



BCUR 2023













THE UNIVERSITY OF WARWICK

British Conference of
Undergraduate Research 2023
Book of Abstracts



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Spoken & Performance Panels



SUSTAINABILITY BCUR 1A

BCUR001
Sustainability

Detection and Classification of Floating Plastic Litter Using a Vessel-Mounted Video Camera and Deep Learning.

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Abstract

Marine plastic pollution is a major environmental, social, and economic concern. Despite this, the quantity and distribution of marine plastics are poorly understood. An enhanced understanding of the global abundance and distribution of marine plastics is vital for global mitigation and policy. Remote sensing methods can provide substantial data to overcome this issue. However, developments have been hampered by the limited availability of in situ data due to the costly, time-intensive methods currently deployed. To overcome this issue, I present a novel approach to collecting in situ data using a trained object-detection AI. My model detects and quantifies marine macroplastics from video footage taken from vessel-mounted consumer cameras. The model successfully detected the presence or absence of plastics from real-world footage, which I collected out at sea, with an accuracy of 95.2%. Additionally, the model was able to differentiate between plastic object types with an accuracy of 68%. Overall, these methods provide a low-cost, accessible, and standardised method for collecting in situ data, which can be used to support the development and validation of remote sensing methods. This will improve our understanding of global marine plastic pollution, consequently supporting mitigation and preventative policy. Future studies can develop these methods further to ensure the model is more adaptive, through collecting footage with a wider variety of locations, plastic categories, weather, wave, water turbidity, and water colour illumination conditions. This study is highly relevant in supporting the growing efforts to tackle marine plastic pollution globally.



Evaluating the twin deficit hypothesis in the United Kingdom

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Abstract

This paper analyses the causal relationship between current account deficits(CAD) and fiscal(budget) deficits(FD) in the United Kingdom from 1979:Q1 to 2021:Q2. The traditional theory which postulates a relationship between them is the twin deficit hypothesis, which suggests CAD and FD move one-to-one, with FD causing CAD. The theory has been underexplored in the United Kingdom, with existing literature providing conflicting results confined to the pre-financial crisis era. The theoretical model employed is the traditional Mundell-Fleming framework which provides a transmission chain(FD to CAD) for the twin deficit hypothesis. A Vector Error Correction Model (VECM) was employed, which provides the long-run equilibrium relationship and a Structural Vector Auto Regression(SVAR) was used to study the short-run dynamics in the Mundell-Fleming transmission chain, Impulse Response Functions(IRFs) were used to graph these short run dynamics. The results suggest that the twin divergence view is more valid for the United Kingdom although not one-to-one (1:0.36) in the long run, with reverse causality from CAD to FD. The long-run relationship holds even after considering a single structural break. The twin divergence result is relevant for policy, given the high fiscal deficit during the COVID-19 crisis. The results indicate that in the short run an increase in fiscal deficit would be followed by a temporary rise in CAD but an improvement in the long-run. Examining their relationship over the business cycle in a Markov-switching model would be the next step, as it categories data into different states aka booms and recessions.



The Maritime Sector under the European Emissions Trading System: who is liable for the carbon emission costs?

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Abstract

As of January 2024, the maritime industry is expected to be included in the European Emissions Trading System, where shipping companies will have to purchase 'carbon allowances' (EUAs) that will limit their annual carbon as well as other emissions. Any leftover allowances can be traded to other companies, but exceeding the limit will lead to huge fines. Considering how vaguely the responsible entity is identified by the EU Parliament and Commission in this policy, as well as the interconnectedness of the maritime entities, who will be ultimately liable for the compliance costs? This research is to seek an effective solution to this key question.

The research adopts a qualitative approach, through semi-structured interviews from maritime professionals who are following the different amendments to this new policy. Purposive sampling is used to recruit the professionals including maritime lawyers, shipping company stakeholders, ship owners and charterers. A thematic data analysis will produce different scenarios relating to who will be responsible for the compliance costs of EU ETS and put together recommendations that are fair for all parties involved in sharing that risk.

This research has both managerial and practical implementations. By producing feasible recommendations, it can benefit stakeholders, ship managers and charterers because they can apply them to their operation strategies as well as avoid business conflict by allocating the risk correctly in contracts. Furthermore, they can avoid the damages that non-compliance can cause as well as contribute to the EU's net-zero target by 2050.



How can the spread of Monkeypox virus be prevented?

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Abstract

Background: Monkeypox is a zoonotic disease caused by monkeypox virus. Until recently, cases have largely been confined to regions of central and western Africa. Smallpox vaccination had provided some cross-immunity against monkeypox infection, but cessation of this programme following the eradication of smallpox in 1980 has removed this protection. In May 2022, monkeypox cases were recorded in the UK, marking the beginning of a global epidemic which has spread to over 100 countries. Effective preventative measures are therefore essential to halt the rise in cases and end the current outbreak.

Aims: The aim of this project is to review the current literature about prevention of monkeypox and determine which are the most effective strategies.

Methods: A comprehensive search of PubMed, Web of Science and Embase returned 1617 papers. Screening of these papers identified 26 pieces of primary literature concerning the prevention of monkeypox, which were analysed during this project.

Results: Our search identified a variety of strategies which have been investigated for use in the prevention of monkeypox. Animal models involving non-human primates demonstrated the effectiveness of vaccines such as ACAM2000, LC16m8 and the MVA-smallpox vaccine in preventing monkeypox infection. Raising awareness through education, and novel therapies such as immunotherapy are alternative strategies which have also been trialled for monkeypox prevention.

Conclusion: The prevention of monkeypox is underpinned by an effective vaccination strategy, targeted at high-risk individuals. However, supplementing vaccination with additional preventative measures such as education and good hygiene, provides the greatest hope of ending the current outbreak.



Exploring patient's experiences with bronchiectasis

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Abstract

Introduction: Bronchiectasis is a chronic lung condition characterised by dilated, often thick-walled bronchi, leading to frequent chest infections, cough and sputum. Patient experiences are vital in understanding bronchiectasis, however, research on this area is scarce. Our aim was to explore the experiences of people with bronchiectasis and identify common themes.

Methods: Eleven patients with bronchiectasis participated in semi-structured interviews. The interviews used a topic guide focusing on everyday life with bronchiectasis and its impact on the participants' health status. All interviews were audio recorded and then transcribed using the true verbatim technique. Data were manually coded and key themes were identified.

Results: Participants reported variable experiences on living with bronchiectasis and the consequences of this disease in their daily lives. Commonly emerging topics were categorised under three main themes: 1) the impact of bronchiectasis on levels of functioning according to International Classification of Functioning, Disability and Health, 2) the patient experience of bronchiectasis, 3) the management of bronchiectasis. These themes were further divided into sub-themes. Most participants felt in control of their disease and still maintained an active, albeit sometimes "slower", lifestyle. Some found their illness frustrating and embarrassing, highlighting the lack of understanding about bronchiectasis by the general public.

Conclusion: Patients' perception of the effects of bronchiectasis on their lives is variable but can influence multiple daily activities. Clinicians should be mindful of the different and often negative impact of bronchiectasis on peoples' wellbeing. This could improve the patient-clinician therapeutic relationship and ultimately bronchiectasis management.



Predictive Modeling of Breast Cancer using Maximum Mean Discrepancy Whole Slide Image Kernels

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Abstract

Breast cancer is the most commonly diagnosed cancer type resulting in over 680,000 yearly worldwide deaths. As a result, it has been extensively studied in computational pathology, especially the task of cancer prediction and survival analysis. For cancer status prediction current literature highlights an alteration in the TP53 gene as a strong indicator of the disease with it appearing in approximately 30% of cases. Knowledge of a mutation can be a determinant of underlying pathways and treatment options. Survival analysis aims to predict the lifespan of patients to estimate their prognosis. Current efforts have focused on solving these tasks by feeding small chunks (patches) of scanned breast tissue slides, Whole Slide Images (WSIs), into machine learning models to make patch-level predictions. This means we lose high-level structural information and must rely on aggregations to make slide-level predictions, which are not always appropriate. This paper introduces a novel approach that captures slide-level discrepancy of images by calculating the Maximum Mean Discrepancy between any two slides to generate a similarity kernel. Using this method, we condense the information of a multi-gigabyte dataset of 1,133 publicly available breast cancer WSIs into a single matrix of only 4MB that achieves state-of-the-art performance for both slide-level predictions of TP53 status and survival prediction while being able to fit into computer memory. This research sets the foundations for a new branch of computational pathology that could be used for numerous predictive and prognostic tasks of a multitude of different medical conditions.



Creation of Pedagogical Software for Equilibrium Comparison Methods in Microeconomics

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Abstract

Comparative statics is an economic-equilibria comparison method that can be applied through constrained optimisation to analyse how consumers and producers respond to price changes subject to their budgets. Numerous undergraduate students find this topic difficult to grasp and visualise due to its graphic and algebraic complexity. Furthermore, current pedagogical practices providing relatively non-interactive material to students may also restrict their intuition-building through independent experimentation. My research encompassed the derivation of generalised multivariate solution equations through the Lagrange method for the Constant Elasticity of Substitution (CES) and Cobb-Douglas (CD) forms, whose purpose lies in producing an online visualisation tool showing the mathematical application of comparative statics to microeconomics through calculations and graphs subject to the user's input values. By equipping the software with numeric boxes and slide bars, they can freely explore comparative statics and thus strengthen their intuition through hands-on experience. A website was developed and divided into sections: About the Creator, User Guide, Theoretical Framework, and Graphic Visualisation. The latter contains my Wolfram Demonstrations, embedded in numeric calculations and graphic displays for user interaction. I expect students and lecturers, first in Warwick and hopefully then in other institutions, to use the finalised online visualisation tool to complement in-class learning as a potentially revolutionary instrument for contemporary pedagogy. Additionally, I firmly believe that my research, showing the integral value of utilising technology to communicate ideas, will spur the interest of other undergraduate students to produce similar tools to stimulate the understanding of different topics for applied mathematics in economics.



Recreating the Past with Virtual Reality: Stone Circles and Evocative Ethnography

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Abstract

Virtual reality is an exciting and emerging tool within Anthropology, useful for stakeholders of projects, but also students and researchers as well as the many applications available for public education and engagement. The possible uses of virtual reality within the discipline are endless and mark a new way to explore the past. Recent advances have allowed for researchers to, for example, build virtual field schools, allowing accessibility on a new level for students, rebuild lost buildings, and allow multiple researchers from global locations to work collaboratively without actually being in the field.

I will utilise VR storytelling to investigate the ritual use of stone circles. Using elements of experimental and theoretical archaeology and anthropology, I will combine research into the ritual use of stone circles with VR software to create an immersive educational experience accessible to all, allowing users to not only investigate the area but bring it to life. There have been many contrasting theories surrounding many elements of stone circles: can we utilise VR to better unlock the mysteries within these structures, giving us a better understanding of the past?

The use of evocative ethnography in combination with VR allows us to immerse ourselves in the past, and with further development could prove an invaluable tool for education, engagement, and academic research. Combining new and emerging technologies with tried and tested anthropological methods creates many exciting opportunities which should be explored.



The experience in the stigmatization of “depression” in the personal growth of Hong Kong university students with mental health problems.

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Abstract

Around this recent year, Hong Kong experiences an unprecedented situation from Covid 19 that influences various Hongkongers' life, especially Hong Kong university students. To prevent societal infection, the Hong Kong government implemented preventive policies, such as restrictive social distancing measures and the dine-in ban, to restrain individual activities. Consequently, the student's mental illness is closely related to the distribution of the "normal social life" and educational pursuits behind Covid-19. Several students suffer from depression or encounter the deterioration of depression during Covid 19. That enables us to re-emphasize and re-examine the issues of students' depression and how they experience stigmatization of their depression, which affects their personal life. This research focuses on Hong Kong university students with mental health problems and explores how their experience of the public and self-stigmatization of depression impacts their personal growth in academic, social, and employment areas. We replenish some concepts in the modified labeling theory for the framework. Not only do we focus on the interaction between the stigmatized and the stigmatizers and its impacts on the stigmatized, but we also emphasize what prompts the stigmatization. Within the research, qualitative research will be applied to data collecting with the concept of the modified labeling approach. We will conduct individual one-to-one interviews through Snowball sampling. The sample size is 7 participants (n=7). Therefore, this research could be applied in university schools, raising the awareness of those students and schools in seeking or proposing more implementation to minimize the adverse effects on those stigmatized depressed individuals.



Investigating the effect of ankle dorsiflexion range of movement on peak vertical ground reaction force in drop-landings of healthy adults: a systematic review

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Abstract

Background: Increased peak vertical ground reaction force (VGRF) may increase incidence of anterior cruciate ligament (ACL) injury. Incidence of ACL injury in the general population is exceptionally high. Existing literature appears conflicted on a possible correlation between ankle dorsiflexion range of movement (ADROM) and peak VGRF. If a significant correlation between ADROM and peak VGRF is identified, ADROM may be a quick cost-efficient method of screening for ACL injury risk with minimal specialist training.

Objective: To systematically review the literature investigating the effect of ankle dorsiflexion range of movement on peak vertical ground reaction force in drop-landings of healthy adults.

Methods: A systematic search of electronic databases using EBSCO was conducted in December 2022. Additionally, reference lists were searched from articles meeting the inclusion criteria. Six relevant studies were identified and critically appraised using a modified Downs and Black quality index.

Results: There were 179 participants across six studies included in this review. One study was a randomised controlled trial, five studies were cross-sectional. Five studies found no significant correlation between ADROM and peak VGRF. One study found a significant negative correlation between ADROM and peak VGRF.

Conclusion: There is limited evidence of a significant negative correlation between ADROM and peak VGRF in drop-landings of healthy adults. Contradistinctions of landing tasks made generalisability of results difficult. Further research across a variety of sport specific landing tasks may provide real-world application of a possible relationship between ADROM and peak VGRF.



An umbrella review of the health status of refugee children and adolescents in Europe.

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Abstract

METHODS: Inclusion criteria: Systematic reviews produced between 2012-2022, discussing the health status of refugee minors (age <18) explicitly, carried out in Europe written in English. Studies failing to explicitly separate or identify data relating to minors or were excluded. Searches were carried out on Embase, Medline, Psychinfo and Cochrane library on week 43 of 2022 (24/10/2022), identifying 71 studies of which five studies were included in this review. Risk of bias was assessed using the Joanna Briggs Institute critical appraisal toolkit.

