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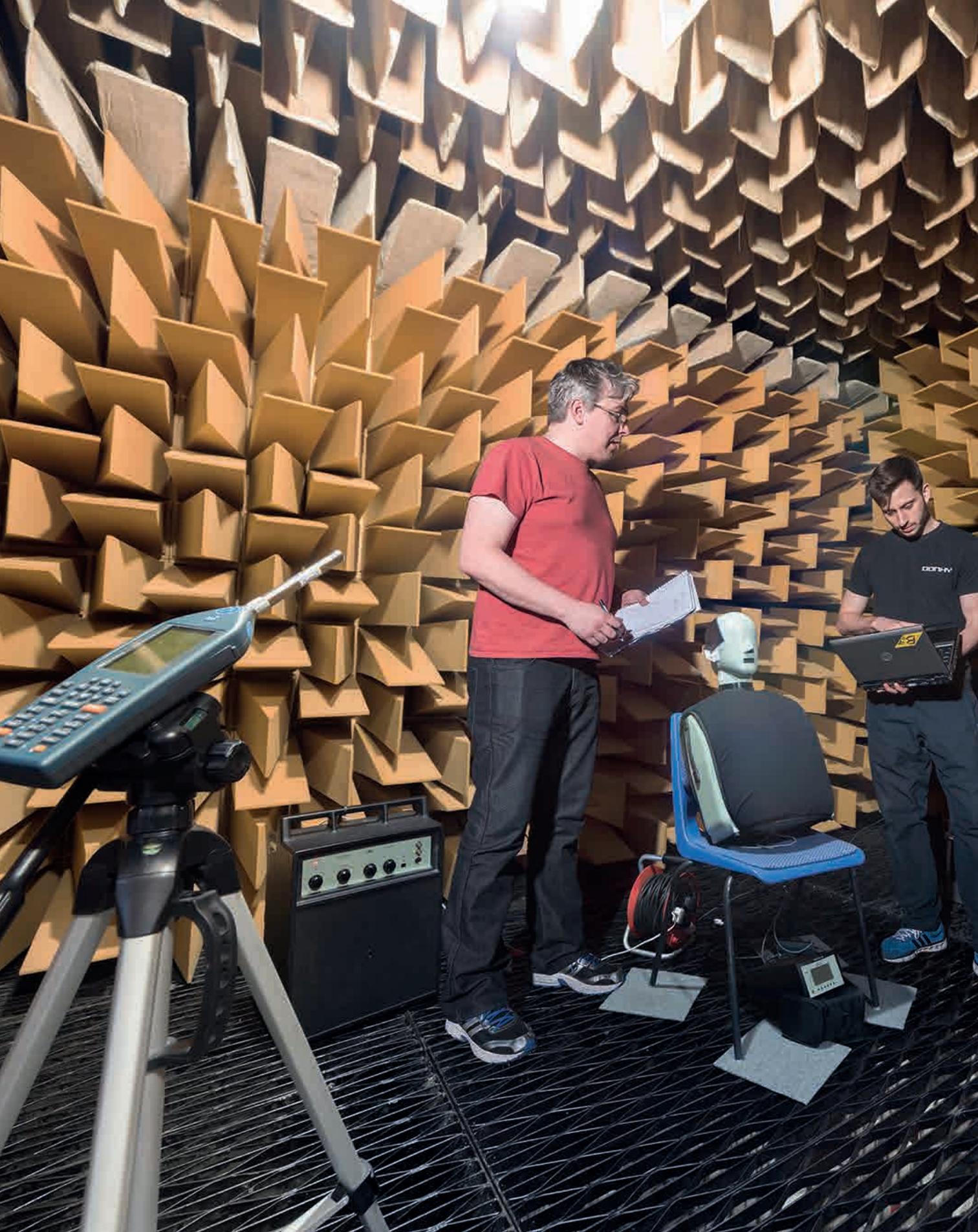
Research,
Enterprise &
Innovation



Our Research

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Introduction

This booklet, assembled in the summer of 2018, showcases some of the real-world focused, internationally impactful research London South Bank University's academics are currently delivering across multiple domains, including health, cloud computing, science and engineering, entrepreneurship, equality and diversity, international development and the arts.

These case studies demonstrate the highly applied nature of our research. We work closely with industry, business, community and government partners, providing the high-quality research they need to flourish. In turn, these external links enhance student success, providing an industry-standard learning experience, ensuring that students have the knowledge and skills that are attractive to employers today and in the future.

In 2017, in support of our research mission, we established our Research Centres and Groups. Centres drive our leading edge, internationally esteemed research and Groups provide an inclusive research culture and catalyse peer-to-peer knowledge sharing. Together, these core elements of our research strategy deliver a supportive and focused environment for achieving our research mission: to address the major, global challenges faced by society.

Through this publication we want to share with you some of the high-impact research underway at London South Bank University and especially, celebrate the individuals and Research Centres who are dedicated to driving tomorrow's research agenda and delivering research with outstanding societal and cultural benefits.



Professor Paul Ivey
Chief Business
Officer, Deputy
Vice-Chancellor for
Innovation

From grass-roots activism to political representation

Research that delved into the under-representation of minority ethnic women in local politics now aims to reverse the pattern by creating pathways for change.

Background

Within the UK, women have long been under-represented in local politics. This issue is especially acute for minority ethnic women. Their engagement in politics is vital both for the health of local democracy and to ensure that the decisions made on the behalf of local communities take into consideration all sections of the electorate. Local government spends £94bn each year and current trends in devolution will see an increasing shift of power and decision making to the regions. Women are more likely to rely on the services that councils provide, so their representation in decision-making positions is vital.

The research

Associate Professor in Sociology, Dr Shaminder Takhar, has a longstanding research interest in issues pertaining to race, gender, sexuality, education and social justice, which led to her PhD in 2003 on minority ethnic women and the Construction of Political Identity. In 2011/12 she researched the under-representation of minority ethnic women in UK local politics and in 2013 her book *Gender, Ethnicity and Political Agency* was published. This led to an invitation to sit as a commissioner on the Local Government Commission and the Lambeth Equality Commission, and her contribution to the final report from both Commissions titled *Does Local Government Work for Women* (2017) and Lambeth Council's Equality Commission Report (2017).

"As a member of the Local Government Commission, I am keen to see our recommendations put into place at all levels," explains Dr Takhar. "We know that a

recommendation is not obligatory, but it is a meaningful instrument to engage political parties to instigate change at policy and structural levels, and monitor that development. When the recommendations are taken up and acted on, the result will be more women involved in local politics."

"It is striking that the experiences of women councillors are very similar, regardless of the political party they represent," Dr Takhar adds. "Election of women at any level of politics is an important development for all societies, but it has been acknowledged that female politicians continue to face difficulties before and after being elected to office. These challenges include institutional practices/bias, selection on the basis of background and ethnicity, electorate response and political party ideology. At heart though, the participation of women in politics is crucial to addressing gender inequality in all societies."

