

Institution: Queen's University Belfast
Unit of Assessment: 4
<p>1. Unit context and structure, research and impact strategy</p> <p>The School conducts fundamental and applied psychological research that has both a regional legacy in Northern Ireland and a global resonance. We achieve this through our four interlinked research themes: Development and Cognition; Health, Welfare and Clinical psychology; Perception and Action; and Social Psychology.</p> <p>The School has a number of notable achievements during the REF period:</p> <ul style="list-style-type: none"> • Building on our record as the first psychology department in the UK to receive an Athena SWAN Gold Award for outstanding progress in promoting gender equality, we are now leading on an interdisciplinary EPSRC grant on gender equality initiatives in STEM. Initial findings published in <i>Biosciences</i> highlight how these initiatives should be framed to promote buy-in from both male and female STEM academics. • Comprehensive response to the Covid-19 crisis: The School is involved in several high profile UKRI funded research projects such as the COVID-19 Cognitive Neuroscience (COVID-CNS) project. It has also led on research with the Queen's Gender Initiative and the University's Organisational Development Unit to understand the gendered impact of lockdown on academic productivity and offer evidence-based solutions. • The Centre for Identity and Intergroup Relations has engaged with Northern Ireland's political context to produce influential research on intergroup conflict, which is now being successfully applied to international contexts, for example British Academy, GCRF and RBT projects on enhancing community relations among young people in Bosnia and Herzegovina, Colombia, Croatia, Kosovo, and Macedonia. • The School received a series of grants from ESRC, AHRC, and the Leverhulme Trust worth over £1M on the under-researched area of thought about time and its development; this work has yielded a new theory of temporal cognition. • Evidencing our collaborative, interdisciplinary, and international research culture, 84% of publications during the last REF period are with external collaborators, 52% have international co-authors and 77% involve an interdisciplinary partner; 35% of our research income is from interdisciplinary grants. • We have utilised our research findings to engage with government departments: We contributed to the Physiological Society Policy Report to UK Parliament, 'Growing Older, Better' in response to the UK government's Healthy Ageing mission. We also presented evidence at Westminster to parliamentary committees, e.g., Defence Select Committee on veteran mental health; joint hearing of the Women and Equalities, Education, and Petitions committees on making race and racism education compulsory in the UK school curriculum. <p>We have strengthened our research profile since 2014, with considerable investment in new staff in areas of institutional strategic priority. The significant growth of activity and capacity in the Health, Welfare, and Clinical Psychology theme has been a notable change, including the appointment of two world leaders (Armour and Vowles). This theme aligns to one of the strategic research themes prioritised by the University, A Healthy and Independent Future for All. Additional appointments in the area of Social Psychology align with the University's theme of Inclusive and Cohesive Communities.</p> <p>Organisational structure, size and context</p> <p>The School sits within the Engineering and Physical Sciences Faculty and has 36 academic staff (34 FTE) who engage in research. The Director of Research, supported by the research administrator and with leadership from the Head of School, supports four interlinked and internally collaborative research themes, which in turn are each led by a senior internationally</p>

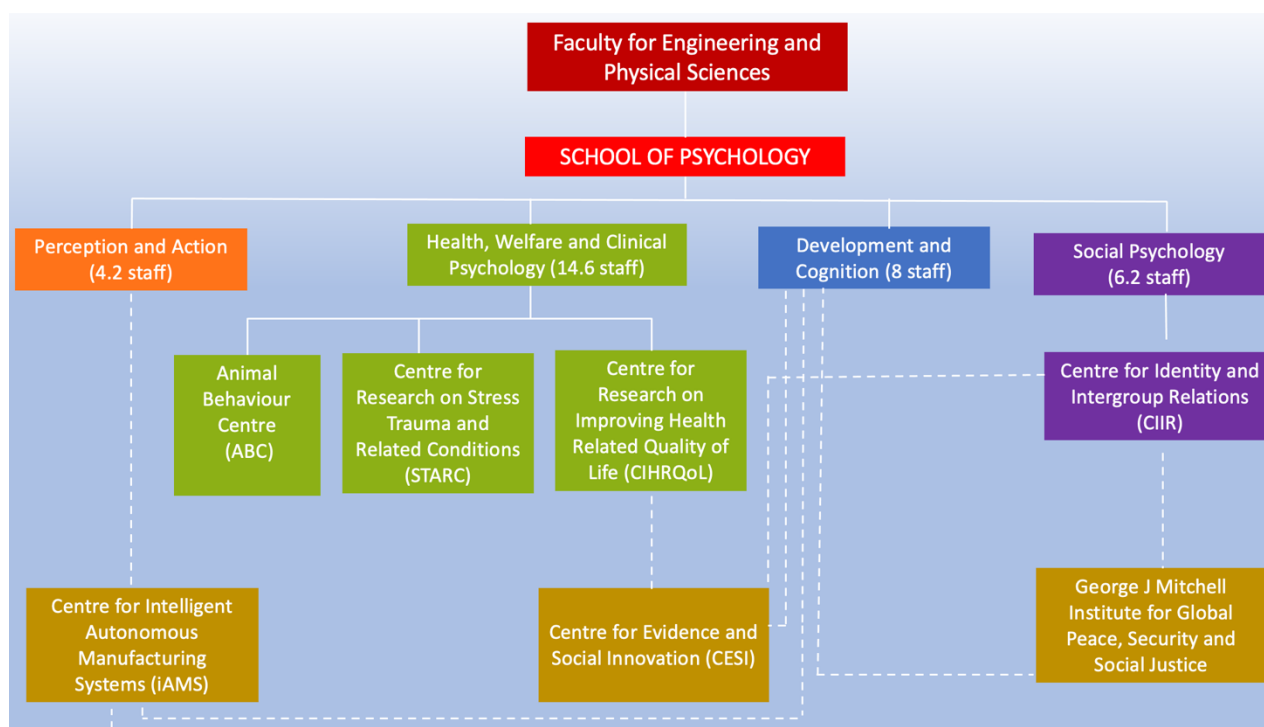
recognised researcher. As our largest, most diverse theme, Health, Welfare and Clinical Psychology is comprised of three research centres, each with its own lead.

The management structure ensures that members of each theme receive support from research-aligned colleagues, sub-discipline specific guidance and leadership from the theme lead. Strategic guidance comes from the Director of Research who has oversight of research across the School. Research themes meet monthly to discuss priorities and share ideas, with the Director of Research and theme leads providing mentoring and support, particularly for ECRs.

Each group is affiliated with one or more of the interdisciplinary research centres set up during the REF period by the University to connect researchers across disciplines in order to address important global challenges (depicted bottom of Figure 1; see Section 2c of Institutional Statement). The School is central to interdisciplinary research within the university and beyond, given that human behaviour is an important component of many academic disciplines.