RESULTS: Five systematic reviews were included in this review; two relating to physical health status and three relating to mental health status. At least 100,000 participants in some parts of this review. Communicable diseases identified at higher rates of Hepatitis B, Tuberculosis, and Malaria, whereas non-communicable diseases included dental caries, Anaemia and Vitamin D deficiency. Mental health reviews identified higher rates of PTSD, anxiety, depression, suicidal ideation, and emotional and behavioural problems relative to the host population.

DISCUSSION: Studies included were generally of high quality however participating studies in reviews varied in quality due to risk of bias due to study design and heterogeneity of findings. The review has identified focus areas for interventions (prevention and treatment) of great importance in this population group. Areas for future research in this population group include physical health conditions, treatment and prevention of disease, and access and utilisation of services.



Evaluation of Toxicological Effects of Snake Venom in Planaria Flatworms

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Abstract

Planaria are freshwater flatworms widely used in neuropharmacological research, regeneration studies and toxicological screening as an *in vivo* model due to the presence of central nervous system and human-like neuronal messengers. This project aims to identify the susceptibility and behavioural changes in planaria following their exposure to a rattle snake venom. Snake venoms contain pharmacologically active substances which cause different responses following envenomation dependant on snake species. Rattlesnake's venom, usually causes swelling, blood clotting issues and bleeding in human.

In our experiments planaria were exposed to rattlesnake venom at concentration 0.4 $\mu\text{g}/\text{mL}$ for fixed time. The venom effects were evaluated by calculating the number of times planaria crossed gridlines in a Petri dish and analysed against control group using student t-test. It was established that the average number of the gridline crossings was statistically different in venom-treated planaria compared to control ($p \leq 0.05$). This indicates that exposure of planaria to the venom results in their reduced mobility. The reasons for this venom effect on planaria are currently unknown.

The next stage in our study is to identify whether venom-exposure affects planaria's body regeneration and whether the venom can cause disruption to the barrier function of their epithelia.

Medicinal potential of snake venoms is well known with several examples for successful development of novel pharmacologically active compounds from this natural source. Better understanding of planaria's susceptibility to the venom can potentially advance toxicological screening studies and pharmacological research.



The Relationship Between Finance and Inequality: Evidence from Japan.

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Abstract

It is widely thought that financialization of the global economy can drive economic growth by allowing for more efficient capital allocations internationally. But how much of this growth goes to the bottom earners in society? This is the question my paper asks. I use the 'Big Bang' of financial deregulation in Japan 1997-1999 as a case study to examine its long-term effects on bottom 50% income share in the country. I construct a 'synthetic control' Japan based off the sum of weighted averages of other OECD countries, which best reflect the trend of Japanese bottom earnings before the Big Bang, and observe how the time series of bottom incomes for the control diverge from the real Japan after deregulation. Given previous research have indeed found that top income shares have increased because of financialization, I expect that my results will show the contrary for bottom income shares. This research is important since it adds weight to a significant criticism of financialization. Whereas previous research demonstrated that financialization may boost top 10% income shares, it does not necessarily follow that it is the bottom earners who have their share reduced. This paper tries to show that. My paper has applications across economics and sociology, especially the former, as it challenges a core assumption that many in the field holds, that a more efficient financial system is better. Given the increasing complexity of modern financial instruments, further research on if new financial products themselves may also have this effect is recommended.



To what extent are crypto-currencies enabling money laundering and the financing of terrorist organisations?

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Abstract

Terrorist organisations are using money laundering methods to finance their activities. Post 9/11 states have implemented numerous preventative measures and policies to tackle money laundering and terrorist financing. However, its future is increasingly pursued through rapidly booming digital assets such as bitcoin and other crypto currencies for many reasons including the ease these assets transcend boundaries and their anonymity. As a result, there has been an increase in financial crime especially around digital assets and terrorists are turning to them as a new source to launder money and finance themselves. It is crucial to investigate how we can narrow the abuse of these digital assets in particular being carried out by terrorist organisations, especially as we are nearing mass-adoption of them. The research falls into three topic areas, a) regulation and polices, b) legal framework and c) the technology behind these digital assets. I will be examining existing preventative measures states, banks and other organisations have in place to help regulate and prevent money laundering. As the technology around digital currency develops and advances, the regulation and polices, legal framework and technology also develops but so do potential flaws within them. The research will utilise qualitative research methods and through a set of interviews with 'experts' within the three topic areas. I seek to fill in these 'gaps/flaws' and recommend new strategies and polices that could be implemented, that can go on to help regulate and even police these digital asset laundering activities and further boost counter-terrorism efforts.



Investigating the pathological role of Tau associated with Alzheimer's disease on the nucleolus of neuronal (SH-SY5Y) cells

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Abstract

Alzheimer's disease (AD) is a neurodegenerative disorder characterised by physical alterations of the brain that lead to behavioural symptoms. AD is marked by the production of amyloid plaques and neurofibrillary tangles (NFTs) in multiple brain regions. Despite the rising prevalence of AD there is yet no cure, therefore it is necessary to develop a good model of research.

NFTs are intracellular aggregates made of the highly-phosphorylated protein tau, and they constitute the main pathological hallmark in tauopathies such as AD. NFTs impair the function of the neuron in multiple ways which alongside other factors lead to neurodegeneration in AD. Although tau is mainly found in the cytoplasm it can also be found in the nucleolus where it has important functions. Here we investigate whether the nucleolus is impacted under AD conditions.

We induced tau phosphorylation to mimic AD conditions, we did this by treating neuronal (SH-SY5Y) cells with an antibiotic known as tetracycline for multiple time frames (6, 24, 48, 72, and 96 hours). Viability assays and immunofluorescence imaging were then performed. Phosphorylated tau (P-Tau) was associated with increased cell death, this was correlated with prolonged P-Tau expression. Decreased nuclear volume was also observed, and although nucleolar volume remained unchanged, there was a significant increase in tau intensity in the nucleus and nucleolus with prolonged tau phosphorylation.

These findings suggest that the nucleolus may become impacted under AD conditions. Future studies further investigating nucleolar tau in tauopathies may aid in the development of treatments targetting tau in the nucleolus.

**COMMUNITY** BCUR 1FBCUR016
Community

The Effects of Disfluent and Fluent TikTok Videos on Young Adults' Conspiracy Beliefs

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Abstract

TikTok is a social media platform that has quickly become a source of news and information for young people. Misinformation and conspiracy theories spread quickly on TikTok and are becoming a growing problem, so it is important that users can think critically about the information they consume. Fluency of processing can affect analytical thinking. A stimulus can be made disfluent by making it harder to process, typically by making a written stimulus harder to read. This project is one of the first to apply disfluency to a video format by degrading both the audio and the visual information.

100 young adults (aged 18-24) completed the Adolescent Conspiracy Belief Questionnaire (ACBQ) and were assigned to watch either fluent or disfluent TikTok videos about conspiracy theories. After completing the ACBQ again, they were then asked a series of questions to rate the videos trustworthiness and reliability. Participants who saw the disfluent TikTok videos had significantly lower conspiracy belief scores afterwards, than those who watched the normal (fluent) versions. People who watched the disfluent videos also rated them as significantly less credible sources than those who saw the fluent videos, which suggests they had thought more critically about the reliability of the information. These findings suggest that disfluency can increase analytical thinking and reduce attitude and belief change in video formats. This research is one of the first to look more closely at how information in TikTok videos is processed and opens new avenues for future research to explore.



In-vitro investigation of the oropharyngeal tumour microenvironment crosstalk using a co-culture model system

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Abstract

Oropharyngeal cancer (OPC) is the 8th most common cancer in the UK. Human papillomavirus (HPV) is a common cause of OPC, a common sexually-transmitted infection contributing to the increasing incidence rate. Additionally, the tumour microenvironments (TME) has also shown to play a role in cancer development, making it an important factor in cancer diagnosis and research.

The aim is to study the crosstalk between fibroblasts (primary normal fibroblast (NOF) and cancer-associated fibroblast (CAF)) and OPC cancer cells (OPCCL) in different co-cultures (passive and active). HPV+ (SCC2) and HPV- (SCC89) OPCCL were used as disease representative. Cells were grown to ~80% confluency and the conditioned media (CM) using serum-free media was harvested after 24h incubation. OPCCL were then treated with fibroblasts CM and vice versa for 48h. A calorimetric assay (with MTS reagent) was determined using a UV-spectrophotometer (480nm) for quantitation. Results show a significant 13.6% increase in SCC2 proliferation relative to control when exposed to CAF CM compared to NOF CM.

Finding suggests a crosstalk in the TME where CAF influences OPCCL proliferation, especially for the HPV+ OPC. This suggest an active role of fibroblast in the TME and can be a target for intervention. Nonetheless, additional exploration is required to better understand the TME. Western blotting and enzyme-linked immunosorbent assay (ELISA) can be utilised to determine the protein that involved in the cell-cell communication. Proteomics can also be used to better profile the crosstalk protein expression. This can highlight potential biomarkers or drug targets for treatment.



Project development, robust planning or hopeful projections?

Daniel Gautrey

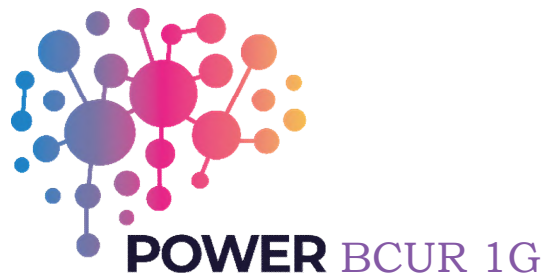
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Abstract

The planning stage within any project is regarded by many as the most significant contributor to successful project delivery (e.g. Merrow, 2011; Abdallah et al., 2022). Yet studies continue to show project failure, the cause of which can be tracked back to the planning stage (Samset and Volden, 2016). Most of these studies have taken place in major public investment projects with suggested causes being high levels of uncertainty (or unknowns) or an unclear understanding of the requirements at hand. As the researcher is a degree apprentice within a large aerospace engineering company, the opportunity arose to undertake a grounded theory based study of two live projects at the pre plan/planning stage and delivery/closure stages.

This is an inductive study with the phenomena of project planning and its influence on project delivery within a large commercial aerospace company being the focus. Whilst a grounded theory approach would normally discourage reviewing literature, some directed the inquiry by providing a 'sensitizing' review of the literature (Strauss & Corbin, 1990; 1998). The themes derived from the data thus reflect the experiences of the interviewees as they discussed their work as well as being indirectly illuminated by the project planning literature.

Although as noted there have already been studies attempting to comprehend links between project planning and project delivery failure, these have primarily been within the public sector. Through using the context of commercial aerospace engineering this work contributes to the field of project management by expanding the perspective on the phenomena.



Sticks and Stones: The Forgotten Impact of SALWs in Modern Conflict

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Abstract

Often, when discussing the global arms trade, we confine ourselves to discussing Weapons of Mass Destruction, ordnance, or Lethal Autonomous Weapons. Yet, when considering low-level conflict, border disputes, and non-state actors, small arms are often much more important due to their ease of use, availability of acquisition, constant presence and use as tools of intimidation as opposed to solely tools of destruction. Despite this, they are regularly forgotten as newer, more destructive, yet less-common weapons are pushed to the forefront of arms control discussions due to their rarity, incomprehensibility, and novelty meaning that there is no established precedent for governance in the way that exists for Small Arms and Light Weapons. This does not, however, mean that they deserve more attention than small arms, more pertinently, it does not mean that the SALW trade should be forgotten, as this allows for their unfettered proliferation, a hugely dangerous proposition in new-wars that do not always involve a mechanised, national military. Through my research, I aim to shed light on the importance of SALWs in modern warfare. All of this will go beyond solely military effectiveness, focusing on the human security impact of SALWs, both physical and physiological, on civilians and individual combatants, inspired by Stockholm International Peace Research Institute researchers I interviewed at the early stages of my research. Through this, I aim to advocate for greater monitoring of global SALW transfers, whilst reframing the arms control debate putting human security first.



Investigating Public Attitudes Towards Transgender Offenders

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Abstract

There is currently relatively little literature and research about transgender offenders in the criminal justice system (CJS), particularly those with a history of sex offences. Additionally, there is a socio-political interest in the placement and treatment of this vulnerable group in the prison service. Therefore, this research will analyse quantitative data with a factorial ANOVA that has been collected via an online questionnaire. Participants were shown newspaper-style vignettes describing either a transgender male, transgender female or male that has either committed a violent offence or sexual offence. All participants then completed a blame attribution scale (adapted from Sleuth and Bull, 2012) and were asked to specify what gender they believed the perpetrator to be. Lastly, participants completed an Attitudes Towards Transgender Men and Women (ATTMW) Scale (Billard, 2018), that included separate sub-scales for transgender men and women. The results will be used to inform the forensic field on whether public attitudes towards transgender offenders differ depending on the perpetrator's gender identity and whether the crime committed is a sexual or violent offence. This research can be used to inform the CJS and practitioners in the forensic field of the public's attitudes towards transgender offenders and the implications this may have on the treatment of transgender offenders throughout the prison service. Further research recommendations include; to compare public attitudes and staff attitudes and to inform the current knowledge of the public on this group, and to explore whether forensic staff need specific training to understand and effectively help transgender offenders.



Mothers' experiences of empowerment from social workers following domestic violence and abuse: An intersectional feminism approach.

Naomi Jones

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Abstract

Domestic Violence and Abuse (DVA) is a significant and pervasive issue of epidemic proportions in the United Kingdom and internationally. Social workers are important social care professionals who work with survivors of DVA. The social work (SW) profession is based on values that emphasise emancipatory practice through empowering individuals they support, considering social divisions such as race and sex.

This research explores mothers' experiences of empowerment from social workers when subject to DVA, through an intersectional feminism lens. A literature review was conducted, and five databases were searched using key search terms. The inclusion and exclusion criteria selected ten papers from 2012 and were analysed using reflexive thematic analysis. Two key themes emerged: Patriarchy and Power and Control.