"Election of women at any level of politics is an important development for all societies, but it has been acknowledged that female politicians continue to face difficulties before and after being elected to office."

Moving forward, the plans are to apply for a larger grant that would allow Dr Takhar to undertake a survey of councils nationwide. This would provide comprehensive and robust data on intersectionality (gender and race) that is not limited to minority ethnic women's participation in local politics.

Researcher: Dr Shaminder Takhar
Research Centre: Centre for Social Justice and Global Responsibility
School: School of Law and Social Sciences

Creating pathways for change for minority ethnic women

Impacts

- Dr Takhar's work has been referenced in a report produced in New Zealand for the Glenn Inquiry: Toward a transformed system to address child abuse and family violence in New Zealand.
- Dr Takhar was invited to sit on the Local Government Commission and contributed to their 2017 report: *Does Local Government Work for Women?*
- Dr Takhar is also a commissioner with the Lambeth Equality Commission, which is working to reduce the barriers that a number of its constituent communities face in surmounting health, education and employment challenges. In 2017 it produced a major report which identified these barriers and proposed how they could be overcome.

Noises off: sounding out and preserving the hearing of our leading musicians

Largest known study of its kind reveals the reasons for classical musicians' hearing issues and helps introduce safer working practices to combat the risks.

Background

Hearing loss is an understandably serious concern for classical musicians and the risks are usually greatest for orchestral players. This was highlighted recently when the Royal Opera House (ROH) lost a High Court case concerning hearing damage incurred by a musician in their orchestra pit.

There has, to date, been a lack of detailed understanding regarding both hearing loss in classical musicians and interventions to protect hearing. The overriding concern in both conservatoires and performance venues is that any solution does not compromise artistic excellence. As such, solutions need to be invisible.

With this issue in mind, Associate Professor of Acoustics, Dr Stephen Dance, has been undertaking research on hearing loss amongst classical musicians, with the aim of developing solutions that do not compromise artistic excellence.



The research

“Since 2007, the Acoustics Group at LSBU has been working with the classical musicians of the Royal Academy of Music,” says Dr Dance. “Under my leadership, the group has built on the achievements of emeritus Professor Bridget Shield to conduct the largest known longitudinal study of musicians. We have worked with 3,500 musicians, testing 300 students every year. In 2009 the longitudinal study expanded to encompass the London Philharmonic Orchestra, while more recently the group has collaborated with the Royal Opera House.”

The key finding to date is that musicians are protected from hearing damage where the noise source is the instrument that they themselves are playing, although this does not hold if the instrument is amplified. Improving the environment for musicians is therefore key to delivering a safe working space.

Dr Dance has been working with Henry Wood Hall and the Royal Opera House on designing and implementing a better acoustic for the benefit of performers. “Reducing risk is key and so we are now trialing a new application for a type of hearing protection called Sonic 2 Shooters,” he explains. “These are designed to protect against gun fire, which is a common occurrence in operatic finales, whilst still allowing the singers to perform.”

Building on the extensive body of knowledge developed in the past ten years and the continuing audiometry work at the Royal Academy of Music, a consortium is now being put together, involving the Association of British Orchestras, to respond to the High Court ROH judgement. Further, a new EU Hearing Protection Group is in development. With regards to new devices, Dr Dance and his team are currently working on a wireless sound badge combined with a conductor information system.

“This is a multidisciplinary area of research involving audiology, acoustics, electronic engineering and computer

science. The idea of significantly, but imperceptibly, changing the environment is key to helping these extremely talented people,” concludes Dr Dance.

Researcher: Dr Stephen Dance

Research Centre: Centre for Civil and Building Services Engineering

School: School of the Built Environment and Architecture

Impacts

- Dr Dance is now Chair of the Institute of Acoustics' Musical Acoustics Group. He is also the EPSRC UK Acoustic Network lead for the special interest group for Rooms, Communication, Music, Hearing and Speech.
- Between 2009 and 2018, the acoustics of Henry Wood Hall were improved using interventions, the design and implementation of which were informed by the research of Dr Dance and his team.
- Dr Dance and his team have collaborated with the Royal Opera House, forming the Performance Sound Management Group. This has resulted in a better space for choristers to rehearse, assisted the health and safety team with singing and loudness challenges and, through a jointly funded PhD scholarship, improved the environment for orchestra.
- The collaborative scholarship has produced an entirely new type of sound diffuser to be installed in the orchestra pit.
- A new immersive virtual reality system was developed to demonstrate to the musicians and the Royal Opera House the change in the sound of the orchestra pit when the diffusers are installed.
- In collaboration with the BBC, Dr Dance and his team assisted in the production of two guides: Music, Noise, and Hearing Part I and Part II.

Putting fridge fires on ice

Study identifies failure modes and fire spread mechanisms for UK domestic fridge-freezers, in an effort to avoid further tragedies such as Grenfell.

Background

Fridges and freezers have been estimated to cause approximately 300 domestic fires a year in the UK. A number of these incidents have resulted in injuries or fatalities and produced significant levels of property damage. Indeed, a fridge-freezer is suspected to have been the initial cause of the Grenfell Tower fire disaster.

As a result, it is important to analyse such incidents to examine their characteristics and understand the underlying ignition and fire spread mechanisms and how they might be mitigated.

The research

London Fire Brigade (LFB) first set up a dedicated fire investigation team in 1983. Since then specialist fire investigation officers have assisted the incident commander in determining the origin and cause of a fire. As an LFB Fire Investigator, LSBU PhD student Mick Beasley has a wealth of experience on the topic of domestic appliance fires.

Mick's PhD research project with LSBU is investigating the causes, consequences and prevention of fires in domestic refrigeration systems. "Mick's central thesis is that the design of modern refrigerators in the UK is promoting flame spread and exacerbating the potential consequences of any fire, both in terms of the severity or damage and the number of casualties", says Senior Research Fellow Paul Holborn.

Through the recording of details from fires over previous years, LFB fire investigation data has provided access to the specifics of many case histories for incidents involving domestic refrigerators. Many of the incidents have yielded

samples that have been examined by forensic scientists. Mick has used this information to identify possible ignition and fire spread mechanisms in fridges and freezers.

Part of the research also involved regular visits to local authority recycling yards to examine refrigeration appliances. The condition of a number of appliances was examined, recorded and provided insight into possible ignition mechanisms.

"Analysis of incidents suggests that fires caused by fridge-freezers exhibit a higher degree of fire spread than any other types of appliance."

"Analysis of incidents suggests that fires caused by fridge-freezers exhibit a higher degree of fire spread than other types of appliance", Paul adds. "There is also evidence to suggest that the severity of refrigeration fires in the UK is significantly higher than in the USA. This can be attributed to firstly, a combination of components that can fail and act as an ignition source and secondly, these components being located in close proximity to an extensive source of flammable material."