Numerous members of the school are Fellows of the Senator George J. Mitchell Institute for Global Peace, Security and Justice, the Centre for Evidence and Social Innovation (CESI), and the Centre for Intelligent Autonomous Manufacturing Systems (iAMS). The School has strong intra-faculty (e.g., Computer Sciences, Engineering, Architecture, Sonic Arts), and cross-faculty links (e.g., Education, Modern Languages, Politics, Medicine, Nursing and Midwifery, Music).

Figure 1. Organisational structure of the School



Following recommendations emerging from an international review of the School in 2016 led by Dame Professor Vicki Bruce, new strategic appointments have been made to complement the four core disciplinary research groups and provide leadership. The School has made 21 appointments since 2014, 11 in Health, Welfare, and Clinical Psychology (2 Professors, 2 Senior Lecturers, and 7 Lecturers), 7 in Social Psychology (1 Senior Lecturer, 5 Lecturers - 1 since promoted to Reader and another to Senior Lecturer - and 1 Marie Skłodowska-Curie Research Fellow), and 3 Lecturers in Development and Cognition.

Research and Impact Strategy

Three principles guided research activity and development during the REF period: (1) Selective development of areas in which the School can develop a sustained and distinctive international profile; (2) Encouraging and supporting interdisciplinary research; and (3) Maximising the impact and real-world application of our research findings. Each is addressed below.

1. Selective development of areas in which the School can develop a sustained and distinctive international profile. We have built a critical mass of disciplinary excellence in four distinctive areas.

(i) Development and Cognition. This theme focuses on cognition and its development, especially in relation to higher cognitive functions such as reasoning, memory, and language.

Achievements and developments: Work on socio-cognitive development has led to a series of papers on children's developing understanding of membership in religion, language and nationality categories and to the recent award of a grant from the Templeton Foundation as part of its Developing Belief Network. Work on regret in children funded by the ESRC has established for the first time how regret systematically affects children's decision making. Longitudinal developmental studies have demonstrated novel links between attentional processes in infancy and behavioural control later in childhood. Other work in the group focuses on the area of speech and language, examining the auditory precursors to speech processing and the impact that these have on later literacy development, including in atypically developing populations and among bilinguals.

Research on the development of temporal cognition has yielded two ESRC-funded projects, which have uncovered a link between children's ability to delay gratification and their future time perception. This work has a strong interdisciplinary focus, including a philosophy/psychology AHRC project 'Time: Between Metaphysics and Psychology', which has been conducting ground-breaking empirical studies on people's folk theory of time. Two further interdisciplinary projects with philosophers were funded by Leverhulme, one that has demonstrated new relations in temporal and causal cognition in children, and another that is currently examining the links between the emotion of relief and temporal cognition in both adults and children. Collaboration with Aperture IVA has examined the role of advice and future thinking in the decisions made by people with problem debt (see Case Study).

Future work in this theme will remain focused on the development of higher-level cognitive processes and how these impact on and interact with other aspects of socio-cognitive, emotional, and cognitive development, as well as exploiting members' existing interdisciplinary collaborations to ensure that this work has broad academic impact.

(ii) Health, Welfare, and Clinical Psychology. This large theme, which has grown substantially since the last REF exercise (from 8 to 15 staff members), encompasses three research centres, with activities which align with the University's strategic research themes of 'A Healthy and Independent Future for All', 'AI and the Data Revolution', and 'A Symbiotic Human and Natural World' (see 2e of Institutional Statement).

Achievements and developments:

(a) The **Centre for Improving Health Related Quality of Life (CIHRQoL)** examines treatments for health conditions including chronic pain, cancer, heart disease, and alcohol and opioid addiction. It has comprehensively modelled illness perceptions and psychological distress outcomes among people with cancer, advancing the development of illness perceptions-based interventions. Research has also revealed that hazardous prescribed opioid use occurs in a significant minority of individuals with chronic pain and has established the efficacy of one of the only existing integrated treatments for co-morbid chronic pain and opioid abuse. The theme additionally provided the first comprehensive evaluation of diagnostic and psychometric research evidence on alcohol screening and assessment for young people.

Funded by the NIHR, US NIH, MRC and ESRC, chronic pain research has impacted [national](#) and [European](#) policy and practices, with CIHRQoL leading on the development of new guidelines for chronic pain treatment. Vowles served as co-chair, and the only psychologist, on the task force commissioned to establish these guidelines. The research on alcohol screening has informed the US National Advisory Council on Alcohol Abuse and Alcoholism [guidance](#) on how to screen for alcohol use and problems in Girls and Women.

Going forward, CIHRQoL will be responsive to emerging research opportunities to improve psychological well-being among people with long-term illness and to develop behaviour change interventions, with a particular focus on NIHR priorities. It will also engage in wider dissemination of integrated treatments to substance use disorder clinics, where chronic pain is a prevalent and untreated healthcare concern, establishing evidence-based guidelines for interdisciplinary care for chronic pain.

(b) The Centre for **Stress, Trauma and Related Conditions (STARC)** focuses on the impact of stressful and traumatic life events on psychological wellbeing and mental health. It produced a body of literature that confirmed a dissociative subtype of Post-traumatic Stress Disorder proposed in DSM-5 across a variety of trauma populations and was the first to apply network analyses techniques to DSM-5 PTSD symptom data, yielding influential findings. The Centre's work has an established reputation regarding military mental health and has demonstrated that military veterans residing in Northern Ireland have fewer supports post-service compared to their veteran counterparts in the other three nations of the UK. Yet, based on a multitude of socio-political reasons they have poorer mental health generally and experience a greater degree of help-seeking barriers. STARC recently pivoted its focus to the mental health consequences of COVID-19, through involvement in several high profile UKRI funded research projects such as the COVID-19 Cognitive Neuroscience project. Funding has been leveraged from sources including UKRI, ESRC, MRC, Forces in Mind Trust, and Department of Health.

STARC will continue to grow its research strengths in the identification of risk and resilience factors for posttraumatic outcomes across a variety of trauma populations. Following approaches from defence forces in other countries, STARC will also expand its research into military populations globally. Building on its work on social and psychological risk and resilience factors, it also intends to help uncover the biological basis of posttraumatic outcomes.