The discussion of findings establishes the patriarchal influence on gender norms, societal structures, and language. SW's use of power and control through post-separation abuse and ultimatums, exacerbated by high workloads and a lack of adequate training. Providing a socio-political understanding of the multifaceted factors limiting mother empowerment, with evidence of subtle unconscious engrained discrimination ultimately leading to the disempowerment of mothers.

The intersectional lens through which the research was conducted enhances the ambitions of anti-oppressive SW practice. A further mixed-method research study is proposed to provide further exploration of empowerment through each theme, focusing on understanding how SW practice could contribute to ending oppressive practices within DVA. Moreover, urgent reform and change to policy related to DVA are needed to address wider systematic inequalities, with changes required being underpinned by intersectional feminism.

**COMMUNITY** BCUR 2ABCUR022
Community

Impact of Domestic Political Regimes on Remittance Receipt in Sub-Saharan Africa

Toluwanise Odejide

*University of Warwick, Coventry, United Kingdom***Abstract**

During the COVID-19 pandemic, remittance inflows were expected to fall by 20%. (KNOMAD, 2021). They did not – prompting a fresh enquiry into the determinants of remittances, particularly on a macro-level. (Yakshilikov, 2021; Dinarte-Diaz, Juame and Medina-Cortina, 2022). Macroeconomic determinants of remittances are underexplored in comparison to more comprehensive models and theoretical frameworks of microeconomic determinants. (Hagen-Zanker and Siegel, 2007). There is even less exploration of the political economy of remittances and potential interactions between political regimes and remittances. Any consideration of this relationship is limited to the subject fields of international relations and political science.

Of the existing research into the intersection of political regimes and remittances, the relationship remains unilateral, focused on the impact of remittances rather than causation factors. Escribà-Folch, Meseguer and Wright (2015) discuss whether the receipt of remittances leads to increased democratisation within the state. Conversely, this research paper hopes to explore a reversal of this context, looking into whether democratisation within a state can impact the level of remittance receipt.

The significance of pursuing this topic in this geographical region exists in a policy context and in its relevance to the scholarship. Looking first to the macro-policy, as remittances are an important source of income for some countries, they cannot be disregarded as part of the answer to Africa's development question. Understanding how to harness remittance inflows is useful for development. Taking an interdisciplinary perspective then, may spark some thought towards other macro variables, escaping the intellectual preoccupation with the individual migrant.



To investigate how to attract, train and retain volunteers in the entertainment sector: A Case Study of The Grand Theatre in Blackpool.

Heather Clavering

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Abstract

Using the Grand Theatre in Blackpool as the case study, an investigation will establish how volunteers are attracted, trained, and retained by the business so that recommendations can be made to ensure the continued success and viability of companies within the arts sector. Volunteers are an essential workforce for the sector, which is extremely important for both the UK's heritage associations and local communities. However, numbers have drastically decreased over the last few years, and the industry is now challenged with attracting new volunteers, providing training relevant to the role, and retaining those members for the future survival of businesses.

Deductive in approach, this study will use a combination of both qualitative and quantitative research methods. Participation in a voluntary role at the Grand theatre will enable in-situ observations relevant to the study. This will be followed by a semi-structured qualitative interview with a member of the management team with questions relevant to the research objectives posed. However, both these methods may have an element of bias as they are reliant upon personal interpretation by the researcher, so a survey will also be posed to volunteers within the theatre to triangulate the research methods and increase credibility of the findings.

The outcomes of the proposed study are currently unknown; however, it is relevant due to the uncertainties for the future of theatres. The results will propose potential changes for the venue to ensure viability for the future and aid in the recruitment, training, and retention of volunteers.



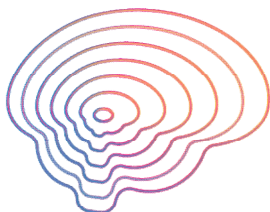
Stop Scratching! Research Into the Knowledge and Experiences of Early Childhood Practitioners Caring for Children Diagnosed With Atopic Dermatitis (Eczema).

Katy Newell

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Abstract

Atopic dermatitis (Eczema) is a chronic condition affecting one in five children in the UK. Despite the physical symptoms being commonly acknowledged, the psychological consequences of the condition can be significantly problematic. It is crucial that early years (EYS) practitioners have the knowledge to support children with eczema (CWE) to reduce these adverse consequences. The consequence of stricter sanitation combined with increased stress levels resulting from the coronavirus pandemic may have culminated in those with eczema, like myself, experiencing flare-ups. There is also a potential stigma associated with eczema symptoms due to the 'fear' of disease post-pandemic which could result in social exclusion. The main research questions are: (1) how do EYS practitioners care for CWE?, (2) are there barriers preventing EYS practitioners from providing appropriate care to CWE?, (3) how CWE are included within EYS settings? and (4) what existing knowledge do EYS practitioners have about CWE? A small-scale exploratory study using relativist etic methodology will collect qualitative data via electronic questionnaires distributed via social networking groups. Inductive thematic content analysis will then be used to analyse the data and draw conclusions. The possible implications of this research could include creating accessible training materials for EYS practitioners to give them the confidence to provide appropriate, individualised care to CWE. These training materials could include how to apply treatment, how to adjust play activities to be inclusive of CWE, and examples of children's books and strategies that intend to inform others of eczema to prevent social exclusion.



SUSTAINABILITY BCUR 2B

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Sustainability

Early Holocene bio productivity and surface wetness changes at Liffey Bog, Wicklow Mountains (Ireland)

Rebecca Cole

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Abstract

The importance of past climate reconstruction is becoming clearer than ever, for they can help model our future ever-changing climate by connecting past characteristics to present trends. This research project aims to reconstruct past climate conditions from Liffey Head peat bog, Ireland roughly 5000-9000 years ago to understand if and when natural environmental or human-influenced changes were the cause for peatland ecosystem fluctuations. There are few past climate reconstructions in Ireland, and fewer in Wicklow mountains, which this study intends to cover, and the use of a peat bog for these reconstructions is not unique, but a well-tested technique. Using data on Loss on ignition and humification collected from 3 cores, we can understand levels of decomposition (biological productivity) and bog surface wetness (BSW), and inform ourselves on precipitation and temperature changes in the area, or wetter or dryer periods created by human land use changes. Peat bogs are an important part of our landscape, as they hold unique biodiversity and store lots of greenhouse gases (GHGs); and with a warming climate, there is a potential for these peat bogs to act as a tipping point for irreversible climate change if they dry and release their stored GHGs. Our findings show biological productivity and BSW fluctuate frequently throughout our time period, with a particular drying period 6500 years ago, however, there is a visible lag between the two data sets. It is essential we study these peats so we can predict whether they will act as a tipping point environment.



A Critical Evaluation of The Impacts That Virtual Reality is Having on The Events Industry.

Harry Sutton

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Abstract

A critical evaluation is to be conducted with three main themes being considered and they are generation theory looking more specifically at generation alpha, the impacts that virtual reality is having on the industry, and the rise of virtual events. The pandemic lockdown saw a big shift in virtualism throughout the industry, therefore analysing data both post covid and pre covid will also make for interesting results.

The study is to be deductive in approach, with a mixture of methods to collect both qualitative and quantitative data. Secondary research shall be carried out via a thorough literature review making sure all material is reliable whilst remaining unbiased in approach. Primary research is to be carried out through the use of a survey that will be distributed to people in the industry or parents that may have children in the generation being considered. Finally, a semi structured interview will be held with a specialist in the industry.

Proposed study outcomes are currently unknown, yet the subject matter is highly relevant for a number of reasons and this research could highlight the importance of having a virtual aspect, in terms of longevity.

The results will highlight recommendations for event planners moving forward as it is clear the virtualism in the industry continues to grow. Furthermore, generation alpha has a more intimate relationship with technology than ever before. This study will potentially find a correlation in this and increased demand in virtual reality events. Keeping in mind generation alpha are next in line.



Barriers and Drivers of Renewable Energy Transition in China – A Systematic Review

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Abstract

To fulfil energy demand in a sustainable manner – (meeting climate action goals), the International Energy Agency argues a need for a total transformation of the energy supply chain. There is an explicit link between energy and the economic, social, and environmental sustainability pillars. Geopolitical issues have affected the global market for energy sources, making fossil fuels popular, and harming all three aspects of the energy trilemma. To ensure we smoothly transition to renewable energy and prevent future shocks in the energy sector, I will be conducting a systematic review via Scopus, to summarise all existing barriers and drivers of the energy transition in China. The energy trilemma would be used, it has been proven to come hand in hand with energy governance and shows implications for the success of initiatives in climate action. The initial results of my search query were 273 pieces of literature, through the first stage of screening, 220 remain, and 135 remained after the second stage. All 135 were read, the main drivers included environmental impacts, social impacts, governmental policies technological innovation, and proper electricity grid management. The main barriers included costs, a one-size fit approach, the power of the coal industry, and the supply of critical materials. Recommendations are made based on this systematic review. This search query should be altered annually as we should consider new technology and interventions.



Abstract: Exploring neurodivergent experiences

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Abstract

How do we currently approach and understand neurodiverse experiences? What role do policies play in these experiences? This research aims to explore and challenge public understanding of neurodiverse experiences and neurodiversity frameworks. This was explored by a series of focus groups with neurodiverse individuals. We explored individuals' relationships with the term neurodiversity and how this shapes their everyday experiences. Neurodiverse individuals reported positive relationships with diagnosis and accessibility policies. Most participants were advocates for neurodiversity within their fields of work. Less educated neurodiverse individuals struggled to be accepted into society compared to their better educated and more fortunate counterparts. There is an increased need to develop and spread the meaning of neurodiversity to allow better accessibility going forward.



An Audit of Partner Notification among new diagnoses of HIV during the Pandemic

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Abstract

Background: HIV Partner notifications are an effective intervention for finding those with undiagnosed HIV and allows the identification of those at the highest risk of HIV.

Aim: To audit HIV Partner notification service provision at a local clinic

Methods: A retrospective electronic notes review of all patients, to identify patients diagnosed with HIV between January 2020 and February 2022. Completed yellow notes and HARS data used to identify information on the number of PN per index case. Data collected included demographics plus HIV incidence test results and CD4 count. Data was analysed and HIV PN for clinic compared to the HIV Partner notification Standards Outcomes 1 and 2.

Results: Number of contacts tested per Index case at the clinic was above the national HIV PN standards of 0.6, at 0.7 for outcome 1. When looking at the numbers separated by gender and stage at presentation, women (0.56) and patient present with CD4+<200 (0.58) fell below this standard. Literature suggests this might be due to female index cases often listing fewer partners or the late-stage presentation. Some ethnicities such as mixed (0.4) and ethnic other (0.25) also fell below this standard but that could be attributed to the small sample size.

Conclusion: The clinic appears to be in line with the HIV Partner notification standard Outcome 1 and 2. However, seems to fall short of this when it comes to women. A follow-up audit could be done over a larger time period to increase the sample size and review the number post-pandemic.



‘There’s no hate like Christian love’: How religious exemptions in the law have impacted women’s rights

Alexia Kieya

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Abstract

For a long time, the extent to which the church and state are separated has been a topic of continuous debate in the US which has recently gained traction again due to the use of religion, more specifically Christianity, as part of the justification for attempts to erode reproductive rights. In a letter to the authors of the Treatise of the Three Imposters, Voltaire famously asserted, ‘If God did not exist, it would be necessary to invent him’ - demonstrating the centrality and perhaps necessity of religion as a component of social life and governance. However, this research seeks to present the risk of reckless provision of religious exemptions. It will examine the ‘slippery slope’ effect through studies of case law like *Dobbs v Jackson Women’s Health Organisation* which is responsible for the overturning of *Roe v Wade* and thus demonstrate how excessive religious liberty may contribute to the deterioration of women’s rights in wider society. This research will employ the use of a philosophical framework in the form of a burden of proof, the burden will refer to anything that results in a restrictive load upon something. Overall, this research will assert that a state ceases to uphold gender equality when it allows exemption from anti discrimination legislation to religious groups and as such, current methods for burden analysis should be altered to account for a more holistic view of equality and the wider social impacts of religious exemptions



Development and Characterization of Biomimetic micropatterned surfaces

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Abstract

Biological systems serve as consistent beacons of inspiration to mimic optimized evolutionary design traits. Micro/nano-patterned surfaces have found increasing applications in various emerging technologies, however, the task of developing techniques to fabricate large areas of such surfaces in well-controlled and cost-effective manners remain challenging. Conventional microfabrication processes are costly and non-scalable, and thus this research aims to explore fluid-based patterning techniques which harness intrinsic self-assembling forces in an inherently energy-efficient process. This research is concerned with the microstructure found on the wings of the Cicada insects, which promote a wide range of enhanced material-functionality relating to hydrophobic and self-cleaning properties. These surfaces were successfully fabricated by coating the base solid surface with meta-stable polymeric film. The structure of the replicated surfaces was characterized using electron microscopy. The functionalities of these surfaces were then tested to evaluate the effectiveness of the technique, with the fabrications displaying a significant improvement in hydrophobicity from the original polymer surface. This work demonstrates a quick, efficient and cost-effective manner of patterning polymer surfaces, making it an effective way of fabricating micropatterned surfaces that possess key biological properties such as anti-reflection, anti-fouling and hydrophobicity. Following this research, the results can be used to manufacture materials in a scalable, cost-effective and adaptable manner, and this technology can be translated into real-world applications such as biomedical antibacterial coatings that aid in reducing fatal antimicrobial-resistant infections, optical communications, lenses, increasing the efficiency of photonics and the efficiency of solar cells.



"Why am I the witness?": Theatre and Representations of the AIDS Crisis

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Abstract

"Why am I the witness?" cries Mark, consumed by his survivor's guilt in Act Two of *Rent*. Throughout the musical, he struggles with the responsibility of memorialising his HIV-positive friends and wanting to represent them as alive, well, and living for love, despite their diagnosis. The AIDS crisis ravaged communities across the world, particularly the queer community, throughout the 1980s and 1990s. Theatre was quick to respond, using performance to educate, create a sense of community and criticise the lack of response to the crisis from governmental institutions but also from within the queer community itself. In doing so, theatre became an incredibly powerful way for artists to respond to the crisis, articulating their fears and giving a sense of togetherness to an alienated community. This research will critically examine representations of the AIDS crisis and those affected by it as depicted in theatre and TV through a close reading of the following examples: *The Normal Heart* by Larry Kramer, *Rent* by Jonathan Larson and *It's A Sin* by Russel T. Davies. Whilst these examples are undeniably powerful, my research asks whether they risk perpetuating harmful stereotypes about the crisis and whether the implications of these are problematic when re-staging AIDS theatre today. As opposed to restaging works created in the height of the crisis, this research ultimately asks whether it is more appropriate to call for a new approach to AIDS theatre, like Mark's in *Rent*, that centres themes of love, community, and, most importantly, life.