Through his research, Mick has identified a number of common failure modes leading to ignition as well as specific fire escalation and spread mechanisms, which contribute to the fire growth that can occur in domestic refrigeration appliances. This information, coupled with a comparison of refrigeration appliances in the UK and USA, has been used to propose a number of design measures to be used by manufacturers to significantly reduce the risk of fire, such as using non-combustible metal backing at the rear of fridge-freezer appliances.

Researcher: Paul Holborn

Research Centre: Energy and the Environment

School: School of Engineering



Impacts

- Mick's 2017 March Institute of Refrigeration conference paper was the topic of significant debate in relation to the revision of BSI standards on domestic appliances: the research is poised to influence fridge/freezer safety legislation.
- Under Dr Holborn's supervision, Mick has identified specific failure modes and fire escalation mechanisms.
- Mick proposed a number of design changes which could be used by manufacturers to significantly reduce the risk of domestic refrigeration fires.
- Mick was part of the London Fire Brigade team looking at the cause of the fire at Grenfell Tower.

The smoking gun: electrifying

smoking research policy

World-leading research on the effects of vaping is helping shape international government policy on one of the world's fastest-growing industries.

Background

Electronic cigarettes emerged in the late-2000s as an alternative to conventional cigarettes. Growth in their usage has been rapid, and today the worldwide market is worth billions. Understanding of their effects on health, smoking cessation and addictiveness has, however, been limited. Legislation on their usage is, therefore, often misguided due to fallacies and myths about their harms.

The research

In a previous role at the University of East London, Professor Lynne Dawkins coordinated the Drugs and Addictive Behaviours Research Group. Whilst there, the emergence of e-cigarettes led to a new line of research for her, which culminated in her co-leading the first survey of European e-cigarette users, as well as several lab-based studies.

After joining LSBU in 2016, Associate Professor Lynne Dawkins became a key member of the Centre for Addictive Behaviours Research. Her research (funded by Cancer Research UK [CRUK]) has focused on understanding how nicotine content influences the degree of intensity with which a user inhales. She has found that for a low-nicotine e-cigarette, you have to puff harder, and for longer, to get the same hit as a high-nicotine e-cigarette, which can increase exposure to harmful substances in the vapour. This has major implications for regulatory decision making both in the EU and globally.

“Because the industry is new and has grown so quickly, one of the main challenges is trying to keep up-to-date with a rapidly changing environment,” she says. “E-cigarettes have seen an unprecedented growth and evolution. As a result, it is hard for research studies, which involve a lengthy process of gaining funding, ethical approval, data collection and analysis, to keep up with these changes.”

“We have conducted a small study already on the effects of the EU Tobacco Products Directive health warnings on e-cigarette packs, which formed the basis for a CRUK-funded project on health warnings.” More recently, Lynne has also secured funding from the Public Health Research Board at the National Institute of Health Research for a feasibility study to explore the effects of providing e-cigarette starter kits to smokers accessing homeless centres. This collaboration with Stirling University, Queen Mary, University of London, University of York and Kings College London involves working with the homeless

charities St Mungo's, the Salvation Army and the Hope Centre. There are also plans to explore how best to support smokers attempting to stop smoking through using e-cigarettes purchased online. This study's intervention, through being internet based, could potentially be highly scalable.

Researcher: Dr Lynne Dawkins

Research Centre: Centre for Addictive Behaviours Research

School: School of Applied Sciences

Impacts

- The research, through informing various reports, is helping to shape the e-cigarette landscape, and is likely to affect future EU policy decisions.
- Professor Lynne Dawkins has given evidence to the EU enquiry into the Tobacco Products Directive (which subsequently defined allowable nicotine strengths in e-cigarette liquid and labelling policy across the EU).
- Lynne has presented her findings to Brazilian and Philippine senators and members of congress, informing legislative and regulatory approaches to e-cigarettes in these countries.
- Lynne is an adviser to the Institute and Faculty of Actuaries' working party on the effect of e-cigarettes on insured lives in the UK.
- Lynne spoke to the House of Commons (Science and Technology Committee) on 27 February 2018, commenting on issues relating to the toxicity of e-cigarettes and how puffing behaviours, device settings and other factors may affect the toxicity.
- Lynne has acted as an expert witness in a number of legal trials involving patents around e-cigarettes.
- Lynne has won grants from both Cancer Research UK and the National Institute of Health Research.

In it together – a shared endeavour: Helping autistic people to thrive through participatory research

The Participatory Autism Research Collective brings together autistic people, researchers and practitioners to share knowledge and expertise and produce a step-change in inclusive, autism research.

Background

Over the past two decades there has been a sea-change in the public understanding of autism, which is now widely recognised as something associated with a different way of thinking. There is increasing public understanding that, whilst some autistic people have intellectual impairments, others are very intellectually able. Autistic people still, however, encounter barriers within a society created by non-autistic people.

Involvement of autistic people in the workforce remains low, with only 15 per cent of people diagnosed with autism in full-time employment, even though many are highly qualified. Moreover, despite the stereotype of the ‘Asperger’s professor’, autistic people are still broadly under-represented in academia.

The research

To help illuminate and mitigate the barriers faced by autistic people, after joining LSBU in 2013, Professor Nicki Martin, along with her colleague Dr Damian Milton, quickly established the Participatory Autism Research Collective (PARC). Professor Martin has a long and extensive track record in working to improve educational and employment prospects for autistic people. Her PhD focused on inclusive practice with autistic university students, and while at Sheffield Hallam University she was Director of The Autism Centre.

“PARC brings autistic people, including scholars and activists, together with early career researchers and practitioners who work with autistic people. Our aim is to

build a community network that facilitates the significant involvement of autistic people in autism research and the sharing of their knowledge and expertise,” says Professor Martin.

“Although autistic people have much to offer autism research and are uniquely placed to provide insider perspectives they are often, however, poorly paid or not paid at all for their expert contributions. PARC operates out of The Critical Autism Disability Studies Research Group (CADS) which ensures that PARC members are not

“PARC brings autistic people, including scholars and activists, together with early career researchers and practitioners who work with autistic people.”

exploited in this way. Finding ways, however, to make sure this happens more widely is certainly one of our biggest challenges.”

More recently, two key activities of CADS featuring PARC members have involved research into the efficacy of mentoring with autistic people and the experiences of disabled leaders in higher education. PARC members acted as advisory group members for the mentoring project. “Mentoring is one strategy to address obstacles autistic people may encounter,” explains Professor Martin. In terms of other activities, the second Critical Autism Studies Conference took place in July 2018 and PARC events have been held throughout the year.

Researcher: Professor Nicki Martin

Research Centre: Centre for Social Justice and Global Responsibility

School: School of Law and Social Sciences

Impacts

- PARC was a finalist in the 2017 Autism Professionalism Awards and there are now PARC groups across the UK.
- The mentoring research has resulted in CPD Standards Office accredited CPD which has been delivered across the UK mainly to university staff working with autistic students.
- PARC coordinated a seminar series in the Autism Show 2018, which was held in three UK cities.
- PARC coordinated a seminar series in the Learning Disability Show 2018, which was held in London.
- Collaborations beyond the UK have resulted in PARC groups being developed in Europe and America.
- PARC members have contributed to three special edition journals edited by Damian and Nicki in 2017-18.
- The disabled leaders project has been presented at two national conferences and one international conference this year.