(c) The **Animal Behaviour Centre (ABC)** explores the value of novel measures (e.g., laterality, cognitive bias) for assessing animal welfare and the use of enrichments as a tool for enhancing animal well-being. A BBSRC-funded project uncovered the use of motor asymmetry as a novel tool for assessing welfare risk in companion animals. ABC also examines the role of canine olfaction in the detection of human health disorders, including hypoglycaemia, epilepsy and stress-related conditions. Central to its work is the human-animal bond, with a particular focus on how pets can improve the psychological health of their owners. This work routinely features in the media (e.g., [The Guardian](#), [Daily Telegraph](#), [Irish News](#), [National Geographic](#)).

The ABC's existing work on lateral bias and canine olfaction will continue alongside new research exploring the effect of COVID-19 on pet-owner relationships. This work will have an emphasis on the health benefits that can arise for pet owners during a global pandemic and assess the problems that may emerge, e.g., the onset of psychological problems in pets, relinquishment to animal rescue shelters.

(iii) Perception and Action. This theme conducts fundamental research as well as developing and deploying applications to improve health and well-being across the lifespan, including sports and rehabilitation. Research is aligned with the University's strategic research themes of 'A Healthy and Independent Future for All' and 'AI and the Data Revolution'.

Achievements and developments: The theme developed the Science in Motion lab (see Section 3), one of the largest and most comprehensively equipped motion-capture and VR/AR

facilities in the UK. Beyond utilising these technologies for high-quality data recording and analyses, innovative contributions have been made to research methodologies through custom applications, and integration across technologies. These innovations showed that self-generated sounds controlled by the speed and distance of stepping movements can improve walking stability among people with Parkinson's disease, and that melodic sequences triggered by one's own actions can enhance learning and memorisation of difficult movement coordination patterns.

Much of the theme's work is interdisciplinary. One current project, for instance, exploits principles governing psychological and sensorimotor behaviour in the context of human-robot interactions, with the aim of improving close-contact interactions in future manufacturing environments. UK and international funding for the research has been received from BBSRC, EPSRC, EC-FP7-COFUND, Wellcome Trust, Leverhulme Trust, ALS Association (US), Health Research Board and Medical Research Charities Group (Ireland), National Stroke Foundation and Australian Research Council (Australia), and Blind Children UK. Research is facilitated by close cooperative relationships with sports teams, patient groups, Parkinson's UK, and University of the Third Age.

Future plans include building on existing research strengths to expand the integration of perception and action psychology into cutting-edge 'human-in-the-loop' technological domains, such as robotics, intelligent manufacturing, affective computing, and the digital creative arts.

(iv) Social Psychology: Social psychology at Queen's has historically engaged with Northern Ireland's political context to produce research on social identities and intergroup conflict. Although this landscape continues to be a rich environment for the study of intergroup relations, the theme also examines national and numerous international contexts. The research in the theme aligns with the University's strategic research themes of 'Inclusive and Cohesive Communities' and 'AI and the Data Revolution'.

Achievements and developments: The **Centre for Identity for Intergroup Relations (CIIR)** was established in 2015 to address fundamental and applied issues that are the current focus of intense interest amongst policymakers within Northern Ireland and globally. Its research has shown the benefits of diversity approaches for school outcome trajectories among adolescents. It has also developed novel interventions to predict confidence at engaging in intergroup contact and revealed that intergroup contact promotes helping behaviour in primary schools in local and international post-conflict contexts. An EPSRC project has developed methods to enhance support of gender equality initiatives (GEIs), particularly among men in engineering and physical sciences. Findings reveal men are more likely to be in favour of GEIs if they are perceived as benefiting men *and* women because it reduces concerns of unfair treatment and increases internal motivation to engage with GEIs.

A notable methodological development in the theme has being the use of Augmented and Virtual Reality technology to change cross-community behaviour and promote gender equality among STEM academics, funded by a [Marie Curie Fellowship](#) and the aforementioned EPSRC grant. The Social Interactions Lab, which overlaps with CIIR in its research interests, while also undertaking distinct work, focuses on understanding emotion and social behaviour through affective computing processes. It has recently completed a Leverhulme Project with the Perception and Action theme which demonstrated that although one often talks of laughter 'types' - such as joyful, taunting and schadenfreude - laughter is an inherently ambiguous signal whose interpretation is largely determined by the social context in which it occurs. The perceived meaning of laughter can be radically changed simply by presenting it in a different social context.

During the REF period, CIIR hosted national (SPSSI UK, 2017) and international (EASP, 2017; PEACE IV, 2019) conferences, was involved in an [award](#) winning [Channel 4 documentary](#) on tackling racism in schools, and gave evidence to a [parliamentary committee](#) on covering racism in the compulsory school curriculum (see Section 4). Highlighting its impactful interdisciplinary research, collaboration with Education specialists on a GCRF project examined how integration

in schools can promote educational success and peace in divided societies, including Bosnia, Croatia, Kosovo, and Macedonia. As a result, a network of academics and stakeholders across these countries is currently developing and evaluating pilot schemes to implement shared intergroup education in these locations.

Future developments include exploring the impact of non-dichotomous intergroup contact (e.g., between multiple majority and minority groups), and applying technological solutions (e.g., AR/VR, affective computing tools, and gamified interventions) to prepare people for successful intergroup contact.

2. Encouraging and supporting interdisciplinary research. The School has continued to exploit the unique interdisciplinary potential of psychology to contribute to any research involving the study of people or behaviour. This has included productive collaboration with areas as diverse as philosophy, pharmacy, the performing arts, politics, education, computer science, biomedicine and engineering. A key mechanism for facilitating this has been the University's interdisciplinary research centres (see Section 1), of which several staff are fellows, and which are aligned to the strategic research themes prioritised by the University. Below we outline examples of interdisciplinary research within each theme.

(i) Development and Cognition: A distinctive feature of the work on temporal cognition in this theme is that it addresses novel empirical questions that derive from long-standing collaborations with philosophers, yielding findings of both psychological and philosophical significance. The theme has also undertaken research with colleagues in pharmacy on the relationship between future thinking and medical adherence among chronically ill adolescents, research on supporting families with colleagues in social science and health, education, and social work, and work around language development and bilingualism with collaborators in modern languages and translation. A European COST action on reading in the digital age has been undertaken in collaboration with scholars of reading and literacy from across Europe.

(ii) Health, Welfare, and Clinical Psychology: **CIHRQoL** has contributed behaviour change expertise to multidisciplinary projects, for example ventilation weaning in intensive care (Health Foundation), increasing walking among people with visual impairment (MRC), and RCTs to improve outcomes among cancer survivors and those in palliative care involving medical professionals. **STARC** has developed apps and chatbots for mental health treatments with computer scientists, identified genetic markers of mental ill health with geneticists, implemented RCTs on PTSD treatments with nurses and psychiatrists, and examined how socio-political structures impact upon those experiencing distress and mental ill health due to the NI Troubles with social politicians and historians. **ABC** works with animal welfare and biological scientists.