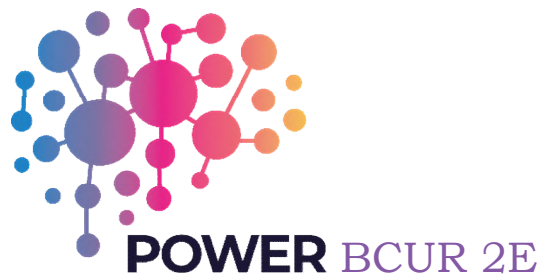
Misremembering events: do expectations of what is likely to happen result in a false recall of the endings of videos?

Sonia Domaradzka

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Abstract

We tend to remember events in our lives, as imperfect reconstructions of what has happened. In doing so, we use our previous knowledge and expectations, to make the most accurate guess of our reality, as events are unfolding. But do those predictions also strongly influence the formation of false memories, for things that we haven't in fact experienced? To test this, we designed an online experiment, in which our participants watched a set of videos of people performing everyday activities. Each video has been edited to cut out before the finish, and they were either predictable or unpredictable in nature. Then after a delay, we asked participants to describe all videos as accurately as possible. As expected, there was a significant effect of people falsely recalling additional information from predictable videos but not from the unpredictable videos. This means, that in real-life situations, people can misremember something as having happened if they have strong predictions about how the event might unfold. Our findings shed a light on how much our current expectations directly shape our memories, making us remember things we haven't observed. The outcomes of our research could be potentially used by memory experts in court. For example, the reliability of some eye-witness testimonies could be reviewed, to prevent misconduct of justice.



Caribbean Perspectives: Radical Decolonisation, Reparations and Re-Imagining the Anthropocene

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Abstract

For the Caribbean region, discussions of decolonisation and reparations must transcend academic discourse as they constitute veritable channels in securing political, economic and cultural sovereignty. This paper studies cases to redefine 'decolonisation' beyond a political process, re-imagine the critically current and Western hegemonic understanding of the 'Anthropocene' and root the Caribbean and its reparations endeavour at the centre of these radical interpretations.

The 'Anthropocene' is the modern epoch where human activity has environmentally altered the planet, with its origins in Britain at the advent of the Industrial Revolution. Using theoretical frameworks provided by Moore's 'Capitalocene' and Yusoff's 'A Billion Black Anthropocenes or none' and empirical evidence from Beckles 'Britain's Black Debt', this research unearths the Caribbean as the nucleus of global capitalism and the annihilation of black bodies. Utilising its thesis of the Caribbean Anthropocene account to critically analyse the region's Financial and Tourism sectors, this paper illuminates legacies of colonialism, arguing that Fanon's concept of violence should be imbued into the Caribbean quest for reparatory justice.

Centring the Caribbean in the Anthropocene account begins to dismantle the dominant discourse upholding Western hegemony. Furthermore, applying a 21st century reading of Fanonian violence to the Caribbean reparation endeavour demonstrates how reparatory justice is necessary for all-encompassing sovereignty for the region.

This paper provides a sound justification for radical decolonisation aided by reparations, through the advancement of a holistic interpretation of the Caribbean. Thereby, positioning itself as solid basis for pursuing reparatory compensation through substantial means.



Does the Disability Pay Gap Exacerbate the Gender Pay Gap in the UK Labour Market?

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Abstract

Discriminatory pay gaps are well documented in the literature. While these disparities are declining, they are still very prevalent today. However, often under-explored is intersectional discriminatory pay gaps. What this means is the impact on pay when a worker falls into several discriminatory groups. This work looks deeper into the relationship between disability and gender and whether this impacts pay cumulatively or whether there is an interaction term that additionally compounds the impact. Using the Annual Population Survey, covering a span of the last 20 years, I will complete an OLS regression to estimate annual earnings given gender and disability status. Preliminary results suggest there is an interactive term. Using a disabled women as an example, this woman experiences pay discrimination because she is a woman, because she is disabled, but also an additional impact from being a 'disabled woman'. This suggests pay discrimination is not cumulative, but cumulative and intersectional. This research helps develop our understanding of pay discrimination which directly impacts public policy. If pay discrimination has an intersectional element as well as an element from individual characteristics, then policy needs to directly address both individual characteristics and intersectional groups. This research covers the intersection of gender and disability, however there are many more combinations of characteristics to be considered by further research. Results permitting, this provides evidence that discrimination in society needs to be addressed at an intersectional level and addressing individual groups is limiting in solving the problem of discrimination.



Examining disparities between rates of clinical diagnoses of binge-type eating disorders in 'White' and 'Minoritised Ethnic' participants.

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Abstract

Binge-type eating disorders (such as bulimia nervosa, and binge-eating disorder) account for 41% of the total lifetime prevalence of eating disorders in the UK, and detrimentally affect individuals from a young age, stressing the importance of their diagnosis. However, several articles in the wider clinical literature have highlighted the vast ethnic inequalities in relation to the access to and quality of healthcare in the UK. Therefore, this project aims to look at whether having a non-white ethnic background in the UK, and therefore having a non-mainstream cultural experience of mental health and medical services, impacts the incidence and rates of diagnoses of binge-type eating disorders. Analysing pre-existing survey data from the GLAD, EDGI UK and COPING studies led to the conclusion that there is no significant difference between the strikingly low rates of clinical diagnoses in 'White' (23.67%) and 'Minoritised Ethnic' (20.65%) data. This non-significant finding is potentially borne of the low statistical power of the 'Minoritised Ethnic' group data, due to the small sample size; this highlights the need to improve sample diversity, to ultimately produce results that can influence the way in which individuals within 'Minoritised Ethnicities' are assessed by healthcare professionals for binge-type eating disorders. Hence, a replication of this study in a sample with an increased number of 'Minoritised Ethnic' participants would be appropriate to reassess the findings of this project.

It is of note that this project also discusses the use of appropriate ethnicity-related terminology when conducting and publishing scientific research.



An investigation into the perceived value of hard and soft skills in project management teams, “post” pandemic.

Christine O'Hara
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Abstract

This research investigates the value of hard and soft skills within project management teams. This critical review will look to comprehend the key terms, how they have evolved during the pandemic and what this means for future employability in project management teams. The COVID-19 pandemic has had a substantial impact on the work environment and what that means for the project management sector. The understanding of the value of soft and hard skills have changed over time, and their understanding is important. To help to establish the gaps in our understanding, key theories and examples are highlighted throughout and analysis provided. Data is collected from project management teams whereby they assess leaderships in these people and their perceived value. The pandemic has meant that many different organisation have had to adapt their work environment and project management teams. This research fills a gap by informing organisations what differences in current working environment are valued most in project management teams, post pandemic. This research helps to inform the project management field areas and competencies that can and should be developed in a post-pandemic work environment.



Novel Transcriptional Targets that underpin CD44-regulated breast tumor cell invasion

Asil Abou Ajoue, Salma Ahmad, Nour Alateyah, Reem Ahmed, Zainah Doukmak, Hanan Nazar, Allal Ouhtit, Muna Yusuf

Qatar University, Doha, Qatar

Abstract

Background: Using validated CD44-inducible breast cancer (BC) cell line, we have previously reported that activation of the CD44 receptor via its major ligand hyaluronan (HA) promoted BC cell invasion in vitro and metastasis to the liver in vivo. To identify CD44- downstream targets mediating BC cell invasion, microarray analysis was carried out. Among more than 200 target genes, three including; Cortactin, Survivin, and TGF- β 2 have already been validated as novel CD44-target genes along with their underlying signaling pathways in promoting BC cell invasion. In the present study, additional genes (AHR, ICAP-1, SIRT1, SRSF8, SOD2, PRAD1, KYNU) were selected for further validation.

Methods: First, RT-PCR and Western Blot analyses were carried out to determine whether these genes are true transcriptional targets of CD44/HA-downstream signaling at both RNA and Protein levels, respectively. Second, these genes were validated, functionally, using wound-healing and invasion Boyden chamber assays, following transfection of BC cell lines with specific siRNA for each target.

Results: Our results revealed that HA-activated CD44 increased the RNA expression levels of its seven potential transcriptional targets, while inhibition of CD44 by siRNA significantly decreased the levels of expression of these target genes. In addition, inhibition of the seven target genes by their specific siRNA inhibited both migration and invasion of BC cell lines.

Conclusion: Our findings suggest that all seven genes are true targets of CD44-promoted BC cell invasion. Furthermore, ongoing molecular approaches, aim to dismantle the exact signaling pathways linking the activation of CD44 by HA to the transcription of its targets.



Application of a Pre-Consultation Adherence Screener in a Geriatric Outpatient Setting

Aiman Ibrahim, Jennifer Stevenson, John Weinman
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Abstract

Up to 75% of older adults show non-adherence in medication use. Often suffering from multiple co-morbidities this heightens their risk of poor clinical and functional outcomes, adding to the healthcare economic burden. Identifying and tackling non-adherence is often difficult in clinical practice especially using direct questioning displaying patients' reluctance in 'admitting' to non-adherence

Over a 6-week period patients at the OPAU (Older persons assessment unit) at Guys hospital London were invited to complete the making medicines work for you (MMWFY) questionnaire. This included filling out two previously approved adherence measures, the MARS-5 (Medication adherence report scale) and a modified version of the BMQ (Belief about medicines) tool. Descriptive analysis was then performed to look at incidence of adherence compared to the the MARS-5 and BMQ.

Using previously applied cut off points the MMWFY screener showed 54.2% of the cohort is non-adherent and have at least one issue with their medicines. This is similar to other older people adherence studies on cardioprotective medications where non-adherence ranged from 40-67%. The results also showed that 21.9% of patients had queries about their medications which were mainly regarding side effects and confusion around prescription instructions.

Overall, this pilot study demonstrates a large proportion of older adults having issues with their medicines. The MMWFY screener is extremely useful in eliciting these concerns in more 'subtle' ways and has been shown to be comparable with existing measures of adherence. It often led to conversations regarding medicine use, showing potential in encouraging adherence discussions with healthcare staff.



Methane in the Polish hard coal mining sector. Sources of emissions and reporting systems

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¹*Instrat Foundation, Warsaw, Poland.* ²*University of Warwick, Coventry, United Kingdom*

Abstract

The paper is the first such comprehensive overview of the methane emissions data in the coal mining industry in Poland. It is also the second report focusing on that country and the first one to assess the impact of the new EU legislation. The research aims to seek solutions to problems of transparency of emission reporting and provide a framework for a better pricing system. It draws on existing scholarship on methane emissions and their social and economic costs. It originates from previous work by the authors in collecting and publishing financial and environmental data on the Polish mining sector as part of the energy.instrat.pl project. The authors rely on interdisciplinary methodologies stemming from environmental economics and policy analysis. The key findings are striking discrepancies between the reporting systems, a tragic lack of transparency, and the unsettling inadequacy of the current methane pricing. These findings empower civil society to demand adequate policy change that is additionally implicated by the EU methane legislation in the two key areas of methane reporting and pricing. The report champions two distinct policy propositions. The first one is focused on enhancing the mandate of industry watchdog organizations to empower them to verify conflicting reports from coal mining corporations. The second one provides a scalable pricing mechanism that would provide an incentive for the business to innovate. The proposed solutions would fill the gaps in data and contribute to climate change mitigation while supporting just transition of the energy industry.



Measuring Fear of Crime in High and Low Deprivation Areas, Using GOV.UK's Indices of Deprivation.

Luke Basford

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Abstract

This research aims to increase understanding of the link between deprivation and fear of crime. Previous research shows environmental factors such as graffiti or litter, alongside social drivers such as gangs 'hanging around' can increase a person's fear of crime within the UK (Lorenc et al., 2013), in addition to contributing to local community deprivation. Therefore, it was hypothesised that those who identified themselves as living in more deprived areas, would have a higher fear of crime than those living in a less deprived area. 123 participants completed a questionnaire comprised of 20 Likert scale questions relating to their local area to explore the above. In addition, anonymised postcode information was inputted into GOV.UK Indices Of Deprivation 2019 Postcode Lookup, to generate a deprivation score for their local area to compare to the survey results. This placed 63 participants in high-deprivation areas and 60 participants in low-deprivation areas across the UK. The research shows a significant difference between residents of high-deprivation areas and low-deprivation areas and their fear of crime. This research allows us to understand the impact of deprivation in local communities, and how indicators of deprivation can increase feelings of fear. Understanding the environmental and social factors of deprivation in different local areas, insights and actions can be taken to produce a community-specific approach to reduce deprivation and fear. This research can aid in understanding areas higher policing is required, as well as rehabilitation and community-based programmes to reduce crime based on the needs of each local area.



The Unknown Alchemy of Labour and Birth: a Review of Longitudinal Birth Cohort Studies

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Abstract

The 'Barker Hypothesis' links lifelong impacts of chronic disease to the clinical, nutritional and environmental events that occur during pregnancy, labour and childbirth (Barker, 2003). In this respect, a significant number of longitudinal birth cohort studies operate worldwide. However, very few studies collect data on 1) place of birth and 2) interventions between the period of labour and delivery (i.e., intrapartum period). The aim of this review was to identify all existing birth cohort studies with data collection protocols that recorded, as a minimum, mode of birth and at least one human tissue sample (saliva, blood, faeces, hair or placenta) in the postpartum period and to create a study synopsis. My role within the team was to carry out the methodology, which consisted of two main stages: gathering data from www.birthcohorts.net and contacting Principal Investigators with queries related to intrapartum data and biological samples. Inclusion criteria were longitudinal studies that included childbearing women, where recruitment started before or during pregnancy, or at the time of birth. We identified 67 existing birth cohorts that included both intrapartum data and tissue samples from 27 countries. Additionally, we collected information about the place of birth and existing microbiomial and epigenetic analyses undertaken on these data sets. We have identified very few cohorts that collected data from home births. By providing contact details and accessibility conditions for these cohorts and their associated data and analyses (genetic, epigenetic and microbiome) we hope to increase the potential for further research across existing and future birth cohorts.