Healthier outcomes for the many: Co-producing kidney care research with patients and the public to deliver benefits for all

Patient engagement and involvement is at the heart of this innovative programme of research aiming to help people with chronic kidney disease self-manage their condition.

Background

Chronic kidney disease (CKD) is a long-term condition often caused by other diseases, such as diabetes mellitus and high blood pressure. CKD affects around six per cent of the adult population. There are up to 45,000 premature deaths in the UK every year due to CKD. In order to reduce these figures, it is vital that people with CKD have a full understanding of their condition, and are fully engaged in their management and effective care. Effective research is needed into understanding how people can be fully engaged in preventing kidney function decline via effective self-management.

The research

Professor of Kidney Care, Nicola Thomas, was awarded the first joint British Renal Society/Kidney Research UK Fellowship: this funded her doctoral research, which she completed in 2010. For her PhD she worked with patients and primary care professionals to develop and test a self-management package for people with diabetes at risk of kidney disease. Since then Professor Thomas has become involved in a number of initiatives that have developed innovative educational materials for self-management of kidney disease, including the award-winning East London Community Kidney Service.

“During my doctoral research, my interest in involving people who have kidney disease in both their care and in research burgeoned. As a result, I developed the Kidney Research User Group at LSBU, alongside the People’s Academy,” she explains. “The aim is to involve people

with experience of kidney disease in every aspect of the research process.”

“The aim of this research is to involve people with experience of kidney disease in every aspect of the research process.”

Between 2014 and 2016, Professor Thomas co-led a collaborative project with East Kent Hospitals University NHS Foundation Trust and Barts Health NHS Trust on the experience of older people in the shared decision-making process in advanced kidney care. A key innovation of this study was involving patients and carers in every aspect of the research process: this approach is called ‘co-production’.

“As health care clinicians and researchers, it’s important to involve the patients, their carers and the public throughout any research process. This gives me a chance to understand where their research priorities lie, and can improve the research experience for participants.”

“Not all researchers understand the benefits of involving patients and carers in the research process: often they do this in a tokenistic rather than a meaningful way. To improve upon this and build on the work LSBU has already conducted, I have a number of active studies that involve people in the research design, including supervision of a doctoral study where young people with kidney disease are involved in formulating the research question.”

Researcher: Professor Nicola Thomas

Research Centre: Centre for Applied Research in Improvement and Innovation (CApRII) in Health and Social Care

School: School of Health and Social Care

Impacts

- Awarded the Donna Lamping Award in 2018 by the British Renal Society for outstanding research in kidney care.
- Nicola was the first UK nurse to be a Professor of Kidney Care.
- Awarded a lifetime award by the European Dialysis and Transplant Nurses Association/European Renal Care Association for “outstanding contribution to the Association and advancement of renal care in Europe”.
- Contributed to a number of initiatives that have developed innovative educational materials for self-management of kidney disease, including the award-winning East London Community Kidney Service.

Future-proofing public service broadcasting: embedding people, values and digital processes

Research study is highlighting the importance of partnership working for public service media to adapt to an increasingly data-driven landscape.

Background

For public service broadcasters such as the BBC, digital technology presents both a threat and an opportunity. The opportunity is the increased reach that the internet provides, especially in terms of allowing users to access content at their convenience. The rise of content providers

such as Netflix and YouTube does, however, create greater competition and pressure to remain visible and current, particularly with younger audiences.

The research

Professor Lizzie Jackson has a formidable track record in media production and media research and in 2012 she co-wrote the EU Declaration and Recommendation on Public Service Media Governance. The principal recommendation was that public service media should not limit its activities to television and radio but rather, it should encompass all media channels. Her involvement in this EU declaration

spurred her three-year study Public service media: people, values and processes, which yielded, via her collaboration with Dr Michal Glowacki from the University of Warsaw, the largest grant ever given in Poland for a media study.

Professor Jackson and Dr Glowacki are now researching the organisational culture of high-tech media clusters in ten cities in North America and Europe. Initial findings indicate the importance of partnership working for public service media in order to accelerate adaptation to an increasingly data-driven media landscape.

“The study is generating a very large data set of over 150 interviews, and is surveying ‘grey literature’ of around 90 documents such as annual company reports and city strategies,” Professor Jackson says. “We are also analysing 500 photographs from the ten cities generated by ‘walkabouts’ gathering ethnographic data.

“The study is generating a very large data set of over 150 interviews and is surveying ‘grey literature’ of around 90 documents such as annual company reports and city strategies.”

“Dr Glowacki and I will be closely involved in the European Broadcasting Union’s Media Road project, a new initiative to encourage collaborative R&D. I will also begin to look at the potential usages of big data and the blockchain in the public service media sector. Further, I am in the process of establishing links with the BBC and audience advocate groups in the UK to implement the findings of our research.”

Researcher: Professor Lizzie Jackson

Research Centre: The Centre for Digital Storytelling

School: School of Arts and Creative Industries

Impacts

- After observing a workshop at LSBU run by Professor Jackson on scoping the BBC of the future, the BBC’s Digital Audience Insight Manager subsequently decided to commission a 1,000-participant study looking at Generation Z’s media consumption habits.
- The former Director General of the Danish Broadcasting Corporation, Christian S Nissen, is engaged in complimentary research on big data and the media, and he and Professor Jackson have agreed to share findings.
- Professor Jackson has been invited to partner in the European Broadcasting Union’s Media Road project to encourage collaborative R&D.
- Professor Jackson gave the keynote speech at the June 2018 European Media Managers Association annual conference.
- The former Head of the Diversity Action Plan at the BBC, Elonka Soros, will be undertaking a doctoral study with Professor Jackson from October 2018.
- Through her research, Professor Jackson has become an adviser to the UK Intellectual Property Office, sitting on their Research Advisory Group.
- Professor Jackson sits on the Committee of Electronic Visual Arts, London.
- Professor Jackson has been invited to work with the audience group the Voice of the Listener and Viewer to look at future forms of funding. This will investigate the use of blockchain technologies to set up peer to peer ‘SMART’ contracts with the public for payment and the collection of value and sentiment.



Travelling bright: potential of

This novel project is aiming to assess the challenges and opportunities for refugees and displaced persons to become entrepreneurs, and to remove the barriers that prevent them from doing so.

Background

Becoming an entrepreneur is invariably a demanding and high-risk activity, but the challenges are compounded when one is displaced. A typical barrier might be a lack of confidence in communication, especially when one is conversing in one's second, third or even fourth tongue. Negotiating the complex legal and legislative business framework of one's adopted country is another key challenge.