(iii) Perception and Action: Recent collaborations with engineers involve optimising intelligent manufacturing systems, in particular human-robot coordination. A partnership with the Sonic Arts Research Centre at Queen's is examining auditory perception, music, and movement. A collaboration with architects has examined how characteristics of the environment can affect the nature and amount of walking in older adults.

(iv) Social Psychology: Projects on intergroup contact in schools have been undertaken with academics from education (ESRC GCRF; NIHR) and politics (AHRC, ESRC), while research on minority achievement involves collaboration with sociologists and educational scientists. The EPSRC Inclusion Matters Project is a collaboration with computer sciences and other EPS disciplines. The Social Interactions Lab is at the forefront internationally in establishing the area of affective computing as an interdisciplinary area richly informed by psychology, with members working with the Institute for Creative Technologies and the Institute for Law Governance and Society in Leiden University.

3. Maximising the impact and real-world application of our research findings. The School has a proactive Impact Champion, alongside a Communications Champion who leads on the non-academic dissemination of our research. As a result, the School has been successful at forming strong external links and attracting impact-related funding to deal with major societal challenges. Mini case studies exemplifying the impact of our findings are detailed in Section 4, but we briefly summarise some of our impact below.

(i) Development and Cognition: As well as working on a dyscalculia screening tool, the theme collaborates with researchers in Canada on a British Academy project that provides guidance for teachers in immersion education and other dual-language settings. The theme is involved in an evaluation of audio description for blind and partially sighted users in live tours, currently being applied to Titanic Belfast. A collaboration with animators on the scientific development of an education focused pre-schooler TV show on the development of listening skills is supported by Future Screens NI. The theme also collaborates with Advice NI testing the efficacy of a future thinking intervention in promoting adherence to debt advice.

(ii) Health, Welfare, and Clinical Psychology: CIHRQoL advises external organisations, including Alcohol and Families Alliance, WHO, NEBRIA, and Quality of Life Research, and offer CPD courses to training health professionals in Acceptance and Commitment Therapy. It also develops and evaluates interventions to improve quality of life in chronic pain, to tackle alcohol and opioid misuse, and to improve palliative care in hospices. ABC has developed interventions that have improved stress in zoo animals and in animal shelters. STARC, in collaboration with the HSC Trusts in Northern Ireland, has developed and is testing interventions for trauma and psychological distress as a result of chronic and serious health conditions.

(iii) Perception and Action: The theme has developed novel movement enhancement programmes for older adults, and people suffering from movement related disorders, funded by Parkinson's UK. They have also worked closely with sports teams in the context of virtual reality sports simulators.

(iv) Social Psychology: In addition to establishing interventions to promote intergroup relations in divided societies, CIIR has engaged in consultancy to evaluate local school-based interventions, including the Shared Education CASE Programme for the Education Authority NI (2019-2022), and advised on enhancing the effectiveness of Shared Education school-based contact for the Social Change Initiative. The Social Interactions Lab's Research with Sensum and Red Bull has resulted in KTPs and an Impact Case Study.

Open research

The School actively encourages open science through its Open Science workgroup. The workgroup has formulated an Open Science policy which covers all aspects of research practice. Critically, the workgroup has ensured that this links directly to the undergraduate and postgraduate programmes, where the first Open Science procedures have now been implemented (e.g., replication group projects, preregistration for student research projects, sharing of data and materials). All new PhD students get mandatory training in Open Science practices. Moreover, the workgroup plays a key role in maximising internal motivation of fellow staff, by informing them about the developments of and motivations for new research practices. In this respect, the School leads the way within the University and provides a reference for other Schools. The School is a member of the UK Reproducibility Network, which provides a link to other UK initiatives, and which has resulted in the introduction of a monthly University wide 'ReproducibiliTea' journal club which is attended by postgraduates. To facilitate the School's long-term plan of transitioning from using SPSS for statistics to the open-source software R, online training is currently offered to staff. In line with UKRI, staff are encouraged to make their data publicly available, via the institutions data repository. The School has also

created guidance for the Faculty Research Ethics Committee to make the adoption of open science easier within an ethical framework.

Research integrity and ethics

The School is committed to research integrity and governance, with staff adhering to the British Psychological Society Code for Human Research Ethics. Following a review and revision of ethical procedures, we led out on setting up a new Faculty Research Ethics Committee. This was externally audited successfully in April 2018. Several members of Psychology staff sit on and are nominated reviewers for the committee. This committee meets monthly and ensures full implementation of University regulations and policies that must be complied with for research involving human participants and/or animals. Its chair sits on the University's Research Governance Steering Group and all members have received research ethics training. The School is further supported by the University's research governance team who advise academics on ethical and governance issues. All research projects must be logged in an online University database, for the purposes of insurance and monitoring the ethical or governance issues that they raise. Sign off on any grant application is conditional on the Head of School formally confirming that the proposed research can be conducted ethically.

2. People

As described in Section 1, the REF period has seen strategic investment in staff in the School, with a considerable expansion of the Health, Welfare and Clinical Psychology group and the Centre for Identity and Intergroup Relations. We have also increased the proportion of senior staff members in the School through promotion and recruitment. New appointments have created a more coherent and focused staff profile, with academics aligned with one of the four research themes. The School recently committed itself to Investors in People (IIP), the international standard for people management, and was awarded Silver Accreditation, demonstrating our commitment to realising the potential of our staff. The School scored highly in enabling a collaborative working environment, designing roles for staff and creating autonomy within those roles, managing performance, and engendering a culture of continuous improvement, and has since been implementing a comprehensive IPP action plan to build on these achievements. Planned actions include strengthening a culture of recognition of success and developing leadership capabilities. In 2014, the School became the first psychology department in the UK to be awarded an Athena SWAN Gold Award for outstanding progress in promoting gender equality and addressing the unequal representation of women in science. The award was renewed in 2017.

Staff profile and recruitment. During the REF period, there has been a considerable change in staffing, in part stemming from an international review of the School led by Dame Professor Vicki Bruce in 2016, which recommended that we make strategic appointments in particular areas of research strength. Senior appointments were made to provide leadership in one of the research themes, as well as appointments to strengthen the Centre for Identity and Intergroup Relations and the Animal Behaviour Centre. The School is now comprised of 36 staff (34 FTE) on research and teaching contracts: 7.2 Professors, 8 SLs, 1.8 Readers, 6 non-probationary lecturers, and 11 probationary lecturers / Early Career Researchers (ECRs). We also have 9.4 FTE lecturers on a teaching-focused career pathway, allowing those on research and teaching contracts more dedicated research time. This compares to 24.9 FTE on research and teaching contracts, and no teaching-focused lecturers, at REF2014. The School also has a more senior profile following a series of senior appointments and internal promotions: 48% of REF eligible staff are at Professor, SL or Reader level, compared to 28% in 2014.