Development of a non-invasive test to detect Lynch-syndrome-associated urinary tract cancers.

Rashi Krishna

Newcastle University, Newcastle Upon Tyne, United Kingdom

Abstract

Lynch syndrome (LS) is a genetic condition that increases likelihood of developing a range of cancers. In the UK, it affects approximately 1 in 300 people, with only 5% cases clinically diagnosed. Upper Tract Urothelial Carcinoma (UTUC) is a urinary tract cancer and the 3rd most common tumour associated with LS. Due to its elevated risk and high recurrence rates, early detection of UTUCs is clinically desirable, but no adequate, non-invasive tests are presently available.

My research aimed to enhance a test developed by researchers at Newcastle University, that detects genetic changes within LS patients, by integrating detection of commonly mutated genes seen in UTUCs. 11 frequently mutated regions across 7 genes were assessed in 10 tumour and 10 urine samples from urothelial cancer patients. To establish the best suited methodology to detect mutations within poor quality DNA samples like urine, a comparison between two editions of the test was conducted.

Results indicated that further test development should include target regions detecting mutations within genes like FGFR3, PIK3CA, ADGRG6 and KRAS. Incorporating the targets into the latest edition of the test would provide a better alternative to using the older edition, as it is a faster, cheaper, easier and more sensitive version of the test to effectively assess patient urine samples. The long-term goal of developing a simple and cost-effective test which can identify genetic changes non-invasively, would ideally be for early detection of UTUCs within LS patients and potentially non-LS patients, to improve overall urothelial cancer patient care.



A systematic review of the diagnostic performance of CT scans as a first-line investigation in the diagnosis and assessment of Covid-19.

Mahmuud Mohamed, Adeel Zaman
University of Warwick, Coventry, United Kingdom

Abstract

Methods

The methodology followed a PRISMA tool. Medline, Embase and Web of Science were searched in October 2022 using key search terms, studies were included based on specific inclusion criteria formed using a population, intervention, comparison, outcome (PICO) criteria. The studies were critically appraised and key information such as the diagnostic accuracy, sensitivity/specificity was extracted for a narrative systematic review to be performed.

Results

Sixteen primary research diagnostic accuracy studies were included, these were matched to ensure all diagnostic tests took place in an acute setting; less than 2 weeks from symptom onset. The diagnostic accuracy for CT scans for the diagnosis of COVID-19 ranged from 53.3% to 96.69%. The reported sensitivities ranged from 68.8% to 100% and the reported specificities of CT scans ranged from 26.2% to 96%.

Conclusion

CT shows promising use as a first-line investigation however, due to the limited available data on the cost effectiveness of more routine use of CT, and the limited data on the diagnostic performance of chest x-rays for COVID-19 diagnosis, we were unable to confidently state whether implementing CT scans as a first line tool is practical or whether the difference in diagnostic performance between CT and chest x-rays is significant enough to warrant a shift in practice. This review therefore concluded that CT remains an auxiliary tool in the investigation of COVID-19.



Differences in Morality, Empathy, and Resilience to Moral Distress, Considering Changes Over Time, Amongst Registered Healthcare Professionals in the UK

Nicola Lingley-Heath

Keele University, Newcastle-under-Lyme, United Kingdom

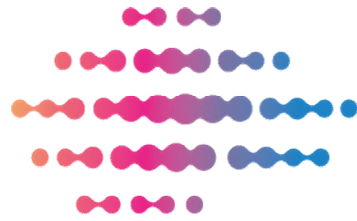
Abstract

Morality and empathy are fundamental in human nature. Moral distress is the suffering from having to make a decision against moral and ethical values. The term is used in healthcare when unable to achieve individual moral obligations to patients. It is inevitable that HCPs working with patients in a clinical environment may be exposed to morally distressing situations, therefore research should explore individual perceptions of moral distress, and the experiences that augment it.

Nurses, Operating Department Practitioners (ODPs), and Physio/Occupational Therapists (PT/OTs) in the UK were recruited to take part in an online cross-sectional survey. Participants (n=234) were asked demographic information, and questions to measure morality (utilitarianism), moral distress, and empathy.

Three Analyses of Variance (ANCOVA) were conducted, looking for differences between professions in: utilitarianism, moral distress levels, and empathy levels, while controlling for the length of service. There was no significant effect of profession on levels of moral distress, empathy levels, or utilitarian endorsement. Nurses reported the highest levels of moral distress (M = 131.11, SD = 63.26), PT/OTs scored the highest levels of empathy (M = 2.45, SD = 0.33), and PT/OTs ranked highest for utilitarianism (M = 2.82, SD = 0.46).

This study has the potential to inform clinical practice, with suggested strategies to reduce and manage the effect of moral distress for HCPs. A follow-up project is planned to develop a 'Moral Distress Toolkit', accessible to HCPs in clinical practice, to hopefully aid the management of moral distress.



• THE FUTURE BCUR 3B

BCUR046
The Future

Revisiting the Work From Home Efficiency Question, With a Focus on Personality Traits.

Duc Nguyen

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Abstract

This paper is motivated by the increased adoption of WFH due to Covid-19, which will leave a lasting impact on post-pandemic working arrangements (Barrero et al. 2021b). Understanding the factors that improve WFH efficiency is therefore important for future WFH policy implementation. The objective of this paper is therefore to analyse how personality traits affect relative efficiency of working from home (WFH) compared to working on premises. The findings on whether WFH increases efficiency are mixed but the benefits are more widely documented (Hackney et al. 2022). However, personality traits are often overlooked by institutions and academics when assessing WFH efficiency due to a lack of data. Therefore, this paper contributes to the literature by examining how the Big 5 personality traits affect WFH efficiency by leveraging a repeated pooled-cross-sectional USA individual-level dataset with over 2,400 observations collected following global lockdowns. The paper also categorises personality traits in three different ways to create a more intuitive interpretation of different personality trait levels. The results show that how the traits are categorised has a significant impact on the interpretation. Using ordinal logistic regression and controlling for individual heterogeneity, my model shows that agreeableness has a strong negative correlation with WFH efficiency relative to office premises across three categorisations. The results are less clear for the other traits.



Cognitive offloading expectation on word concreteness effect

Yi Ching Victoria Lai

City University of Hong Kong, Hong Kong

Abstract

Cognitive offloading (CO) is the behavior to reduce cognitive demand of a task, like jotting notes. It is found that the mere expectation of having the opportunity to CO could be able to harm their memory performance, explained by the intentional forgetting mechanism. Nonetheless, not much research has been done about how CO affects lexical processing system. Highly imaginable concrete words are recalled better than abstract words when processed deeply. This study aims to investigate the impact of CO expectation on word concreteness effect. Hypothesis: expected access to typed notes on computer will result in less encoding effort, so the concreteness effect could no longer be maintained. 2 (Concrete vs Abstract words) x 2 (Access to typed notes: Expected and Unexpected) within-subjects design is adopted. 40 undergraduates, with at least level 4 HKDSE English are instructed to type and remember words shown on the computer screen. For expected condition, they are told that the typed notes are not available before the encoding stage. For the unexpected condition, they are told that notes are not available only moments before the recall phrase. Without referring to the typed notes, participants do a free recall. The number of correct recalls is recorded. Two-way repeated measures ANOVA is used to analyze the data. By exploring word concreteness, more evidence could support previous research that cognitive offloading may or may not affect some aspects of our memory, i.e. memory that relies on semantic processing, helping to understand the possible benefits or drawbacks of CO.



The need for refugee and asylum-seeker healthcare in the undergraduate medical curriculum

Rajeshwari Pittala, Jacob Wright
King's College London, London, United Kingdom

Abstract

Introduction:

It is important that clinicians are well equipped to treat underserved populations such as refugees and asylum seekers to make healthcare more accessible and equitable. The number of refugees and asylum seekers is on the rise globally due to socioeconomic instability. This population of patients have unique health needs due to potential trauma. These experiences and institutional barriers contribute to a growing lack of access to healthcare across the world which eventually results in adverse health outcomes. This study examines the need for refugee and asylum seeker healthcare in the undergraduate curriculum in order to tackle these challenges early on.

Methods and Results:

This mixed-method study incorporated a scoping review of literature, following the PRISMA guidelines which showed the need for refugee health in the undergraduate medical curriculum globally. Interviews with educators revealed that they believed refugee health is important to teach and that they found fulfilment when advocating equity. A survey of undergraduate medical students showed that although they had a good knowledge of underserved populations, they lacked the confidence and skills required to treat their needs.

Discussion and Conclusion:

This study is the first to examine this topic through the lens of educators and students and contributes to current literature which advocates for the integrated teaching on refugee health in the undergraduate curriculum. Future work should focus on implementing changes and incorporating the views of refugees to design a curriculum which is inclusive and accurate.

**COMMUNITY** BCUR 3CBCUR049
Community

Do speakers of grammatically-gendered languages have a binary view of human gender?

Neve Francis

*Newcastle University, Newcastle Upon Tyne, United Kingdom***Abstract**

My research looks at whether native speakers of grammatically-gendered languages are, in turn, more likely to have a binary view of human gender itself. Looking at Spanish and English, I have conducted research via a short online questionnaire collecting basic data cross-sections of participants as well as posing the question ‘Do you agree with the statement that gender is binary?’ in which they responded with either Yes or No.

I investigate how the grammar of the native language we speak has a direct link to the way we experience and view the world and people around us since language itself is how we make sense of the world- for example, Spanish speakers were found to be more likely to state ‘yes’ than English speakers.

The wider importance is to further understand how language itself can play a major part in a person’s values and acceptance, including inclusivity towards those who identify outside the gender binary. In our current society, the notion of gender is nuanced and complex, this research holds importance in a wider context of sociology and within our communities as a whole. Previous researchers have discovered that speakers of grammatically-gendered languages describe nouns in accordance to the ‘gender’ marker of the word in their native tongue, e.g. bridge in Spanish being described as strong, but elegant in German. My research will go one step further to discover whether our acceptance and recognition of non-conforming gender identities are somewhat linked to how our native language marks gender.



Introversion or Extroversion: The Adaptation of LSE Students to Online Learning

Sylvia Naneva, H el ene Sentuc, Amneet Nandra, Jingtong Lu, Theerisara Silaphatkul, Anzhen Gu, Hei Tong Tang
London School of Economics and Political Science, London, United Kingdom

Abstract

Traits of introversion or extroversion influence adaptation to social change. The transition to online learning has changed the feelings, social experiences and academic performances of university students. Though studies have analysed social demographics, no studies have looked at how personality has influenced this adaptation. Thus, we ask the question: How do traits of introversion or extroversion influence the adaptation of LSE students to online learning? Based on our literature review, we hypothesise that extroverted students are likely to better adapt to online learning. We use a survey and regression analysis, complemented by interviews, to test for this hypothesis. Overall, our findings confirm that extroverted students adapt more positively. Controlling for individual characteristics, we find a positive relation between introversion and loneliness and a negative relation between introversion and motivation to study. We discovered two interesting findings: introverted students feel more included in the LSE community and understand the course content better compared to extroverted students online. Our research contributes to existing personality theories and the ever growing literature on the 'new' post-covid world. Our unexpected findings however challenge the status quo and urge for further research into how introverts and extroverts respond to social change. At most, we hope our findings inform the LSE and the higher education sector with a new perspective on improving wellbeing, networking, and teaching services.



The Imminent Caliphate

Umar Majeed

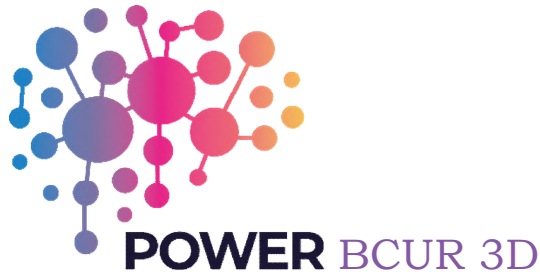
University Of Warwick, Coventry, United Kingdom

Abstract

My project is a book surrounding the Islamic Empires of the past, creating many comparative lines of thought with that of the current geopolitical situation of the Muslim World. Thus, it has the underlying purpose of reviving a hidden ethos of pride within integrated Western Muslims, especially amongst the youth, many of whom no longer see the significance of the wider tradition. However, the primary audience extends more broadly to all who wish to learn about one of the greatest Super Powers to dominate the global political arena for many centuries. Throughout my research I have used at my disposal, a variety of primary sources and contemporary books, all of which contributed to the political theory which I have compiled. Thus, it takes into consideration a variety of thematics, including history, theology, politics, psychology and philosophy. All of these factors are drawn upon to reach a balanced solution, which falls as a critical legal theory of its own, surrounding my Five Stage Societal Theory.

Especially due to false media reports surrounding this topic, it has become a taboo in our society, thus it is my role to redress the very definition of a “Caliphate”, in order to return to orthodoxy and traditionality, thus creating an informative dialogue in the Western World, in an area where ignorance is rife.

Essentially, I aim to create a relatable and accessible piece of work, which dissects complex events and ideas to form an interactive dialogue, with all those who hold an interest.



BCUR052
Power

Parallel Braids: Idealized homonormativity and the otherization of Transgressive gay Identities in US Public Discourse.

Shreshth Jain-Hutchison
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Abstract

Representation matters! This acknowledgement has reshaped the discourse on mass media in the 21st century. But is all representation good representation? This paper contrasts the idealized image of a gay man constructed by the US's popular discourse with firsthand accounts of intersectionally marginalized gay men who deviate from that ideal and analyzes them through secondary research on essential facets of gay male identities. Combining Jose Jorge Medina's theory of a braid of whiteness in which three distinct strands interweave to create an identity that cannot be truly understood as simply a sum of its parts with Lisa Duggan's conception of the homonormative, this paper constructs a more comprehensive theory of gay identity that allows for communal identity while still leaving space for diversity. This theory consists of three strands - physical aesthetic, gendered performativity, and socio-political goals - which intertwine to form two parallel braids of identity, one given prominence in national discourse which features the gay archetype reflected by figures like Anderson Cooper, and one pushed to the margins, consisting of those who cannot, or do not, conform along each of three strands. By asking not just if gay men are being represented in media, but how they are being represented and what effect these representations have on those that they do not reflect, this theory allows us to see that even in our supposedly inclusive culture, gay men are being excluded; if not for being gay, then for being gay the wrong way.