The research

Since 2013, Cherry Cheung, Senior Lecturer in Corporate and Business law, has been engaged in research on developing a culture of entrepreneurship amongst vulnerable groups. Recently, she has become increasingly involved in research on entrepreneurship amongst refugees and other displaced peoples. In 2018, she began a collaboration with colleagues from the University of Essex, Loughborough University and the Hague University of Applied Science/Leiden University College to develop a one-day, bespoke training camp for aspiring refugee entrepreneurs, through an ESRC impact grant administered by Essex University.

"The objective is to provide participants with the ability and confidence to develop a business model, employ social media and advanced marketing techniques and consider viable legal formats for their business," says Cherry. "They will also work on a financial plan, and look for funding and partnerships to support them in taking their business to the next level."

realising the enterprise refugees and displaced persons

"As a lecturer in corporate and business law, my role is to work with refugees on the legal aspects of their business. In the camp, I will discuss with them some of the key issues affecting businesses, and talk directly with them about their specific business concerns."

"In the camp I will discuss with them some of the key issues affecting businesses, and talk directly with them about their specific business concerns."

Cherry says that one of the main challenges of this activity has been finding relevant refugees to attend the workshop. However, by connecting with a Syrian refugee, who was a research student of one of Cherry's collaborators, they were able to draw from his personal network and charities he worked for.

"Alongside the practical workshop, I am also working with teams in Pakistan and Bangladesh to explore the challenges that displaced entrepreneurs faced in starting a business, with some of the work already published as academic research and further publications in development."

In terms of looking ahead, the team plans to carry out research to evaluate the workshop's effectiveness. "We shall talk to the participants to find out how they feel about the training camp, and how we can improve our future delivery," Cherry adds. "We will then, based on their feedback, revise our content for future projects in development. We will conduct follow-up discussions with the participants three months after the workshop to see if they have eventually started a business, and to find out what more we could have done to support them."

Researcher: Cherry Cheung
Research Centre: London Centre for Business and Entrepreneurship Research
School: School of Business

Impacts

- LSBU academic Cherry Cheung is collaborating with colleagues from the University of Essex, Loughborough University and the Hague University of Applied Science/Leiden University College to develop training for refugee entrepreneurs.
- The project has created a bespoke training camp for aspiring refugee entrepreneurs.
- The research on entrepreneurship in the war and conflict context, alongside other work, has already yielded co-authored outputs including one book chapter, two journal articles and a number of working papers for future submissions.
- Cherry is working with teams in Pakistan and Bangladesh to explore the challenges that displaced entrepreneurs face.

Getting ahead in the cloud: Creating a secure virtual environment for critical infrastructure management systems

LSBU researchers are playing a key role in ensuring that some of the critical systems that keep us safe remain safe and secure from harm themselves.

Background

Supervisory Control And Data Acquisition (SCADA) systems are industrial control systems used to monitor critical infrastructures such as airports, transport, health and public services of national importance. They have a vital role to play in ensuring that our travel network and airports run smoothly. However, there is an increased need to run these services not on local servers, but on the cloud, which can increase data vulnerability.

The research

Firstco are an Engineering Consultancy with a high level of involvement in underground rail projects and an impressive track record in the communication and control infrastructure market. In 2015, Professor Shushma Patel, together with her colleague Professor Dilip Patel, successfully secured a Knowledge Transfer Partnership (KTP) with Firstco to research cloud-hosted (virtualised) SCADA systems.

“The focus of our work was to investigate and understand potential threats to the increasingly open SCADA systems, as well as virtualisation of Firstco’s technologies and platforms to increase their presence in the lucrative market of process control in the transportation industry,” explains Professor Shushma Patel.

“At the outset of the project in 2015, Firstco were clear that for them to win new customers, they had to use

virtualisation techniques to demonstrate their SCADA tools to potential clients.”

The KTP associate hired for the project, Dr Sajid Nazir, worked with the two professors to develop knowledge about the virtualised SCADA systems in secure environments, and this work then directly informed the work of Firstco and their clients at Heathrow.

“The outcomes have been really positive and the team is currently active in advancing research in this area and the dissemination of our findings in publications.”

“The virtualisation initiative led to us incorporating video and voice into the virtual SCADA system and to focus on security threats to critical national infrastructures,” adds Shushma.

“There were some challenges involved such as scoping complex scenarios and ascertaining how to incorporate cognitive computing technologies for predicting potential cyber threats, especially where there were limited datasets. The outcomes have been really positive though, and the team is currently active in advancing research in this area and the dissemination of our findings in publications.”

Researcher: Professor Shushma Patel

Research Centre: Biomedical Engineering and Communications

School: School of Engineering

Impacts

- Professors Shushma and Dilip Patel secured a Knowledge Transfer Partnership (KTP) with Firstco to research cloud-hosted (virtualized) Supervisory Control And Data Acquisition (SCADA) systems.
- Firstco are involved in SCADA systems at Heathrow and Stansted airports and on the London Underground: indeed, a range of infrastructure systems use SCADA to manage and control their operations. The LSBU team succeeded in integrating voice and video media into the system as well identifying both SCADA systems’ vulnerability and potential security solutions.
- A key outcome has been that Firstco was successful in winning the contract for the new SCADA system for Heathrow Airports Baggage Handling System. This system is a virtualised SCADA system that will be rolled out across all the baggage factories at Heathrow airport.

One giant leap: TEMULAB – development of a diagnostic device for the prevention of Achilles tendon injuries

A new diagnostic device, developed from pioneering biomechanical research, will help prevent Achilles tendon injuries in everyone: from elite athletes to amateur walkers.

Background

The Achilles tendon, which attaches the calf muscles to the heel bone, is the thickest tendon in the human body. It plays a crucial role in all of our leg motions, enabling us to walk, run and jump. Achilles tendon injuries, which can range from mild strain to complete rupture, can have a devastating effect on mobility and performance, with long recovery times often required and surgery needed in some cases.

The research

Professor Kiros Karamanidis and colleagues began investigating the mechanical properties of tendons over 15 years ago, with the aim of understanding how the tendon's condition would influence the probability of injury and sports performance. Through this work, they developed an accurate, non-invasive method of measuring tendon stiffness and muscle strength.

“There is known to be a relationship between the stiffness of the Achilles tendon and the strength of the calf muscles that it connects to,” explains Professor Karamanidis. “It is believed that injuries occur where there is a discordance in this relationship, which may be caused by differences in the timeframe in which muscle and tendon adapt to and recover from training. The knowledge about this relationship is still poor, as evidenced by the relatively high frequency of Achilles tendon injuries in elite as well as recreational athletes.”

Professor Karamanidis was approached by a company to commercialise the knowledge he and his team had developed and so, in 2014, PROTENDON® was formed and TEMULAB® (Tendon-Muscle-Laboratory) developed. In 2017, Kiros joined LSBU and working with colleagues, he has gone on to make further advances, including in vivo muscle architecture analysis and activation deficit.

“We would like to establish our muscle-tendon lab at the London Marathon, with the slogan Check Your Tendon. This will help prevent Achilles tendon injuries in recreational adult marathon runners of all ages.”