The School is led by the Head of School, supported by a School Management Committee comprised of the School Manager, the Deputy Head of School, the Director of Research, Director of Education, Undergraduate, and Director of Education, Postgraduate, and Director of Internationalisation. The School SWAN Champion keeps issues of equality and diversity at the

forefront of discussion and a School Representative helps ensure transparency in the decision-making process. Directors of Research and Education chair the School Research and Education Committees respectively, and decisions made by these committees are ratified at School Management Committee, and then by all staff through the monthly School Board meeting.

Staff development and career progression

Lecturing staff including ECRs. Newly appointed ECRs have a three-year probationary period during which they carry a substantially reduced (by one third in Year 1), but gradually increasing, teaching load, and do not hold large administrative roles. The School has a workload model developed in collaboration with staff, which ensures that teaching and administration activities are distributed equitably. Extensive training is provided centrally, and additional development needs are identified on appointment and through an annual Personal Development Review. All new staff are awarded start-up funds from the University and are prioritised by the School as primary supervisors for funded PhD studentships. On appointment, staff undergo a comprehensive induction process, meeting with the Head of School, Director of Research, Director of Education, and School Manager. A senior staff member mentors them, ensuring that the research environment is supportive, and guiding them towards confirmation in post. Probationary staff also meet regularly with a probationary committee which provides formal feedback, highlighting strengths and areas for improvement, leading to agreed action plans. Staff at all levels receive support from the research lead in their area, and the Director of Research, who provide assistance with grant applications and developing publication profiles.

The School's 'Partnerships in Promotion' scheme (a SWAN initiative) provides training in writing promotion applications and gives staff a forum to share support and tips. The success of this scheme can be seen in the fact that, in the first year after its introduction, there were an unprecedented number of promotions to SL (4), Reader (2), and Professor (1). Research leads in each area carry out the Personal Development Review process, which provides a formal channel for support, guidance and encouragement. This replaced the former University appraisal process during the REF period and is notable in that it focuses on development needs over performance (see 3a of Institutional Statement). Staff are additionally supported via a regularly updated handbook which contains detailed information about procedures in the School. We operate various schemes to support research in the School and create a positive and supportive research culture (see Section 4). Celebrating and rewarding success is an important aspect of creating a positive working environment. Staff, both professional service and academic, are rewarded for success through a voucher scheme and a discretionary award scheme, and research successes are compiled monthly and tabled at School Board.

PDRAs. There are 11 PDRAs and a Marie-Sklodowska Curie European Fellow. The School recently hosted an ESRC DTP Doctoral Research Fellow. A Postdoctoral Advisor supports and advises research staff, meeting with them regularly, representing their interests at School committee meetings, and organising workshops and training. PDRAs are included in the PDR process, focusing on their duties within projects and career progression. They also have annual meetings with the Postdoctoral Advisor to discuss their CVs and personal development targets such as fellowship applications. PDRAs in the school have been added as third supervisors for PhD students and a formal policy ensures that they can obtain appropriate teaching experience. This guarantees suitable training, supervision by a member of staff, limited teaching loads, experience of marking their own teaching, and membership of the Board of Examiners. A PDRA committee meets regularly, with a PDRA representative on the School's Research Committee and the University-wide Postdoctoral and Researcher Advisory Group. All PDRAs are full members of our School Board alongside academic staff. In line with the Concordat to Support the Career Development of Researchers (see 3b of Institutional Statement), PDRAs are earmarked 10 'development days' each per year. They can also avail of the recently expanded Postdoctoral Development Centre, which has excellent resources and awards prizes for success; a number of our PDRAs have been nominated for these.

PGR students. Over the REF period, the School has admitted an average of 31 PGRs per annum (11 PhD, 13 Doctoral Clinical Psychology, 7 Doctoral Educational Psychology). Students are recruited from around the globe, with most applying to specific calls for funded projects and a smaller number reaching out to potential supervisors with their own project ideas. Many students are funded by NI Department for Education (DfE) awards, but the School is also now part of the ESRC Northern Ireland and North Eastern (NINE) Doctoral Training Programme, through which PhD students receive funding and training. There has also been success in securing studentships from charities including Leverhulme, Parkinson's UK, Dog's Trust, The Royal British Legion, Forces in Mind Trust, and the Department of Agriculture, Environment and Rural Affairs. Students undertake at least 30 days of formal training during their PhD.

There is a systematic approach to training during students' first year, with PGR students taking compulsory training modules in research planning and skills, quantitative and qualitative research methods and data analyses. Most students take additional modules in qualitative and quantitative methodologies, although they have the option to substitute these with more project-specific training. All of the research training modules run by the School are formally assessed via coursework. Students are also trained in graduate teaching and can take courses provided by the School and the University in career development and professional skills.

Progress monitoring follows a rigorous system specified by the University, with a minimum of ten formally minuted student/supervisor meetings per annum and a panel evaluation at the end of every year. Active engagement in the School's research culture is welcomed, with students encouraged to attend our weekly seminar series. Each academic year, a postgraduate conference is organised by the students. Oral presentations are delivered by students entering their second year, along with invited external speakers, and posters from final year students. During the year, third year PGR students also deliver a research seminar. They also participate in activities such as journal clubs that are organised at the research theme level. Once a year, students organise 'PsychHike', a two-day conference and workshop that combines presentations and seminars with walks in the great outdoors and is designed to encourage the showcasing of research in a relaxed environment. Student opinions are extremely important to the School, with PGR students having the opportunity to discuss any concerns at the Student Voice Committee (SVC) which meets 2-3 times a year. A representative from each year attends and raise any issues identified by their peers.

The co-supervision of PGR students serves as an important way of facilitating interdisciplinary research. Members of staff have co-supervised students with academics in Education on social or developmental issues arising out of the Northern Ireland context, with the School of Politics regarding how we can make people more tolerant in their political attitudes and with the School of Biological Sciences on canine and porcine welfare. Members of staff have also co-supervised students with Medicine and Dentistry, Electronics, Electrical Engineering and Computer Science, the School of Sonic Arts, and the School of Natural and Built Environment.

PGR students benefit from Queen's Graduate School, which provides an intellectual (and physical) interdisciplinary hub. Through its provision of study and social spaces, students from all disciplines mix and participate in events and training to help them complete their PhD and develop their future careers. It also runs a peer mentoring scheme for new students and its own funding scheme that students can apply to in order to support student-led initiatives.