India's Genderscape: "A Lonely Battle for Justice" (BBC, 2015): Unpacking the Discursive Struggle to Criminalize Marital Rape in India

Salwa Mansuri

University College London, London, United Kingdom

Abstract

At 18 I understood that people swarmed onto the streets with candles to demand justice for the brutal rape of 22-year-old Jyoti Singh, sparking "knee-jerk reforms" in criminal law (Brereton, 2016, p.41). Yet, at 22, I fail to comprehend the Supreme Court's dismissal of a petition filed by a marital rape survivor to criminalize marital rape. For a woman, justice is served. For a wife, it is far-fetched. Women's voices, sexual and bodily autonomy have been marginalized from the scholarly debate as much as they have from the empirical. Contemporary literature on the criminalization of marital rape in India is state-centric and neoliberal feminist that construct Indian women as helpless and in need of protection. Despite colonial roots of the marital rape exemption a post-colonial feminist response to the criminalization of marital rape in India is lacking. My contribution is two-fold: Theoretically, I evaluate the double and discursive marginalization of resistant discourses sexual and bodily autonomy by powerful neo-colonial and patriarchal discourses. Empirically, I explain the resistance to criminalize marital rape despite overwhelming domestic and international pressure (see Ghosh, 2020 & Kim 2017). Broadly, I argue that Indian Women are not inherently silent, submissive and subservient but their voices, have been doubly and discursively marginalized by patriarchy and colonialism alike. Beyond, visible forms of direct violence such as marital rape, I hope to encourage discursive exploration of structural violence (Tickner, 1994) and the double marginalization of Third World women's voices, in oppressive genderscapes in the Global South.



Big Strong Girls: Who are we Talking About When we Talk About "Strong Women"?

Alice Duncan

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Abstract

Language as a practice forms the central tenet for constructing and maintaining our social reality. As such, the way social groups are linguistically represented is critical. This research aims to identify how representations of men and women as physically strong are different. Examining specification, minimisation and maximisation, reveals stark contrasts in whose power is represented, and maintained. A corpus investigation (using Web EnTenTen2020) into adjective collocates, words that frequently appear together, of men's/women's strength illustrates a statistically significant inequality in types of strength and who is represented as being emotionally, physically or mentally strong. With the corpus findings in mind, a series of metalinguistic interviews, where subjects comment on their own language use, were then conducted with female powerlifters at the AWPLU championships. The data provided, which gives a primary insight from strong women around how they speak about themselves and are spoken to, is also analysed for covert bias. Despite an explicit desire to uphold and celebrate women who are actively pursuing physical strength, often over weight loss, transcript data reveals frequent minimisation and classification of "women's strength".

These linguistic constructions seem so innocuous they go unnoticed by the casual observer. However lack of representation can cause very real harm to minoritised groups. With this specific field of physical strength, that harm is observable and measurable. Asymmetric language misrepresents, isolates and excludes women from physical exercise; an undeniably healthy pursuit. Research such as this helps to highlight gender inequality to begin the process of deconstruction.



WebCM: A Web-Based Platform for Modelling Multicellular Simulations

Jason Philippou

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Abstract

WebCM is a web platform that enables users to create, edit, and view multi-cellular simulations on the cloud. WebCM builds upon an existing simulation tool called CellModeller. While this tool allowed you to easily run a variety of simulations, it had a limited user interface and users could only run simulations on their own machines. This meant that users who had lower-end hardware and wanted to run large simulations would have to wait a very long time for their simulation to complete. WebCM moves CellModeller to the cloud, allowing users to run simulations on remote machines, such as powerful servers. It also provides users with a better user interface. Not only is the interface faster and more intuitive, but it also provides users with a built-in code editor, enabling simulations to be modified on-the-fly. WebCM was also designed to be deployed in a lab environment, allowing users to run multiple simulations concurrently and share a single machine instead of each user having to have their own.



A Data Driven Material Requirements Planning Tool for Manufacturing

Joe Wright

Blackpool & the Fylde College, Blackpool, United Kingdom

Abstract

Planning the flow of materials is a critical aspect of any manufacturer (Vihijärvi, 2019). With the increasing complexity of modern supply chains, the importance of correctly controlling this process has also increased. Multiple theories to manage this process exist, ranging in complexity (Romero-Gelvez et al., 2019, p. 95). However, although studies have used data science in combination with these theories (Rauf et al., 2020), there is a lack of conclusive data in the literature. Armac Martin is a manufacturer of make-to-order kitchen hardware, that currently struggles to meet demand due to a poor requirement planning system and will be used as the subject here.

The paper will apply a range of predictive analytical methodologies to the businesses' dataset, with the goal of accurately forecasting demand. The forecasted results will be included in the current requirements planning algorithm, which will then be evaluated through a simulation of historical operations. The output of this simulated model will be statistically compared against the actual performance of Armac Martin over this period. If the application of data science has been successful, the proposed model should increase on-time delivery while minimising the level of stock held at any given time, adhering to lean methodology (Saad, 2018; Elsharydah, Michaelis A. and Rajan, 2020).

This research has strong implications for all manufacturers, particularly those who specialise in make-to-order products. If successful, it demonstrates businesses can potentially enhance their existing planning systems without migrating to different algorithms or software, thus reducing expenses and risk.



What themes are present in photographic advertisements printed in British *Vogue* during the Second World War?

Karolina Glasek
University of Leeds, Leeds, United Kingdom

Abstract

For my dissertation, I am researching the themes and messages present in women's magazines in Britain during WWII by looking at the advertisements containing photographs. I am looking at British *Vogue* because the existing secondary literature centres mainly on American magazines; therefore, it would be interesting to see how the situation in both countries differed. As a Social Historian, I like to see the influence that past events had on ordinary people; hence, my focus on the mass medium. This research is important because it shows the messages the media was trying to send, while often working with the government.

I will sample several issues of *Vogue* from each year. After reading some secondary literature, which analysed the themes present in American magazines, I am hoping to see whether or not a similar pattern occurs in my data. I will also contextualise the data by looking at local events.

These findings will contribute to the field of History as very little has been written on women's magazines during the period, with most of the literature focusing on the United States.

In the future, I would like to continue my research by analysing different women's magazines to spot editorial differences. I would also like to look at the French and American editions of *Vogue* to see how local contexts influenced the media. I am hoping that my research will shine light on women's magazines as valuable sources, not just for their textual content, but also their photographs.



The Van Gogh Project: The Impact of Van Gogh on people and places

Aurore Charron

University of Warwick, Coventry, United Kingdom

Abstract

My research explores Van Gogh's impact on people and places. This piece of Oral History deals with memory and community through a sociological approach. As an aspiring journalist, I dealt with this project as an opportunity to undertake fieldwork, interviews, and create a video report. My project centers around the question of how artist impact their environment through the lens of Van Gogh.

This work relies on a mix of document research and fieldwork. I traveled to Auvers (France), Antwerp (Belgium), as well as Zundert and its Brabant area (Netherlands). This allowed me to visit places of memory, and interview inhabitants and experts. I found that smaller cities tend to have a closer relationship with artists who marked their landscapes. This imprint appears more subtle in bigger cities. Connections between places depend on geographical and cultural features, but also luck and initiatives of the people.

My research focuses on recovering histories that connect people to their environment: whether they be inhabitants, tourists, or experts. It takes a multilingual angle by coupling different cultures and languages into one project. A crucial timing given Britain's current relationship with the EU.

I produced a video report, and I am working on a longer version to be showcased in the tourism offices of Auvers, and hopefully Anvers and Zundert. This could be a tool to link cultures and reinforce longstanding connections. Given its international approach, showcasing my work at the WCUR-BCUR would be a great opportunity to reach a wider audience.



Effects of US-China Cyber Rivalry on International Trade and Politics

Victor Nzioka

University of Portsmouth, Portsmouth, United Kingdom

Abstract

This research will focus on how the cyber-rivalry security between the United States and China have impacted global trade and politics. It will explore the Washington-Beijing relations; China's increasing global dominance, threatening America's superpower position, thus leading to cyber espionage between the two states that has caused volatility in the global trade and international politics.

The information used in this research was obtained from both print and electronic sources including journal articles, books, newspapers, relevant webpages of key governmental and international organisations, YouTube videos, documentaries as well as podcasts and knowledge from faculty members that are well conversant in this field. This cyber warfare has resulted in the theft of corporate and individual financial information, reputational damage of companies, thus affecting global trade. China is allegedly accused influencing voters' decisions in the 2016 US Presidential elections through social media targeting.

This research will aim to explain the economic implications this cyber warfare has caused including the US-China trade war and how it affects international markets and stability. This rivalry may impact on global peace and security due to the economic instability resulted by this 'Cold War' between China and the United States.

This research aims to further advance the understanding of how to mitigate the economic, social and political impacts of this cyber warfare both at the local and international levels. The findings will be useful in furthering any research on the subject by academicians, security, political and economic analysts.



SUSTAINABILITY BCUR 3G

BCUR060
Sustainability

The Impact of Sustainable Human Resource Management has on Employee Turnover: A Case of the Hospitality Industry (UK)

Nicole Shrives
University of Plymouth, United Kingdom

Abstract

Employee turnover in the hospitality industry is at its highest with restaurants and cafes showing the lowest levels of staff retention. This has a negative impact upon organisational performance and costs businesses time, money and productivity. This research seeks to reduce employee turnover by investigating the drivers of job satisfaction and identifying what sustainable human resource management (SHRM) practices could improve satisfaction (therefore turnover rates). Many researchers have discussed how employee turnover is linked to job satisfaction and offer perspective. None thus far have specifically focused on the implementation of SHRM practices.

Herzberg's Two Factor Model has been previously used to identify the factors in a work environment that causes job satisfaction (motivational factors) or dissatisfaction (hygiene factors). This research collects data through quantitative questionnaires from cafe and restaurant employees through convenience and snow-ball sampling method. The findings show us the causes of employee satisfaction and dissatisfaction. They also indicate which SHRM practices need to be focused on to improve job satisfaction and reduce employee turnover.

This research has both academic and practical implications. It fills in a literature gap to examine the impact of SHRM on employee turnover within the hospitality industry. It also promotes SHRM and proposes practices to reduce employee turnover within the hospitality industry. It paves a way for sustainable human resource management and could be transferable to other industries.



Implications of the Non-Identity Problem for Climate Change Policy

Roman Irven

University of Warwick, Coventry, United Kingdom

Abstract

Derek Parfit's Non-Identity problem concerns our moral responsibility toward specific future generations. A hypothetical absence of climate change mitigation has the potential to alter the direction of our lives drastically, and ultimately bring into existence individuals who would otherwise never have been alive. The concern, for Parfit, involves what we owe such people. Are they really harmed by the resulting climate breakdown when their existence is entirely dependent on it? If not, our duty to prevent climate breakdown must be found elsewhere. Through an exploration of the philosophy of time, my research will explore how we can still regard future generations as moral agents, and so still grant them political consideration, despite their conditional existence. Distinguishing between different sets of future generations, my research will explore more holistic understandings of harm which can form a foundation for our moral responsibility. Climate change, and what we owe to those who will live with the consequences, ask why it is immoral to act in specific self-serving ways. Since we believe that individuals are deserving of fundamental human rights, this is important. This research allows us to consider those impacted by the uncomfortable conclusions provided by Parfit. This research will add to the limited publications investigating the real-world impact of Parfit's work. Such work is extremely important in understanding how we must proceed in our climate breakdown prevention.



Modelling the Performance of 5G New Radio Waveforms with Channel Impairments

Zoe Benn

University of Sheffield, Sheffield, United Kingdom

Abstract

Multicarrier modulation schemes are standardised in most major wireless communications systems including WiFi, 4G and now 5G networks. The orthogonal frequency-division multiplexing waveforms possess a high peak to average power ratio, leaving the waveform prone to nonlinear distortion when passed through a power amplifier before transmission. Spectral growth of output frequency components can lead to unwanted interband interference.

To place the problem in context, consider two mobile operators (A and B) providing cellular services to a large city. If operators A and B own base stations 1 and 2, respectively, each transmitting on different frequency bands and in close proximity, it's imperative they do not cause interference to one another. If operator A's signal is distorted due to power amplifier nonlinearity, it may interfere with operator B's services. Such interference is forbidden by a regulator, for example, OFCOM.

An effective method to evaluate this problem was to develop a computer simulated model building up modulation schemes from first principle: BPSK, QPSK and 16-QAM, applied to a non-linear power amplifier. The project involved using the MATLAB programming tool to generate random binary data, applied to a nonlinear power amplifier model and then assessing the bit error and packet error rates at the amplifier output. The power spectrums showed how these errors affected system performance in terms of spectral regrowth. The aim was to find the relationship between signal power and out-of-band interference level and to compare the findings with current base station interchannel interference when transmitting video content.



Evaluating how Chinese national policy promote the intangible cultural heritage contributing to sustainable development and the existing dilemmas—using the Horsetail embroidery of Shui minority ethnic group in Guizhou Province as an example.

Xinyu Tuo

Keele University, Stoke on Trent, United Kingdom

Abstract

This research project aims to examine the contribution of Chinese Intangible Cultural Heritage (ICH) to sustainable development, while also exploring the existing dilemmas surrounding it by focusing on the Horsetail embroidery of the Shui minority ethnic group in Guizhou province. With Chinese national policies promoting the development of the ICHs, it has entered a period of rapid growth. In this new phase, many ICH companies, cooperatives and workshops are injecting new energy into sustainable development. However, there is still a lack of academic research focused on the impact of ICH on sustainable development and the challenges it faces. This research will analyse literature on ICH, interview local cooperatives, craftswomen and so on, drawing upon the experiences of other regions. It concludes that the ICH has a significant impact on improving the living conditions of rural women and promoting gender equality, but it also faces several challenges such as a lack of skilled talent, expensive production cycles, high production costs, and communication difficulties. Specifically, the horsetail embroidery is a handicraft, typically developed by women with limited educational opportunities, and they represent one of the most vulnerable groups in society. The development of ICH provides these women with opportunities for employment and has a significant impact on the protection of women's rights. Furthermore, the research provides readers with insights to understand modern China with a cultural standpoint. It also presents the dilemmas faced by Chinese rural women. Finally, the case of Chinese ICH equips a valuable research example for other regions.