“We are currently negotiating to start similar collaborations with several big federations in Britain, such as UK Athletics, in order to provide a research service to analyse and monitor muscle and tendon adaptation,” says Professor Karamanidis. “This would enable coaches and physiotherapists to track the condition of elite athletes to help avoid injuries and problems with tendinous tissues. In addition, we would like to establish our muscle-tendon lab at the London Marathon, with the slogan Check Your Tendon. This will help prevent Achilles tendon injuries in recreational adult marathon runners of all ages and in particular, middle-aged runners who have the highest risk of tendon injury and chronic tendon pain.”

Researcher: Professor Kiros Karamanidis
Research Centre: Sport and Exercise Science Research Centre
School: School of Applied Sciences

Impacts

- In 2015, Professor Karamanidis and colleagues were the IAT Sports Technology Award winners for the development of TEMULAB®.
- In 2016, they were awarded €110k from the German Federal Institute of Sports Science to evaluate elite level jumpers in the German Athletics Federation. Within one year, 72 athletes were monitored on a regular basis and in that time, there were no reported incidents of Achilles tendon injuries. When discordance between muscle and tendon was detected, the team was able to undertake an objective mechanical analysis of the muscle-tendon unit within 15 minutes and send a report to the athlete's coach/physician, enabling a rapid intervention.
- In 2016, the technology was implemented in the German Football Association as part of regular team preparation diagnostics.
- Professor Karamanidis and colleagues have published in excess of 35 peer-reviewed papers in the area of muscle and tendon mechanical properties.

Climate Change Displacement: Migrating to a new model for urban resilience

This vital research study is aiming to help Sudan develop long-term, city-level resilience action plans, to fight the disastrous consequences of climate change and conflict.

Background

The disastrous impact of climate change on urban livelihoods and natural biodiversity systems has been widely observed worldwide. People in coastal regions are especially at risk, due to sea-level rises and associated hydro-geological hazards. The Arab Region is expected to have 598 million inhabitants by 2050, of which around 60 million people – 17 per cent – will live in the region’s coastal cities. In these urban areas, the most vulnerable people to climate change are recent arrivals displaced by war and natural disasters.

According to the Internal Displacement Monitoring Centre (IDMC, 2018), 39% of new internal displacements were triggered by conflict and 61% by disasters. Nowhere else is this movement as pronounced as in Sudan. Displacement factors include a history of civil unrest in South Sudan and forced displacements caused by the development of Nile river dams and exacerbated by the drought in the West Darfur region and the Khartoum flooding crises. The underlying pressures of internal displacement on the receiving areas continue to undermine the capacity of local governments to shift from emergency response planning to implementing sustainable development principles.

The research

In 2016 Nuha Eltinay began work on her PhD at LSBU, under the supervision of Professor Charles Egbu, Dean of the School of the Built Environment and Architecture. Nuha had worked as the Director of Urban Planning and Sustainable Development at the Arab Urban Development Institute NGO. She and Professor Egbu therefore harnessed her experience to develop understanding of how existing

approaches for assessing urban resilience assist decision makers in reducing disaster risk within urban areas in the Arab region.

“Our future plans are based around developing a long-term resilience monitoring programme with the Arab cities’ local authorities that have been involved in the research’s primary data collection stage.”

For her case study area of Khartoum, Sudan, Nuha is investigating the challenges and opportunities facing key stakeholders in the governance of urban settlements of Internally Displaced People (IDPs) in disaster risk zones. “The main research challenge we faced was managing the conflict of interest and power of the different stakeholders involved,” reveals Professor Egbu. “However, by concentrating on qualitative data collected through interviews and focus group discussions, and by exercising caution and awareness of the influences on decision makers’ bias, we avoided compromising the data analysis and the findings’ validity.

“Our future plans are based around developing a long-term resilience monitoring programme with the Arab cities’ local authorities that have been involved in the research’s primary data collection stage. This will yield a detailed picture of local contexts and thus will support decision makers in developing their city-level resilience action plans and adopting the policy guidance developed from our research, whilst also highlighting human and financial capacity imitations.”

Researchers: Professor Charles Egbu and Nuha Eltinay
Research Centre: Centre for Construction Management, Economics and Integrated Delivery
School: School of the Built Environment and Architecture

Impacts

- Professor Egbu and Nuha Eltinay are developing policy guidance to support decision makers in framing an Urban Resilience Action Plan (U-RAP) for the United Nations Office for Disaster Risk Reduction (UNISDR), Disaster Resilience Scorecard
- The research of Professor Egbu and Nuha Eltinay is ultimately supporting the implementation of the Sendai Framework for Disaster Risk Reduction in the Arab Region.
- The research has identified that with the lack of accurate, up-to-date and reliable data on disaster losses for Internally Displaced People (IDPs) in the Arab region, it is vital to make further investments in updating existing hazard maps, and to develop capacity for analysing data to inform the decision-making process.
- Professor Egbu is leading work to develop a long-term urban resilience monitoring programme with Arab cities’ local authorities.
- The research will play a significant role in translating resilience assessment indicators into actions, informing policy and helping to achieve city- and community-level sustainable development in the Arab Region.

Bridging the digital divide:

Ongoing research into virtual and online relationships is shaping our future interactions and the way we work and play.

Background

Many of us are virtual workers to some degree, through being confronted with varying forms of electronic communication at work. Even people working in the same building exchange most information via email or other online platforms, and use digital technologies such as shared databases, intranet and wikis. Those working completely remotely, either from home or as members of outsourced service teams, have to rely almost entirely on digital media, while 'switchers' switch between on- and off-site work, and use both virtual and face-to-face collaboration.

Even organisations that don't currently rely much on digital media are likely to bring in increased virtual work

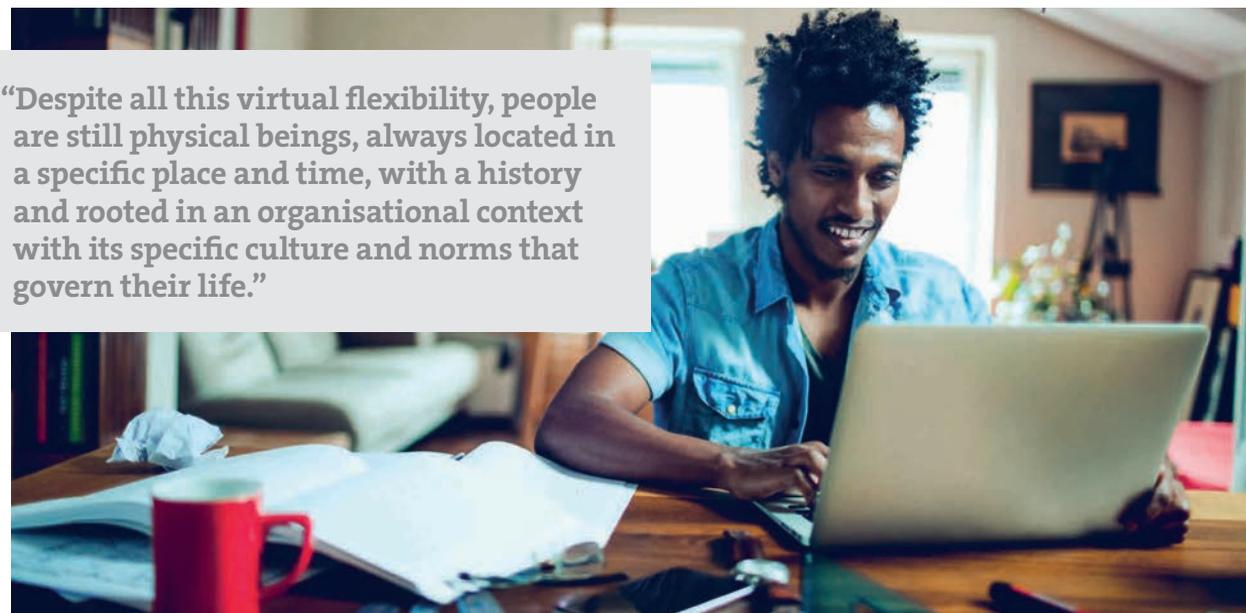
in different forms, driven by technological developments, automation and financial pressures, creating more demand for outsourced services.