Equality and diversity

In 2014 the School became the first psychology department in the UK to be awarded an Athena SWAN Gold Award; this was renewed in 2017. The Award confirms the School's commitment to promoting equality in relation to gender issues and makes Queen's a recognised leader in equal opportunities in the discipline, as reflected in our beacon activities. The School provides an inclusive and supportive environment for staff and students, many of whom have family or caring responsibilities, and has policies which support flexible needs, and address equality issues.

These include:

- A six-month teaching-free period following maternity leave
- An out-of-hours email policy (no emails sent at weekends or between 7pm and 7am)
- Establishing a Nurture Room for use by parents with infants.
- School family events, e.g., Christmas party for staff and their families
- Devising and implementing good practice for virtual meetings during the Covid-19 pandemic to facilitate those with caring responsibilities

The School is also committed to understanding and addressing intersectionality issues by focusing on issues of race and socioeconomic status (SES); a key aim is, for example, to increase the number of males from low SES schools in our undergraduate and clinical training programmes. We provide staff and students with tailored training in equality-related issue (e.g., LGBT+ issues), and recently set up a new staff-student Racial Inclusivity working group.

The School is committed to using psychological research to address equality challenges, appointing a lecturer with expertise in Gender and Leadership in 2016, who is SWAN Champion and leads on the current EPSRC grant on gender equality initiatives, along with two former SWAN Champions in the School. The same staff member delivers evidence-based workshops on gender related issues in other Schools and universities, consistent with the beacon activity requirements of a Gold Award School.

3. Income, infrastructure and facilities

Overview of research income and strategies for funding

Much of the School's research is facilitated through the development of partnerships with non-academic organisations, and both international and interdisciplinary collaborations. This approach has enabled the School to secure funding from a diverse range of sources. Since 2014, the School has received £7.68M in research income (£233k per FTE). Of this, the largest proportion (£2.9M; 38%), came from UK central government bodies, local authorities, health and hospital authorities (including Department of Health, Public Health Agency, National Institute for Health Research), and from UKRI funders (e.g., AHRC, ESRC, and EPSRC; £2.77M; 36%). £859k (11%) came from UK-based charities (including Cancer Research UK, Forces in Mind, Leverhulme Trust, Nuffield Foundation, Royal British Legion, the Wellcome Trust, and the Templeton Foundation), £483k (6%) came from EU government bodies (including the European Research Council; Special European Union Programme Body), and £307k (4%) came from UK industry (involving a Knowledge Transfer Partnership with Sensum and a Business Alliance Partnership with Aperture IVA). Looking forward, we have several large collaborative research projects due to begin in early 2021: funded by NIHR (£2.6M), Templeton Foundation, (£350k), GCRF Newton (£402k), and UKRI (£115k). Below we outline notable achievements by research theme during the REF period.

Development and Cognition:

- AHRC, two ESRC, and two Leverhulme grants on temporal cognition and its development
- ESRC DTP postdoctoral fellowship for work on temporal cognition and indebtedness

Health Welfare and Clinical Psychology:

- £2M project funded by the National Institute of Drug Abuse to develop treatments for veterans with co-occurring chronic pain and opioid use disorder
- ESRC funding to examine approaches to encourage preventative health behaviours around COVID-19
- Forces in Mind grant to examine the psychosocial determinants of psychological health and wellbeing for Veterans' families in the four nations of the UK
- UKRI grant to develop a biopsychosocial model of PTSD following Armed Conflict in Colombia

Perception and Action:

- Leverhulme Trust grant evaluating the role of context in perceiving the meaning of laughter
- Guide Dogs for the Blind grant to study sensorimotor coordination in young people with visual impairments and investigation of sound-based interventions
- EPSRC equipment grant to update and expand motion capture research facilities
- Fundraising activities resulted in private donations from alumni and special interest groups which were used to research dance-based interventions for Parkinson's disease

Social Psychology:

- EPSRC 'Inclusion Matters' grant examining reactions to gender equality initiatives among academics in engineering and the physical sciences
- Four funded projects to the Social Psychology theme under GCRF calls which support research building capacity in DAC countries, including an ESRC GCRF project exploring how shared education can be applied in divided societies
- SEUPB project evaluating the impact of PEACE IV funded activities on community relations, resilience and confidence among young people in Northern Ireland

Organisational infrastructure and support for research and impact

The School strategy during the REF period has been to provide staff with the time, resources, and academic support and mentorship they need to undertake high quality, impactful research. This is particularly important given the relatively high proportion of ECRs in the School.

School initiatives include:

- a research grant incentivisation scheme, where staff get a % of the value of grant applications, providing them funds for pilot work and other research expenses
- research skills grants, whereby undergraduates receive training and then work as research assistants to build their CV
- regular grant and paper writing retreats and workshops
- an openly accessible repository of successful grant applications
- a research internship scheme for undergraduate students which provides RAs and potential future PhD students
- a peer reviewing mechanism for grant applications
- A weekly School Research Seminar where we invite external speakers, helping to foster collaboration

The School has devoted £270k of its non-pay budget to these initiatives since 2014. In response to the Covid-19 pandemic, we launched an 'Online Research Support Fund', purchased additional software to facilitate online experiments, and set up a support group facilitated by an experienced staff member to help staff with limited experience of collecting data online. A research administrator supports activity around grant applications, including identifying and disseminating relevant funding calls to staff, and arranging in-house training on research matters linked to our grant writing retreats. Where possible, the School also facilitates staff to take a period of study leave every 6 years.

The School recognises that there should not be a 'one size fits all' approach to grant applications, something reflected in the advice we give staff during their annual personal development review. While UKRI grants are highly valuable, it may be more appropriate for a probationary staff member to apply for specific early career calls or smaller grants as PI, while acting as CI on larger grants to gain the experience and track record they need for larger applications as PI. Given the School's vision to be recognised as a leader in applied, impactful, and interdisciplinary research, there is also value in having a diverse funding portfolio, including UKRI, charity and government funding, and being CI on interdisciplinary projects. The School structure facilitates senior PIs preparing collaborative grant applications with ECRs.

The income strategy for the next REF period is threefold. First, we will target funding calls addressing global societal challenges related to mental health and health-related behaviours, and equality, diversity and inclusion, given the expanded research strengths that now exist in these themes. Second, staff will continue to be encouraged to apply for funding with colleagues from other disciplines to address global challenges, particularly in areas where the School already has a strong track record. Finally, the School will work closely with our already strong and growing network of community stakeholders on applied / impact related funding calls. By demonstrating how its research can inform policy and practice on the ground, the School has capitalised on funding sources unique to the region as well as various charities and will continue to build on this success.

Operational infrastructure, facilities and specialist equipment.