Monstrosity and Othering: An exploration of the use of monsters and mythological beings as societally integrated groups in J.R.R. Tolkien's Middle Earth

Zachary Coleman

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Abstract

Last year I undertook an independent research project exploring the accusations of antisemitism around the goblins in Rowling's Harry Potter. This led me to theorise that the way writers use mythological beings has changed in the last hundred years. Whereas previously, literature used monsters as chaotic elements transgressing boundaries and causing chaos in human societal spaces, writers now use previously monstrous beings as societally integrated groups, meaning critics are more likely to identify these monsters as taking the place of other societal groups which are absent from the narrative. I believe this shift in the use of monstrous/mythical creatures was popularised by J.R.R. Tolkien. I wish to explore this with further research, but first I need to demonstrate that Tolkien uses monsters as societally integrated groups. I have explored J.R.R. Tolkien's Middle Earth novels, including the Lord of the Rings, the Hobbit, and the extended works edited by Christopher Tolkien, analysing the ways in which Tolkien uses orcs, elves, and other mythical beings. I have explored the works of Tolkien critics and scholars, as well as Tolkien's own letters to show the place these beings hold within Middle Earth. Once we understand how Tolkien uses the monstrous, we can explore how it compares with past and future fantastical works. While using the monstrous as societally integrated groups isn't necessarily bad, this research allows us to understand when the monstrous is taking the place of a marginalised group, and becoming (or interpreted as) offensive caricature.



Unravelling the anti-tumour effect of a novel treatment on pancreatic cancer

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Abstract

Pancreatic cancer (PaCa) is a devastating disease with an insidious onset and is often life-threatening at diagnosis. Fewer than 1 in 5 patients survive beyond a year after diagnosis. Not only has the survival rate not improved since the 1970s but the incidence of pancreatic cancer is increasing by approximately 1% per year. Even today, the curative treatments available for patients are slim; many are starting on end-of-life care from the time of diagnosis.

Our hypothesis is that a target cell receptor (Amd-2) facilitates cancer cell collagen growth and causes immune cells to invade the PaCa tissue. To prove this, we will determine the effect of our target cell receptor on PaCa growth in mouse models. More specifically, we will use tissue staining techniques to detect the effect of our treatment on the amount of collagen and the number of immune cells invading the PaCa tissue. We will compare the changes between mice given our new treatment, standard-of-care chemotherapy, or no treatment.

Our goal is to pioneer the innovation of new disease-altering PaCa medications. The results from this research will form a jigsaw piece that outlines the effect of the target receptor and helps to complete the puzzle of preclinical data that will push the development towards clinical trials.

By laying the foundation for future research to be built upon, we can strive one step closer to improving survival rates amongst PaCa patients and changing the poor prognosis that has haunted these patients for decades.



HEALTH BCUR 4B

BCUR066
Health

How can T cells help regenerate the brain in multiple sclerosis?

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Abstract

In multiple sclerosis, myelin sheaths around the axons are damaged during demyelination and oligodendrocytes are not always successful in repairing them, resulting in disease progression. Although there are no treatments for multiple sclerosis, it was shown that regulatory T cells can drive oligodendrocyte progenitor cell (OPC) differentiation and remyelination. However, very little is known about the mechanisms by which Tregs drive these processes. We identified MHC-II as molecule of interest, as it is involved in the traditional T-cell activation pathways.

As MHC-II is upregulated in the CNS by glial cells that are important for myelin regeneration, we hypothesized that MHC-II might be required for efficient OPC differentiation and remyelination; therefore, we aimed to investigate the expression of MHC-II throughout this process. We used an in vivo model of lysolecithin-induced demyelination in WT mice and stained by immunofluorescence for microglia, astrocytes, oligodendrocytes, and MHC-II at four different time points.

Based on the data collected, it was observed that microglia are the highest expressers of MHC-II at all time points, with a peak at 10-day-post-lesion. On the other hand, astrocytes and oligodendrocytes express low levels of MHC-II, suggesting that it may not be required for efficient myelin regeneration.

Understanding the localization of MHC-II expression could help to identify its role during remyelination and whether glia cells functions could be impaired in its absence. Investigating MHC-II expression could also help identify whether Treg immune responses coincide with upregulation, its role in remyelination and the development of potential therapies for Multiple Sclerosis.



Harnesses: too many choices: too little information

Lauren Dowdeswell

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Abstract

Dog harnesses are one of the most common walking aids used on pet dogs, alongside collars and head-collars. They are used for sports, and work working dogs. Numerous studies (Blake et al., 2019; Lafuente et al.) have investigated the biomechanical impact of harnesses on assistance/service dogs, vital for the canine sector as they rely on harnesses for their work. Research into harnesses for the pet dog is however absent and research on harnesses has provided conflicting evidence. Studies that have been completed (Grainger et al., 2016; Lafuente et al.) focussed on straight-front or y-front harnesses, but there are many other styles yet to be researched. This study aims to explore how different harnesses affect canine kinematics, including gait, forelimb angles and stride length. Dogs will be walked in front of high-speed cameras, which will pick up different kinematics for Quintic gait analysis. A standard lead and collar will be used as a control variable. The data obtained will be subjected to either an ANOVA or the Friedman Test. We hypothesise that there will be a significant difference in kinematics depending on the type of harness worn. This research will be indispensable for pet owners, as it will increase knowledge about different harnesses available in pet shops. This area of research will need more focus as the canine industry progresses because it has been shown that harness can increase the risk of osteoarthritis and other musculoskeletal disorders (Anderson et al., 2020; Fitzpatrick et al)



The use of Diuretics in Cardiorenal Syndrome

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Abstract

Title: A systematic literature review of the use of diuretics in cardiorenal syndrome (CRS) **Background:** CRS is an umbrella term for disorders involving both the heart and kidneys in which acute or chronic dysfunction in one organ may induce dysfunction in the other. Diuretics are one of the mainstay treatments of CRS, however there is currently no current guidelines for diuretics in CRS with hesitancy to prescribing of diuretics due to fears of worsening renal function. This review aims to identify if use of diuretics in CRS reduces all-cause mortality. Secondary objectives include to assess if diuretics in CRS, reduce hospitalisations, preserve renal function.

Methods: Inclusion criteria includes adults with CRS. Studies only published in the English language and those with a population greater than 50. A systematic search was conducted via Medline, Embase and Cochrane databases. Over 1622 studies was identified. After screening 12 studies was included within the review.

Results: Diuretics were found to be safe and effective if dosed appropriately. Loop diuretics at high doses were found to increase renal decline and risk of hospitalisation. However, the mineralocorticoid receptor antagonists and finerenone, when dosed appropriately, were found to preserve renal function, and reduce all-cause mortality and hospitalisation.

Discussion: Diuretics are safe and effective in the management of CRS if managed appropriately with close monitoring. Alternative therapies such as ultrafiltration have not shown to be as effective. Further research needs to be done within the field, especially with diuretics in combination with sodium glucose transporter 2 inhibitors.



Effect of Permittivity Tensor Orientation to BaTiO₃ Impedance Properties

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Abstract

The aim of this research was to identify the effects that the anisotropy of the permittivity of BaTiO₃ has on its impedance behaviour. BaTiO₃ is a dielectric material used to manufacture MLCCs in trillions annually for the electronics industry. This industry sector is expected to grow in the coming years and with it the need to increase the capacitance of the MLCCs.

Reducing the distance between electrodes is a way of increasing the capacitance, but as the separation gets smaller there is increasingly less dielectric material in between and therefore tuning the material properties will be more and more important. There are currently no studies showing how the anisotropy of a material affects its impedance response in these cases.

All the work on BaTiO₃ was done using COMSOL, a FEM package. Due to the need of setting up so many models with different settings each, LiveLink for MATLAB was used to automate creating and running the COMSOL models.

This research has shown that due to the current being confined inside the grain (the grain boundaries act as insulating barriers) the aspect ratio of the grain and the orientation of the permittivity tensor with respect to the direction of the applied voltage creates very different impedance responses of the same material.



The Effect of Teaching Competencies on the Total Development of Children With Special Needs in Ghana.

Betsy Malm

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Abstract

Education is a fundamental right regardless of the type of school a child attends, the teacher should be qualified and willing to teach that child even if they have a learning disability. The Salamanca Act of UNESCO rules on the equalization of persons with disability to form a central part of the education system. Despite Ghana's efforts to improve inclusive education in the country, it is lagging behind. A major reason for this is the competencies of teachers who educate children with special needs. This study seeks to explore the effect teachers' competencies have on the full development of children with special needs.

This study will be exploratory using a qualitative approach. The framework will be the Social Cognitive Theory. This proposes that teachers who receive proper training will confidently teach special needs children appropriately. Stratified sampling will target teachers with special education training and those without special education training in inclusive schools in Accra, Ghana.

Multikids Inclusive Academy & New Horizon School, the only private schools for children with disabilities serving the eastern part of Greater Accra will be purposively selected for this study. Data will be collected through interviews and observations from a sample of ten teachers and the principal from these schools. Stratified sampling will be used to select the teachers. There will be no risk involved to the participants. A thematic analysis will be conducted based on independent variables which are training in special education and dependent variables which are academic development and interpersonal communication.



How Does the Ambiguous Framing of Blasphemy Laws Cause Harm?

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Abstract

Rarely is blasphemy more ambiguous than in law. Through analysing blasphemy laws in three different contexts, it will become apparent how harmful this ambiguity can be. After examining how Piss Christ highlighted ambiguities about the existence of Australian blasphemy law, leading to problematic expectations of prosecution, one will move onto the UK's Racial and Religious Hatred Act. Following on from assessing how this Act indirectly legitimises blasphemy, one will see how conceptual ambiguity within Indonesian blasphemy law silences minority religions to protect Islamic control. Such blasphemy laws can be dangerously mobilised to the detriment of religious minorities, with internal and external ambiguities demonstrating an inherent tendency for these blasphemy laws to fail. For laws designed to 'protect' the divine, this logically carries with it severe repercussions for freedom of speech discourses as well as religious cohesion. Thus, there is no escaping the firm conclusion that the ambiguous framing of blasphemy laws does indeed achieve a severe degree of harm in three different contexts.



SUSTAINABILITY BCUR 4D

BCUR072
Sustainability

Butterfly biodiversity on the University of Warwick campus

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Abstract

Recent research indicates that butterfly populations in the UK are declining, putting the continued existence of several species in jeopardy. Concurrently, butterflies are considered to be excellent indicators of ecosystem health, and as such can be used to assess the impacts of urbanisation on an area. This paper evaluates the butterfly biodiversity on University of Warwick's campus - which exists as an urban development on what was previously an ancient woodland - in order to draw conclusions about the suitability of campus for both butterflies and in a broader ecological context.

Using the Pollard Walk to monitor butterfly presence on campus, I find that grassland and bareground sites with woodland edge and hedgerow have the highest habitat suitability for butterflies within the campus confines, assessed through the measure of mean species richness and mean abundance, and additionally determine that a significantly lower butterfly biodiversity exists on campus compared to the nature reserve Ufton Fields.

These findings are consistent with previous studies on butterfly habitat preferences, and additionally indicate that the state of biodiversity on the University of Warwick campus is sub-optimal, even in its areas of protected woodland. The results are reflective of a national disappearance of butterflies, however, by compiling literature on biodiversity management practices and butterfly preferences, I make informed suggestions as to management methods which Warwick Estates could implement in order to improve on-campus butterfly biodiversity. These suggestions can be applied further afield in urban institutions such as universities looking to enhance their biodiversity.



The Pursuit For Perfection

Grace Marlene Pasaribu

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Abstract

Despite a positive move towards achieving a more inclusive and diverse society there is a notable absence of women of colour within body image research. Furthermore, academic work surrounding representation within media and cultural studies is predominantly concentrated on people of colour. This discrepancy identifies a crucial research gap where both topics need to be integrated seamlessly to find positive solutions, that empower women of colour. In response to this issue, this paper will present findings from divergent research underpinned by Hall and du Gay's 'The Circuit of Culture' theory which simplifies how representation, identity, production, consumption, and regulation interlink, exploring if a lack of representation causes body image dissatisfaction among young women of colour (du Gay et al. 1997). A mixed methods approach is used, through an online survey with 100 respondents to understand the general opinion around body satisfaction and representation among British Gen Z individuals, and a series of interviews with mixed sample groups including women of colour, men of colour, white women, white men, Indonesian individuals, and industry experts. The findings demonstrate the emotive impact that a lack of representation causes women of colour, and the detrimental implications it has on their body satisfaction and overall self-worth, resulting in extreme body dissatisfaction and in some cases prominent eating disorders. This research shows how significant this issue is within society and why there is an important need to find solutions within further research.



Does West Know Best? – Defining Project Requirements for a Learning Management System (LMS) for Qatari Customers

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Abstract

It is acknowledged that ‘projects executed within international organisations will encounter cultural differences’ (Anbari et al, 2004, p.14). Furthermore, these cultural differences have been linked with interference in delivering successful projects (Espinosa, 2006, p.345). The researcher is a degree apprentice within a large UK defence company tasked with running a project to implement a digital Learning Management System (LMS) at a Qatar Technical Institute.

This action research follows Checkland and Scholes (1990) Framework, Methodology and Action (FMA) model. Through the cyclical process the aim is to ‘bring about improvements through making changes in a problematic situation, and ... generate new knowledge and new insights’ (McKay and Marshall, 2001). To attempt to deal with cultural differences and avoid cultural imperialism, the framework of Western versus Non-Western Cultural Values provided by Anbari (2014) will initially be utilised to inform early interactions. Through the FMA process this framework will be built upon and adapted as the project definition stage progresses and cultural issues are dealt with.