The research

LSBU's Professor Karin Moser is a psychologist and computer scientist, with research expertise in the areas of cooperation, virtual work, knowledge-sharing dilemmas, and decisions under uncertainty.

She says: "Digital media facilitates different types of cooperation regardless of location, time zones, organisational affiliation and social and cultural background. Everyone is – seemingly – only a click away and huge amounts of data and documents can be exchanged effortlessly. However, despite all this virtual flexibility, people are still physical beings, always located in a specific place and time, with a history and rooted in an organisational context with its specific culture and norms that govern their life. Because of these developments,

"Despite all this virtual flexibility, people are still physical beings, always located in a specific place and time, with a history and rooted in an organisational context with its specific culture and norms that govern their life."



how to manage virtual work successfully

managers today need to understand the psychology of virtual collaboration, how people cope with the new digital challenges in the workplace, the loss of direct contact in many of their work relationships, and how virtual collaboration can be effectively and purposefully managed."

Professor Moser's latest research in this area focuses on how minimal cues – for example, about someone's professional status or cultural background – influence people's behaviour and perceptions in an online context. "Latest data shows that the influence is massive and subliminal, meaning that people are not aware of the effects of minimal cues. This matters greatly for online platforms in health care or other public service provisions, for instance, and we need to understand those processes so that access is equally open to everyone in society and in the best possible way.

"Moving forward I am particularly interested in psychological factors instilling a sense of trust in an unknown online partner, whether an individual on social media, a private retailer or a government service, which makes people engage, provide information or buy goods. This is important to both protect people from abuse and to educate people about when to trust in an online environment."

Researcher: Professor Karin Moser
Research Centre: London Centre for Business and Entrepreneurship Research
School: School of Business

Impacts

- Currently has an expert mandate with the European Asylum Support Office to support all EU+ member states to improve the use of digital platforms and their collaboration regarding asylum and migration procedures across Europe.
- Has been engaged in applied research and consulting on managing virtual work with four private and public sector companies since 2014.
- Her article Only a Click Away? – What Makes Virtual Meetings, Emails and Outsourcing Successful won the 2013 Management Articles of the Year Award: ISBN 0-85946-458-x (peer reviewed and selected by practicing senior managers).
- Has organised an international symposium on The Role of Context in Virtual Work at the Academy of Management Meeting 2015 in Vancouver (CA) with peer-reviewed published conference proceedings: <http://doi:10.5465/AMBPP.2015.13582>
- The EU mandate with EASO and the collaborations with private and public organisations have already impacted in the way they organise their work practices, for example by adjusting meeting structures to better support actual decision making and by making better use of digital repositories to exchange information before meetings.
- The research has resulted in a number of academic papers and book chapters on managing virtual work that can be found on Research Open: <http://researchopen.lsbu.ac.uk>.

Crossing the county line: Ganging up on emerging urban crime networks

Waltham Forest study is aiding understanding of the changing nature of urban gang culture and its effects both on its perpetrators and its victims.

Background

Like most London boroughs and metropolitan areas in the UK, Waltham Forest struggles with gangs, causing misery and destroying lives. Ten years ago, Waltham Forest funded a pioneering study called Reluctant Gangsters, which showed that many youths had joined local gangs out of social necessity rather than out of choice and that the main driver of these gangs was to defend postcode territories from outsiders.

Gang members described an emotional relationship with their local area and these territories bore little relationship to drugs markets. Since that initial study, however, councils and police services across London have begun to observe that gang behaviour is changing, but the motivations and drivers for this shift have been unclear.

The research

In December 2016, Associate Professor Dr Andrew Whittaker and his team submitted a bid to the London Borough of Waltham Forest for a study to examine how street gangs were changing and assess the risks that they posed. Dr Whittaker leads the Risk, Resilience and Expert Decision-making (RRED) Research Group and his research focuses on the risks faced by young people in London. His previous research on child abuse linked to beliefs in witchcraft and spirit possession was discussed in the House of Lords during the passing of the Children and Families Act 2014, which voted in favour of Andrew's recommendations.

"Waltham Forest staff were impressed by our team and its research track record and so, in March 2017, they confirmed that they would fund the Postcodes to Profit study. The project was formally launched in July 2017, and we conducted interviews and focus groups with a total of 67 participants who were ex-gang members, young people affected by gangs or experienced professionals working with gang members every day," Dr Whittaker says.

The Postcodes to Profit study found that:

- Rising competition in London's drug market has led to gangs moving away from visible turf wars over postcode territories, and towards trading along county lines outside London.

"We have conducted interviews and focus groups with a total of 67 ex-gang members, young people affected by gangs or experienced professionals working with gang members every day."

- Territory has developed a new meaning: instead of an emotional sense of belonging to a postcode to be defended, territory is valued as a marketplace to be maintained.
- Gangs have placed a new emphasis on financial gain: exhibited through alliances with other gangs, and an aggressive expansion outside of London into new markets.
- There is increasing involvement of women and girls, in particular carrying drugs for gangs, meaning that they are frequently at risk of being exposed to violence and sexual exploitation.
- Some gangs operate 'off grid', avoiding social media and using old technology, such as Nokia phones, to avoid leaving a digital footprint, while others embrace social media, using music videos to reinforce 'brand' and gang identity.
- There are potential signs of gangs using technology to access new drug markets.
- Evidence of 'cuckooing': the practice of occupying a gang member's home or property for the purposes of continuing drug-trading activity.

- Child exploitation: there are signs that the youngest gang members are being trapped and enforced unwillingly into gang membership.

Andrew is already working with a leading gang researcher in the US, Dr James Densley, on future projects about how gangs evolve. Andrew is also looking to collaborate with a researcher in Holland on investigating gangs' involvement in the dark net. Further, it is planned that a gang researcher from New York will come to LSBU on a Fulbright Scholarship to engage in joint work.