The School has developed state-of-the-art facilities funded through external and internal sources to support the research of staff and students. £773k has been invested in equipment in the School since 2014, excluding estates spending on facilities, most notably the new Science in Motion lab. The School has four dedicated technical staff experienced in producing bespoke software, electronic, and mechanical research materials. They also provide support for purchased infrastructure such as eye trackers and physiological recording and analysis kits amongst others. We also have a comprehensive **Test Collection Library** and a **Database of Schools** where research is conducted. Although primarily used by a particular research theme, all labs are bookable by any staff member.

Development and Cognition

- Developmental Laboratory, including an observation room, embedded video cameras and microphones, a waiting area for parents, and children's toilets/baby changing room
- Auditory Processing Laboratory including EEG for children and full sound isolating booth
- Human Experimental (HEX) Laboratory, housing both enclosed cubicles and less formally separated data collection stations all with fully updated computing facilities

Health, Welfare, and Clinical Psychology

- Much of the research in this theme takes place in the field. However, the School is currently developing a dedicated space comprising a suite of private cubicles to undertake assessments and qualitative interviews on sensitive topics, which will be in place by Summer 2021

Perception and Action

- Science in Motion Laboratory. Located at the QUB Physical Education Centre, this 6m x 23m multi-purpose re-configurable lab space is for 3D motion tracking and virtual reality. Together with additional lab space within the School, it houses a large variety of research tools, including motion tracking (Qualisys, Intersense, Xsens, NDI 3D Investigator, Codamotion, Polhemus, EloTouch touch screen, DeepLabCut) and virtual reality (VIVE Pro, Oculus), electroencephalography, posturography (Balance Master), functional near-infrared spectroscopy, force plates (AMTI), sound synthesis, and a range of stimulus presentation systems (e.g., Cambridge Research Systems Visage system, Pavlovica and Psychophysics Toolbox [Matlab])
- The Noldus Observer XT laboratory for collecting, analysing, and presenting observation data, the Optical Oximetry laboratory including Artinis Oxysoft MK3 Near field infrared spectrometer and analysing software, and the EEG Laboratory includes NeuroScan EEG system interfaced with an E-Prime stimulus presentation computer

Social Psychology

- The Social Interaction Laboratory includes sound and visual stimulation of emotion incorporating Microsoft Kinect, 2 Oculus Rifts, and NAO Humanoid Robot

- The Identity and Intergroup Relations Laboratory contains a suite of data collection computers and cameras

The School also has equipment for eye tracking (2 SMI portable eye trackers 125Hz, 250Hz; 60Hz SMI mobile eye tracking glasses; Eyelink 1000Hz eye tracker, VR-ready VIVE Pro Eye), electromyography (BIOPAC), and transcranial magnetic stimulation (TMS; MagStim) that are utilised across research themes. Additionally, it provides software to support research including School licenses for Pavlovia and Qualtrics as well as group licenses including NVivo, Comprehensive Meta-Analysis (CMA), E-Prime, MPlus and JBI Sumari.

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

Located in a provincial capital and therefore in close proximity to the devolved government (see 1d of Institutional Statement for more on the regional and local context), the School has developed outstanding links with the Northern Ireland Executive and numerous government departments. We have, for example, delivered Knowledge Exchange Seminars at Stormont to MLAs and other civil servants to highlight how our research can be translated into policy, and we work closely with a broad range of stakeholders, including Health and Social Care Trusts, Health Authorities, Education Authorities and schools, government bodies, and charities. Crucially, however, we also have high profile collaborations and contribute to society in the wider UK and international context in order to address major global challenges.

Within the UK, CIHRQoL has worked closely with the UK's Public Health Agency and members are part of their Behaviour Change Group which was established in response to the need to support rapid behaviour change, particularly distancing among young people, due to COVID-19. In relation to another global priority, reducing conflict and promoting peace, justice, and humanitarian action in divided societies, CIIR recently gave evidence to the UK Parliamentary Petitions Committee on the importance of compulsory anti-racist education to inform a forthcoming parliamentary debate. Internationally, they have worked with educational and government stakeholders across the Balkans, working together to apply shared education in divided societies.

Academic collaborations and contribution to wider academic community

All of the School's staff have published with external collaborators and most have published with international collaborators. Collaborations include two ESRC projects with colleagues in North America, and GCRF projects funded by AHRC, DoE NI, ESRC and NIHR on promoting positive intergroup relations in divided and contested societies, with collaborators in Bosnia and Herzegovina, Colombia, Croatia, Kosovo, Republic of Macedonia, and Israel. Our involvement in the University's interdisciplinary research centres (see Section 1) has also helped to facilitate international, interdisciplinary collaboration. For example, CIIR is a partner on the interdisciplinary Research Group on Early Childhood Development and Peacebuilding, which has received £1.9M in funds from NIHR.

Engaging with the wider academic community, the School works closely with the British Psychological Society (BPS), co-funding and hosting a large number of annual BPS activities and providing office space and facilities for the BPS Northern Ireland branch, and several members of staff are BPS committee members. We have also been represented on numerous national and international learned society committees during the REF period (e.g., the International Society of Posture and Gait Research, Society for Research on Adolescents), and hosted a meeting of the Experimental Psychology Society in 2017. The School will host two forthcoming events: the European Society for Traumatic Stress Studies conference, a multi-disciplinary meeting of around 850 delegates (June 2022) and the International Society for the Study of Individual Differences conference, with over 300 delegates (July 2023).

Our work is recognised internationally within the wider academic community. Fifteen staff members are journal editors (including current editor-in-chief of European Review of Social

Psychology, and Senior Editor of the Journal of Physiology) and many others sit on editorial boards for international journals. The School has also received a number of prestigious awards. CIIR was part of the research team awarded the 2019 national Queen's Anniversary Prize for its work on using Shared Education to promote positive relations in Northern Ireland; the theme lead was also awarded the 2020 Vice Chancellor's Impact Prize for work around harnessing education to tackling racism. The STARC lead received the 2020 Lord Ashcroft Research Award for innovation in the conduct of research and potential for future impact for research on the health and wellbeing of military veterans. Table 1 provides aggregate data on some of the School indicators of esteem and engagement.

