £150,000 (Forwood/Bristow/Lee) from Innovate UK working with England Marketing; Interdisciplinary and commercial collaboration of £30,254.06 (Jansson-Boyd) from EEDA/ERDF working on Smartlife Retrofit for Business project; public sector partner project of £21,671.27 (Kaminskiy) from Cambridgeshire and Peterborough NHS Foundation trust; and UK regional network lead organisation (McDermott) on a Social Sciences & Health Research Council of Canada partnership project: International Partnership for Queer Youth Resilience (INQYR, CA\$2.5m, 2018-25).

Infrastructure and Facilities

The unit has benefitted significantly from a £45 million capital investment project by the institution. In November 2017, the faculty took occupancy of the Science Centre on our Cambridge Campus. This building provides teaching and research facilities for the School of Psychology and Sport Science, the School of Life Sciences, the School of Computing and Information Sciences, and houses Faculty professional services. At the same time, capital investment to the Science Centre provided for replacements or provision of new state-of-the-art equipment.

The current facilities provide the research spaces needed for all unit activities. Research requiring specialist equipment and spaces, such as cognition or body and self research, uses rooms equipped with Virtual Reality capabilities (Oculus Rift), moveable cameras, 64-channel active electrode EEG setup within a Faraday Cage, with a 32" monitor, two BrainStim tDCS stimulators, a Magstim TMS, a Biopac fNIRS, button boxes, and a suite of AD Instruments PowerLabs with a non-invasive continuous blood pressure machine, which allows researchers to record various physiological measures, and a Dynmap V100 for validation of blood pressure. We also have a driving simulator with which to study various aspects of driving competence and safety, and computer gaming technology. Separate research spaces are customised to be accessible, safe and appealing to accommodate research that recruits children and parents or participants with limited mobility. Finally, the unit has a customised assay-based wet-lab facility for the analysis of saliva for a range of hormones and enzymes such as cortisol, testosterone, and α -Amylase and of hair samples for cortisol and testosterone, providing more long-term, retrospective measurement (ARU Biomarker Lab). During the COVID-19 pandemic, following a request from 10 Downing Street, key lab equipment from this lab was donated on loan for use in the Milton Keynes COVID-19 testing facility (April–November 2020).

These specialist laboratories, along with a further 18 flexible testing rooms, portable and fixed eye-trackers, psychometrics lab for multi-participant testing, and social lab for social behaviour and focus group research, are all for the sole use of unit staff, students, and their collaborators. The unit allocates space proportionately between research, impact, and consultancy. Adjacent to the labs are offices for technicians, research assistants, and doctoral students, equipment storage and two research meeting rooms. This modern, vibrant, and well-resourced space ensures that unit research is visible and accessible to staff, students, and campus visitors.

Research in the unit is supported by 3 part-time Psychology Technicians (total 2.0FTE) and 2 part time Lab Technicians (total 1.0FTE), who coordinate room bookings, support setup and storage of specialist equipment, provide support and training for staff and students, and liaise with central technical support to ensure all computer and laboratory equipment is fully operational. The unit operates a continuous unit-level space allocation process to ensure all resources are accessible to all staff, subject to training and competencies. The process is agile and responsive to the needs

of staff and students, such as accommodating new method development or seed projects; and can also support projects with a fast turnaround from funding to delivery, such as consultancy and impact work.

QR funding is used to support ongoing research activities and investments in additional measurement tools and facilities, for the benefit of staff and students. For larger scale costs, specific capital investment requests are submitted to the University during the strategic planning cycle to support growth and replacement of legacy equipment within the unit, based on current and future research needs.

Involvement in further cross-HEI collaborations for shared use of research infrastructure is an ongoing strategic focus for the unit. The unit was part of the recent successful collaborative venture to install a research focussed 3T fMRI scanner at the University of East Anglia, Norwich. The installation of this facility was delayed by the COVID-19 pandemic and was completed in January 2021. Growth of collaborative use of research infrastructure in other UK institutions and benefits-in-kind from partner organisations are part of our objectives for the coming REF period, as a result of increased Research Centre profiles (REF2021 Objective 1), interdisciplinary research (REF2021 Objective 2), and stronger external partnerships (REF2021 Objective 3).

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

The unit staff engage in diverse contributions to research, the economy, and wider society, with collaborations ranging from international consortia and world-leading researchers, to international businesses and governments. Current arrangements for supporting collaborations and wider contributions sit both across the unit and within the Research Centres. Our objectives for the forthcoming REF period, post 2021 are to strengthen the reputation of our Research Centres (REF Objective 1: Developing Research Centre Profiles), as well as offering a critical mass of researchers with expertise and excellence (REF Objective 2: Focus on Output Quality) open to collaboration and partnership with stakeholders (REF Objective 3: Sustainable support of External Partnerships and Impact) to win investment from external sources. The following highlights the collaboration and contribution strengths of each Research Centre.