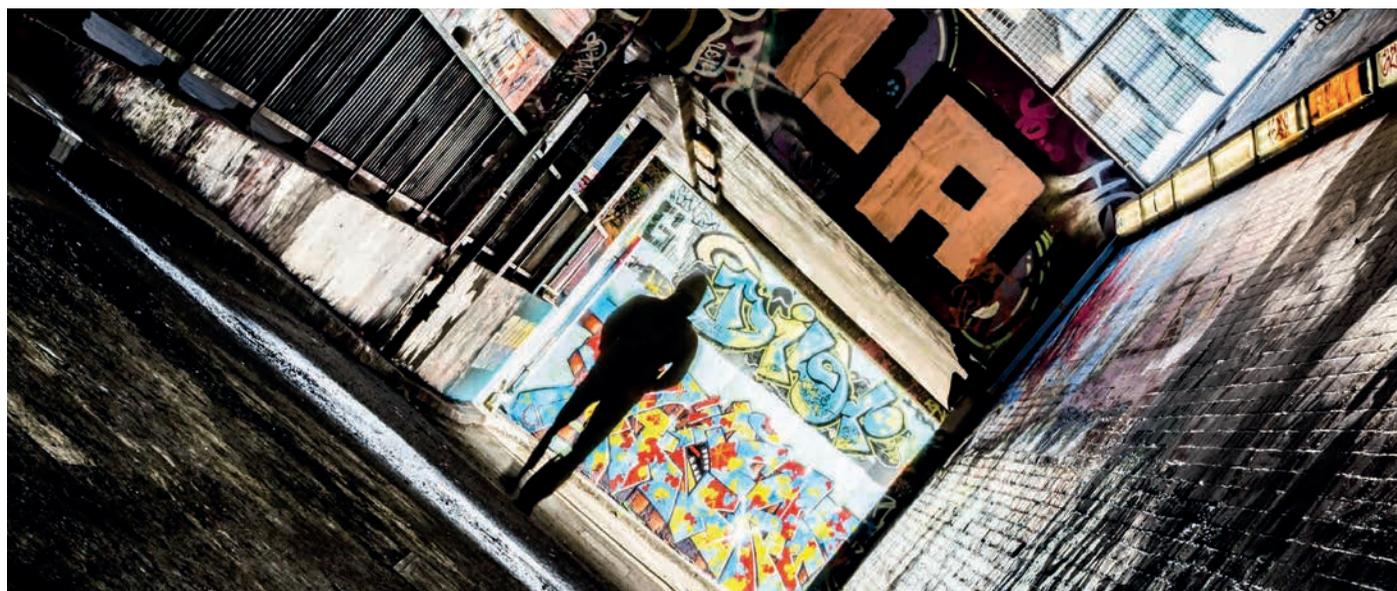
Researcher: Dr Andrew Whittaker

Research Centre: Centre for Applied Research in Improvement and Innovation (CAPII) in Health and Social Care

School: School of Health and Social Care

Impacts

- In response to Andrew's report, Waltham Forest Council has decided to:
 - Allocate an additional £806,000 of funding over four years to reshape their existing gang prevention programme, on top of the existing £2.2m projected spend over that period,
 - Fund its first ever financial investigation team to increase capacity in the borough to seize criminal assets under the Proceeds of Crime Act, and
 - Develop a new strategy for managing gangs
- The Postcodes to Profit study was featured in TV and radio interviews with BBC TV, ITN, BBC and LBC Radio and in press articles in the Times, the Guardian, the Telegraph, Financial Times and the Daily Mail
- The Postcodes to Profit team won the LSBU Research in Action award against 17 other nominations



When War is Over: commemorating the Commonwealth war dead

This multi-faceted study is considering the legacy of the Commonwealth War Graves Commission's commemoration of over 1.7 million war dead, during its centenary.

Background

The Commonwealth War Graves Commission (CWGC) is responsible for the ongoing commemoration of 1.7 million WWI and WWII Commonwealth War Dead. This commemoration encompasses over 2,500 cemeteries, 21,000 other burial grounds and 200 memorials to the missing, in 153 countries across the world. The CWGC designed, built and now maintains these sites, a task that involves an international industry of administrators, quarrymen, stone-cutters and gardeners. They respond to queries from relatives, update records, and tend to worn and damaged headstones, with 22,000 replaced each year. This creates a form of living memorial in which the headstones themselves have a lifespan, from quarry to cemetery, to recovery for reuse as rubble.

The research

In 2011 Associate Professor Daniel Alexander worked on a book titled *Lettering: a reference manual of techniques*, published by Lawrence King. During the research for this book, Daniel and Andrew Haslam, the book's author, discovered that to cope with the volume of work required to memorialise the Commonwealth citizens killed in world wars one and two, the CWGC had developed the pantograph machine, for engraving the names of the dead into grave stones. This sparked Daniel's keen interest in the work of the CWGC.

Whilst exploring the archive of the CWGC, Daniel came across material documenting the process developed to meet the CWGC's ambition of remembering all of the war

dead individually, by name, in perpetuity. "This included 144 ledgers that list, alphabetically, the names and memorial locations of the 1.7 million people commemorated by the CWGC. The CWGC archive revealed the huge organisational effort that continues to go into the development and maintenance of the CWGC's cemeteries and memorials," says Daniel.

"Cumulatively, these discoveries instigated a 6-year-long practice-based research project, which considers the legacy of this act of commemoration at its centenary, spanning the planning of sites through to the international industry that supports their ongoing maintenance."

Daniel's images involve a range of approaches and perspectives: a time-lapse video of the construction of a recently erected memorial; satellite images of cemeteries; documentary photographs of the industrial processes of tombstone construction; closely cropped images of gravestones and epitaphs; and photographic copies of letters and other documents that tell the story of one man's death in action.

Through his research, which is now the subject of a major exhibition, Daniel's work has raised and attempted to answer a number of key questions: "How might these changing perspectives re-orient our understanding of, or alter our feelings for, this act of commemoration? What gets lost and what is gained, as we get closer or further away? What is the correct distance – physical, temporal, emotional – for making sense of war?"

Researcher: Daniel Alexander

Research Centre: Centre for the Study of the Networked Image

School: School of Arts and Creative Industries



7327 WWI Casualties Commemorated, Serre Road Cemetery No.2, Reden Ridge Cemetery No.3, Redan Ridge Cemetery No.1: France, 2014

Impacts

- An exhibition on the work – When War Is Over – was featured in the 2018 Scotiabank CONTACT Photography Festival in Toronto. Curated by Sara Knelman and held at the Harbourfront Centre's Artport gallery, over 3,000 people attended the exhibition in its first three weeks alone.
- Later in 2018, the exhibition will move to the Alliance Française institute in Toronto.
- The exhibition is expected to raise awareness of how the dead are commemorated and develop interest across different strata of society in how we pay tribute to the war.
- The project was published as a book titled *When War is Over*, published by Dewi Lewis Publishing.



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