Table 1: Aggregate indicators of esteem, 2014-2020

Indicator of Esteem	Number of Instances
Learned Society Committee Membership	34
External Advisory Board Membership	48
Keynote / Plenary talks	60
Conference Scientific / Programme Committee	74
Conference Chair / Organiser	18
Symposia Chair	50
Journal Editorship	26
Editorial Board Membership	37
Awards, Honours and Fellowships	34
UK Invited talks	80
International invited talks	95
MRes, MPhil and PhD Examination	75
Contribution to Science Festivals and Public Events	65
Consultancy and KTPs	34

Engagement with non-academic communities

In line with our vision around ensuring the international impact of our work, and in line with the University's Engaged Research Action Plan, each research theme has engaged extensively with external research users and stakeholder communities. We are in regular dialogue with our stakeholders, sitting on their advisory panels (e.g., Quality of Life Research, Diabetes UK, and Parenting NI's Dads project). We also offer training based on our expertise, including preparing clinical psychologists to deliver Acceptance and Commitment Therapy (ACT) and giving guidance and training around gender issues in academia and the implementation of SWAN initiatives to academic departments across the UK and to Advance HE. In addition to our collaborations with industrial partners Sensum and Aperture IVA (see Case Studies), we have engaged with a broad range of external partners. This includes funded collaboration with government partners (e.g., the Northern Ireland Education Authority, the Department for Employment and Learning, and the Department for the Economy; Health Education England; Public Health Agency; and various Health and Social Care Trusts), and NGOs (e.g., Alcohol Research UK, Cancer Research UK, Equality Commission NI, and Home Start NI). Below we provide mini case studies that highlight some specific examples of our research engagement from each theme and its benefits for the wider community.

Development and Cognition

- An AHRC-funded interdisciplinary project on time involved extensive engagement with performing arts groups and artists. Workshops were held with Big Telly Theatre Company, Echo Echo Dance, and BBeyond performance art collective. Together with the project team, these groups devised a curated performance evening 'About Time' and delivered it in several arts venues, including Warwick Arts Centre. In this way, some of the research project's work on concepts of time was disseminated alongside the arts performances. The performing arts groups also used the material in their community-

based activities. A cartoonist was commissioned to devise a leaflet that depicted and explained some academic debates about the nature of time in accessible ways; this was launched at the W5 science museum, along with a live drawing event. This arts-based collaboration successfully showcased research project outcomes as well as introducing artists and many members of the public to views about time that are typically only discussed by academics.

Health, Welfare, and Clinical Psychology.

- CIHRQoL works closely with the Public Health Agency and are part of their Behaviour Change Group which was established in response to the need to support rapid behaviour change due to COVID-19. The Centre is leading on research exploring social distancing behaviour in young people, working in collaboration with the University of Ulster, the Dept of Finance, and Youth NI. Outcomes of this work so far include a report for the Public Health Agency with recommendations which will be shared with relevant education and public health stakeholders, and research papers which are currently being written up for publication.
- Working with the knee and hip surgery team at Musgrave Park Hospital, CIHRQoL designed a longitudinal study to examine whether psychological variables (measured pre-surgery) could help to understand variation in physical functioning outcomes up to 1-year post-surgery. The results of this study were published in [The Knee](#). Based on these findings, the surgeons now recognise the importance of addressing psychological variables to improve outcomes, and CIHRQoL has developed a screening tool that will be provided to all patients at the centre. Patients who score above a particular threshold on this screening tool will then be invited to take part in a psychological intervention as part of routine care. The introduction of this intervention is due to be piloted soon.
- STARC delivered the Northern Ireland Veterans Health and Wellbeing project. This programme of research has resulted in presentation of evidence to the Defence Select Committee at Westminster by STARC researchers and recent acknowledgement of the importance of the research during a hearing specific to veteran mental health. As a direct result of the early stages of the programme of research, a new Veterans Support Office (VSO) has been established in Northern Ireland, the role and responsibility of local veterans' champions [renamed from Armed Forces Champions] has been refined and specified, and detailed discussions led by the new VSO have commenced regarding a bespoke veterans' centre (all enacting several of the report recommendations). STARC has fed into consultations on the development of the MOD '[Strategy For Our Veterans](#)'.

Perception and Action:

- The theme is working with people with Parkinson's disease in the local community in collaboration with Parkinson's UK to address balance and falls, important issues for quality of life. The theme actively engages with these groups to inform them about the work and encourage their involvement and input, via regular public lectures to the University of the Third Age and Parkinson's UK groups across NI, documentary screenings, and fundraising events. Utilising an Impact Award from Parkinson's UK, the theme has designed and evaluated two dance interventions for people with Parkinson's Disease at the Queen's Physical Education Centre. They showed improvement in motor symptoms and improved quality of life (see [video testimonials](#)), and with support from the University's Impact Fund and Sport NI, they still run twice a week, continuing online since the start of the COVID-19 pandemic.

Social Psychology

- CIIR is currently undertaking a longitudinal study for the Special European Union Programmes Body examining the impact of PEACE IV projects across Northern Ireland which aim to promote psychological resilience and positive cross-community relations

among vulnerable young people. Initial results are positive, and recommendations have helped to fine-tune these youth projects to ensure maximum effectiveness.

- Given the recent death of George Floyd and the Black Lives Matters campaign, understanding how we can promote a more inclusive and equal society has been a matter of enormous public and political interest. The CIIR lead delivered the 2019 British Academy / British Psychological Society Annual Public Lecture on promoting confidence in contact in a diverse world, and was part of the team that delivered 'The school that tried to end racism', a 2020 Channel 4 documentary which received extensive media coverage, including an [interview](#) on ITV's Good Morning Britain and an article in The Times' [Saturday Magazine](#). It also led to a panel event attended by MPs and Members of the House of Lords, and an invitation to give evidence at a joint session of the Petitions Committee, Women and Equality Committee, and Education Committee.

Wider impact on non-academic world and communities

A number of staff have received GCRF support for cutting-edge research that addresses the challenges faced by developing countries. Work on education in divided societies is in line with the GCRF Challenge Human Rights, Good Governance and Social Justice, and in particular the need to reduce conflict and promote peace, justice, and humanitarian action. Research with the Public Health Agency and Alcohol Research UK encouraging positive parenting and improving outcomes for families was in response to the NI Delivering Social Change initiative. The School is involved in the development of an academic paediatric cardiology department for NI, which is part of an all-Ireland initiative to improve health care for children with heart disease. Ongoing work around drinking behaviour and addiction addresses public health guidance 24 which emphasises the pressing need for research to identify which screening tool should be considered as the 'gold standard' for assessing the drinking behaviour of under 18s.

The way in which the School has nurtured and grown non-academic partnerships has resulted in tangible research impacts. These include numerous government reports based on our recommendations, for example the Physiological Society Policy Report 'Growing Older, Better' in response to the UK government's healthy ageing mission, and the Independent Report on Integrated Education commissioned by the Northern Ireland Executive, which included expert testimony from the CIIR led. We also produced reports in response to the COVID-19 pandemic, including BPS Disease Prevention guidelines on how to stay healthy during the crisis.