The Centre for Mind and Behaviour (ARU-CMB) staff work with international and world-leading collaborators to research bilingualism (Bright, with UCL); cognitive development, particularly in neurodevelopmental disorders (D'Souza, with Oxford, Cambridge and Birkbeck); development of memory (Ford, Queensland); and interoceptive awareness (Aspell, with Lausanne, Stockholm, Cambridge); and expertise on impulsivity and inhibition of actions has contributed to an international consensus publication providing guidelines for methodology (Morein-Zamir).

International academic collaborations are central to the research conducted in the ARU-CMB. Morein-Zamir collaborates with researchers in behavioural control, impulsivity, and response inhibition, leading to involvement in projects that are beyond the scope of the unit's facilities (UK, Israel). Lambie is contributing expertise on emotional validation as part of a research project (Netherlands) exploring deaf children's development. Staff have been involved in organising a variety of national and international conferences, including: Association of the Scientific Study of Consciousness Meeting (2018-20 Aspell) and Research Recovery Network (2018-20 Kaminskiy).

Stakeholder interaction with organisations that represent patient groups has been essential for staff researching diagnosis and intervention for patients. Headway, a charity working with people recovering from head injury, works with unit staff working on improved methods for determining pre-morbid IQ (Bright), and a clinical psychologist working on interventions to support individuals who have experienced head injuries (Ashworth). This collaboration has supported both staff projects and a Research Student (Buckland) who was part-funded by Headway.

Stakeholder interactions have also been hugely productive for staff researching development. In partnership with Skylark Literary, a children's literature and toy production house, Lambie's research on emotional validation has had impact on mother-child relationships and emotional development (see ICS 1). Similarly, Ford's research in childhood memory is being used to design a book set, currently in development with Skylark Literary to be released in 2021. Development research is also having policy impact: research from an ongoing project on cognitive development in preterm infants using 'Sticky mittens' (Ford) has been presented at multiple Action Medical Research events, including at the House of Lords in October 2019.

The ARU Centre for Groups and Society (ARU-CGS) is approached specifically and repeatedly for their expertise in gender identity, wellbeing, and body image research, all national and international priority areas. McDermott's expertise on gender identity has contributed to an international consortium of academic and community partners in Canada, the UK, the US, and Mexico (INQYR) led by the University of Toronto exploring health and wellbeing among gender and sexual minority youth. Zawisza's expertise on gender and marketing has contributed to an international study led by the University of Gdansk on masculinity threat and gender equality. Since 2017, Boniwell's expertise on wellbeing in educational contexts and interventions for promotion resilience has contributed to national-level curriculum reviews in the UAE, Morocco, China, and France. Swami's expertise on body image has led to the formation of an international consortium, formed in 2017, now spanning 54 countries.

Academic collaborations are central to the research activities of the ARU-CGS. Swami established the PU-ARU Centre for Psychological Medicine (Malaysia) and, in his role as Director of the centre, has led or facilitated numerous projects involving both staff (Cardini) and doctoral students (Todd) from the unit. McDermott is part of international collaborations (UK, US, Canada) studying gender and sexualities. Zawisza is part of an international collaboration exploring cross-cultural difference in masculinity threat and gender equality (Poland, USA, Chile, Spain). Swami leads international collaborative projects on body image (Austria, Brazil, China, Israel, Italy, Malaysia, Romania, Spain) and mental health literacy (Austria, Romania), and is part of a consortium examining schizotypy cross-nationally (Australia, China, Malaysia). ARU-CGS staff have been involved in organising a variety of national and international conferences, including: International Society for Justice Research Meeting (Harvey); Political Masculinities as Agents of Change (McDermott); Preaching to the Choir – International LGBTQ Psychology event at ICAP 2018 (McDermott).

Stakeholder interactions with organisations that represent minority groups have been vital for research in the ARU-CGS. The Kite Trust is a Cambridgeshire-based charity that provides face-to-face support for LGBT young people working with our staff (McDermott). Action for Happiness is a national movement of people committed to building a happier and more caring society, which includes a member of our staff on the Expert Advisory Board (Boniwell). Policy impact has also been shown by ARU-CGS research. Research into gender stereotypes in advertising (Zawisza) was cited in an Advertising Standards Authority's 2017 Report on 'Depictions, Perceptions and

Harm: A report on gender stereotypes in advertising'. This report led directly to the introduction of new tougher rules guarding depictions of gender in advertising, enacted in 2019.

The ARU Centre for Society and Groups is well-placed to flourish moving forward, as its expertise ties in with national and international priorities on topics such as discrimination for marginalised groups (gender, sexual identity, conflict zones, behaviour change, policy, and advertising), and includes staff with strong track records of collaboration and community engagement (Swami, Zawisza, McDermott, Jansson-Boyd).

An example that highlights these strengths is Swami's collaboration with Guerrilla Science, an international science communication organisation. Swami worked with Guerrilla Science to develop Attraction Lab, an innovative science engagement format that incorporates practical activities and speed-dating to communicate the science of attraction to a paying audience. In addition to being directly informed by the research contained in *Attraction Explained* (Swami), Guerrilla Science also benefited from Swami's scholarly expertise to shape event content and deliver events across the UK (London's Book Club 2017, Shambala 2018 and 2019, and Citadel 2018). These Attraction Labs generated a new source of income for Guerrilla Science and, following successful funding bids, the design, development, and delivery of three Queer Attraction Labs, aimed specifically at queer audiences (London's 'The Glory' and 'The Chateau' in 2018; New York's 'Caveat' in 2018) and a new Attraction Unplugged workshop (London's 'Colours Hoxton', November 2019).

Engagement with communities and publics

Dissemination and engagement with the wider community is practiced extensively by staff within the unit, and is supported by the unit through collaboration, and by the institution through professional support staff (Senior Press Officer – Jon Green; Public Engagement Officer – Miriam Berg).

Of the 34 staff in the unit, 25 have been named in the UK and international media since December 2016 – in a total of 1865 interactions – ranging from magazine articles (e.g., *Mother and Baby* from Kirk 2018, *MoneyWeek* from Jansson-Boyd 2017, *Scientific American* 2019 from Swami), live radio interviews (e.g., BBC Radio 4 discussing thin body ideals from Swami, BBC 5 live *Drive Time* discussing research on food choice behaviour from Forwood), to daily newspaper articles (e.g., Charitable behaviour associated with awareness of heartbeat in *The Times* and *Daily Mail* from Aspell, Hiding emotions from children in *The i Paper* from Lambie), and television and streaming appearances (e.g., BBC's *The Truth About...* and Netflix's *Explained* from Swami), with an estimated comparable advertising value through media work of £3.3million. While staff do engage in national and high-profile media activity, around half of our media activity is local, with appearances on BBC Radio Cambridgeshire and Heart Cambridge – radio stations local to the unit – accounting for 19%. This local activity embeds unit staff in our local community and ensures our expertise is visible in the local community.

Furthermore, staff are encouraged to ensure their expertise is shared in fora that permit wider interactions. These include writing for the Conversation website, to which ARU is a contributor (Jansson-Boyd, Swami, Lambie, Zawisza, Kuppen) and appearing with the Naked Scientists, a web-based science radio programme (14 appearances by Keyes, Swami and Jansson-Boyd in 2018-19). Staff have taken part in local science public engagement activities: both Cambridge Festival of Ideas and Cambridge Science Festival take place annually and staff are involved in

talks and panel discussions, ranging from smaller groups with opportunities for in-depth discussions to hundreds from the local community. Following its postponement in 2020 due to the COVID-19 pandemic, in September 2021 ARU will also host, and unit staff will contribute to, the British Science Festival in Chelmsford, a large-scale national science outreach event.

Indicators of wider influence

Staff are expected to participate in the wider academic community. A unit-based funding scheme permits staff without external funding to cover conference costs for the presenting researcher, with a budget of £1,500 per staff member over 2 years, and the unit has hosted the BPS East of England Annual Conference in 2017 and 2019.

Staff are recognised for making varied and significant contributions to both national and international academic societies. Staff within the unit are members of a wide range of professional bodies: from President of the Institute for Research on Positive Education (Boniwell), membership of the Board of Governors of the Asian Psychological Association (Swami), Vice-Chair of the Francophone Association of Positive Psychology (Boniwell), and many fellows and members of the Psychonomic Society (e.g., Morein-Zamir), the Experimental Psychology Society (e.g., Cardini), International Association for the Sociology of Sport (e.g., Owen), the Cognitive Neuroscience Society (e.g., Bright), the Health and Care Professions Council (e.g., Sadek), Advance HE (e.g., Jansson-Boyd), and British Psychological Society (e.g., Kaminskiy). Fifteen of our unit staff have been invited to give keynote talks nationally and internationally. Two staff have been commended with prizes: in 2017 McDermott was awarded the Emerging Scholar Award to the Society for the Scientific Study of Sexuality, also in 2017 Boniwell, was winner and laureate of pedagogical innovation prizes, selected by the French Ministry of National Education.

Finally, staff make contributions to the international academic community through the reviewing of manuscripts submitted for review, grants and taking on editorial roles in academic journals. Eleven staff have editorial roles for both national (e.g., Morein-Zamir; British Journal of Clinical Psychology) and international journals (e.g., McDermott; Psychology & Sexuality), a further 6 sit on editorial boards (e.g., Zawisza; Sex Roles). Across the current review period, unit staff have reviewed funding applications for 21 organisations, from the Wellcome Trust, the Leverhulme Trust, the MRC, the BBSRC and the ESRC in the UK, to a range of international organisations including the Austrian Science Fund, the Carnegie Trust, the Israel Science Foundations, the Netherlands Organisation for Scientific Research, the Canadian Social Science and Humanities Research Council, EU Horizon 2020, and the Marie Skłodowska-Curie Fellowships.