Whilst the work could be considered idiographic due to subjective interpretations, it is hoped that the developed framework may reveal patterns that could assist in reducing cultural issues, especially cultural imperialism, affecting future Qatar-based project work. The project and study are currently on-going but already specific aspects of Qatari culture have been identified which appear to conflict with both a generalised perspective on Middle Eastern culture and a western perspective on what the project requirements should be.



Radio Modulation Classification Using Deep Residual Neural Networks

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Abstract

We propose a new deep residual network for Automatic Modulation Classification, OPResNet-18. It achieves state-of-the-art accuracy on the RadioML 2016.10a data set. We train the proposed model and other state-of-the-art networks with augmented data by adding a Carrier Frequency Offset (CFO). We find that the previously proposed IQNet-3 is robust to CFO. We demonstrate that this robustness allows the performance of IQNet-3 to be further improved through data augmentation in contrast to existing neural networks that cannot handle CFO. Finally, we provide evidence that standard data pre-processing techniques for time-domain data that reportedly perform well in many domains do not perform as well as a simple alternative, the outer product, in the IQ domain.



The Effect of HIV Prevalence on Attitudes Towards Homosexuals in Sub-Saharan Africa

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Abstract

Many attribute the progress made in gay rights in the West to the HIV/AIDS epidemic. However, despite the higher prevalence in sub-Saharan Africa, similar progress has not been made. Previous quantitative literature suffers from methodological issues and is limited to the US. I contribute to the literature by using two methods, an instrumental variable approach and a difference-in-differences estimation, to estimate the causal effect of HIV prevalence on attitudes towards homosexuals in sub-Saharan Africa. The former uses the conditionally exogenous effect of the rate of male circumcision on HIV prevalence, while the difference-in-differences exploits a differential impact of HIV prevalence on attitudes across older and younger cohorts. The estimates suggest a 1 p.p. rise in HIV prevalence improves the likelihood of accepting a homosexual neighbour by 0.4-3.3 p.p. I also discuss and evaluate some possible mechanisms through which HIV prevalence could affect attitudes. Despite limitations, the implications of the study warrant further attention in research.



Pace University COVID-19 and Black Lives Matter Movement Oral History Project

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Abstract

This oral history project explores how disease and social unrest are interconnected by studying the COVID-19 pandemic and the Black Lives Matter Movement (BLMM) through crisis-based oral history interviews. The project commenced as a Course-Based Undergraduate Research Experience (CURE) in a new civic engagement public history course HIS196H COVID-19 and Black Lives Matter: Comparative, Crisis-Based History in the American Experience offered first in Fall 2020 and again in Fall 2021, as part of the Antiracism Education (ARE) pilot program at Pace University in NYC. While studying the intersectionality between disease and social justice struggles in the twentieth and twentieth-first centuries, students learned oral history methodology to conduct interviews focusing on Pace and Lower Manhattan. These interviews were structured as personal life narratives to provide interviewee context in generating original testimonies about COVID-19 and the BLMM.

Undergraduate students conducted two-to-four interviews via Zoom, with or without video, in a journalistic style as individual life stories impacted by crises. The interviews generated unfiltered testimony and documented detailed memories about COVID-19, the Black Lives Matter Movement, or both. Each interview was transcribed and analyzed to reveal larger themes and become a primary source in offering new knowledge about watershed events. The project is publicly accessible as a digital humanities website featuring an interview archive with related resources to begin to assess the direct impact of COVID-19 and the Black Lives Matter Movement on the university and surrounding community; the course HIS 196H will be offered again during the 2023-2024 academic year.



Reliability of a Unified Tool (MASTER scale) for Bias Assessment of Primary Research

Yaman Khamis, Elhassan Mahmoud, Ashraf Ahmed, Abdalla Elsayed, Amgad Elshoeibi, Muhammad Zain Kaleem

Qatar University, Doha, Qatar

Abstract

The assessment of the quality of trials is an area of keen interest in methodological research especially for application to evidence synthesis. The need for a highly reliable and valid tool to identify the best quality evidence is a priority. The study aims to assess the inter-rater reliability of the MethodologicAl STandards for Epidemiological Research (MASTER) scale, the first tool for methodological quality assessment (mQA) of multiple analytical study designs in clinical research. Seven raters who have undergone training in clinical epidemiology will independently apply the MASTER tool on eleven studies comparing normal saline with ringers' lactate in acute pancreatitis. Inter-rater reliability for the final count of safeguards assigned to each paper will be calculated via an intra-class correlation coefficient (ICC) derived from a mixed model two-way analysis of variance in which assessment will be the fixed factor and studies will be modelled as random. In addition, each of the seven standards will also be assessed separately for reliability. These 11 studies will include both randomized trials and observational studies since the MASTER tool is a unified assessment tool for analytical studies. Agreement of counts of safeguards within each standard across raters as well as for the whole tool will be reported. Detailed results and conclusions will be updated once the study is completed. If the results confirm the reliability of the MASTER scale, this will be an important finding for researchers wishing to use this unified tool and will help them with decision-making around choice of tool.



Digital Positionality: Designing a Qualitative Map Toward Epistemic Justice from the Bottom-Up

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Abstract

The planetary Information and Communication Technology (ICT) network is a part of our daily life. However, we often struggle to understand it beyond our highly personalised interfaces, resulting in a knowledge gap known as epistemic inequality. Since ICT carries the biases of its powerful creators, it exacerbates inequality by benefiting privileged groups over historically marginalised ones and giving rise to new forms of domination. Thus, it is crucial to enhance digital self-determination from a grassroots level and make netizens' unique positions in the planetary network accessible. Inspired by a Participatory Action Learning and Action Research (PALAR) approach, our transdisciplinary research group promotes epistemic justice for netizens, including ourselves, through a feminist lens. To achieve this aim, we want to design a reflexivity tool that illuminates how the planetary ICT network is interconnected with each netizen's social position and identity. Thus, we explored the needs and ideas of diverse social groups in Berlin through an electronic can phone, workshops, and a group discussion, revealing that conquering entrenched digital behaviour, affect, and emotions, such as shame, is essential for achieving digital self-determination. We devised ten design principles and a definition of digital positionality to guide us through the upcoming months in developing the tool to nurture ICT awareness and guide netizens to shape digital futures responsibly. Moreover, we invite you to participate in our presentation and actively join us in this process. Ultimately, we will launch an open-source tool to transform digital governance, netizens, and the academic research agenda from below.



Microexpressions in Animation

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Abstract

Animating expressions and thus creating complex characters are key factors in creating engaging animations that connect with the audience. Therefore, the research part of the project will focus on the psychology of microexpressions and their usefulness in animation; how they can be used and explored in order to create a long lasting impression on the viewer.

The research will look at the universal emotions, what microexpressions are and how they can influence the visual interaction with the audience. Besides the theoretical part, the aim of the research is to explain how microexpressions can be used in animation and what effects they can achieve.

The goal of the project is to create a proof of concept of a visual library that will display short animation examples of microexpressions. This library will serve as a visual reference for any animator, as it would provide a selection of microexpressions for different emotions, all in one library.

As the final product of my research, I will create an animation piece that would showcase these microexpressions and the ways they can be combined to achieve more complex feelings using animation layers.



From Inspiration to Innovation: An Exploration of the Collaborative Process Between Sportswear Brands and Athletes in Product Development.

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Abstract

Sportswear is a form of functional apparel which serves the purpose to allow athletes to perform their sports to the best of their ability or better, improve the ability of the athlete. The global sportswear market was worth \$379bn in 2022 (Smith, 2022), with sportswear brand Nike leading the industry with a market cap of \$197bn in 2023 (Nasdaq, 2023). The sportswear market is split into various segment, including active people, athletes and those who wear athleisure. However, the role and range of involvement of elite athletes in the sportswear industry is not well understood. As such, the goal of this research is to explore the extent and impact of athlete's involvement in the product development process. The work of Pitimaneeyakul et al. (2004) methodology was adapted for data collection, utilising semi-structured interviews with employees in product management roles of sportswear brands such as Nike, Adidas, and Gymshark. The findings from this study will highlight how active involvement of athletes can increase product efficiency and innovation. Furthermore, this study will demonstrate how sportswear brands can more effectively utilise athletes they sponsor through greater engagement in the product development process, thus influencing the way sportswear brands and athletes interact with each other.



Burden or Benefit – Changing Perceptions of Project Metrics

Emma Crewe

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Abstract

In the field of project management, the use of metrics is seen as a critical factor contributing to project success (Hartman and Ashrafi, 2002). Their usefulness however is limited by an apparent disconnect between stakeholders' needs and the type of metrics which are applied (Shenhar and Dvir, 2007). As a degree apprentice, this researcher is running a project for a large aerospace engineering organisation to improve project dashboard performance and this is the focus of study.

A participatory action research (PAR) approach (McIntyre, 2007) is taken to ensure the process design approach for data gathering and metric displays are iteratively informed with and by the stakeholders and their engagement with the systems. PAR was selected to ensure greater stakeholder buy-in and understanding of the significance of the integrity of the data gathering processes.

Whilst this research is still on-going it is hoped that as well as the project itself being successful, the findings from the study will add to our understanding of stakeholder interaction with metrics. In particular, whether a more participatory approach with data gathering process design can change project workers' perceptions of metrics to improve data integrity and so project dashboard performance more widely.

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The Colonial Origins of Institutions: An empirical investigation of the consequences of Land Inequality.

Juan Destribats

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Abstract

Despite the geographical proximity and the numerous climatic similarities between San Diego (USA) and Tijuana (Mexico), residents of both cities do not enjoy the same living standards. The academic consensus on the matter is that these differences in development are rooted in the two nations' colonial past and how these have affected the development of their institutions. Indeed, literature on how the quality of institutions affects development is extensive. On the contrary, analysis of the roots of this divergence in the quality of institutions is more limited and subject to biases. In that way, this paper explores the colonial origins of cross-country variations in land inequality and will propose these differences in land holdings as the main factors contributing to institutional divergence. Our analysis uniquely utilises the suitability of land to growing certain scale intensive crops as an instrumental variable for land inequality. Consequently, we innovate in the way we deal with endogeneity concerns. Given the importance of land in preindustrial societies and how this last one determines imbalances in economic and political power within colonies, we find that high levels of land inequality in colonial times lead to extractive institutions that persist today. Consequently, by proving that land inequality is a key determinant of institutional quality, we provide insight into long-run economic development and advance a rationale for land redistribution policies in societies with problematic institutions. Indeed, redistributing land could be the stepping stone towards creating inclusive economic institutions in underdeveloped countries.



Case series: 4 patients receiving Pulsed Dye Laser or Intense Pulsed Light-Activated Photodynamic Therapy for Extramammary Paget Disease (EMPD) - a rare intraepithelial skin cancer affecting the axillae and perineum

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Abstract

Introduction:

EMPD has a few treatment options - one of which being Photodynamic Therapy (PDT) - the use of a topical photosensitiser to penetrate abnormal cells, which is then activated with a light source to induce cell death.

Whilst red light is conventionally used, this can be intolerable in EMPD due to heat generation. Different wavelengths of light may avoid this through a shorter heating period, however, given its rarity, these are understudied in their use for PDT-activation in EMPD.

Methods:

We describe our novel experience of treating four patients with biopsy-proven EMPD with Pulsed Dye Laser (PDL) or Intense Pulsed Light (IPL)-activated PDT. Our patients were aged between 73 and 83 years; 3 were female and one male. All four were not suitable for or had failed primary surgical management. Two patients had previously tried topical imiquimod cream with no improvement; One had tried and not tolerated red light-activated PDT.

Findings:

One patient experienced complete remission of her disease with no clinical or histological evidence of recurrence and remains disease-free 18 months after her last treatment. One patient saw improvement in symptoms, and discontinued treatment due to other health factors. Two patients are showing good signs of improvement to-date and are awaiting follow-up.

Conclusion:

We present 4 cases of EMPD where IPL or laser-activated PDT has safely and effectively improved disease severity. This paper adds to the literature on using PDT to treat EMPD, and is the first description of using lasers or IPL to activate PDT for EMPD.



SUSTAINABILITY BCUR 5B

BCUR085
Sustainability

Urban Heat Island Effect- The takeaways from studying the effect of extreme heat in vulnerable communities of NYC

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Abstract

In late 2021, a study by Climate Central ranked New York City the third-hottest out of 159 cities- approximately 7.6 Fahrenheit degrees hotter than neighboring areas. This is known as urban heat island where central cities experience significantly hotter temperatures than surrounding suburban areas. Our research aims to uncover the existing social network between community members, local organizations, and the local government, in regards to how they prevent and respond to extreme heat.

Our focus was on two neighborhoods within Brooklyn and the Bronx. Both had a high population of minorities and residents in poverty. They also scored a 5 on the Heat Vulnerability Index (HVI), indicating the highest risk of heat-related death. Through our research we have found that there is a lack of communication between local organizations and the community leaders. Thus, resulting in the community not being knowledgeable about the resources that are available.

NYC's Department of Health reported approximately 102 heat-related deaths between 2010 and 2019. With city initiatives operating behind schedule, the population is at increased risk in cases of preventable deaths. Uncovering this communication gap allows the community to be better equipped with resources that will protect them from extreme heat.

Future studies will continue to understand the underlying social network to facilitate discussion, conduct in-person outreach, encourage connectivity between communities, and increase urban heat island literacy. Closing the communication gap is an imperative step to ensure that communities are protected from a heat trend that is expected to get worse.



Attitudes of Maritime employees towards long term remote work arrangements in Singapore

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Abstract

Remote work is widely used globally to adjust to the situation with Singapore having 49% of workers working remotely in 2020. (MOM, 2021).

While current research papers cover on issues and gains arising from remote work before and during Covid-19, in the social, health, environment, and technology aspects, along with statistics on Singaporeans' work style in the last 2 years, this study will be looking into the attitudes of maritime employees towards remote working and the feasibility of employing remote work in the future as Singapore move forward progressively to live with Covid-19.

Given how Covid-19 has changed the traditional work method, it is important to examine the perceptions of maritime employees and how these perceptions impact companies' decision making on remote work as a permanent work style .

In particular, the aim of this research is to analyse the feasibility of using remote work as a fixed work method in the industry moving forward.

The end goal of this report is to explore, discuss and provide more understanding of remote work in Singapore's maritime industry and examine the possibility of implementing remote work in the long term for maritime companies, serving as an additional source to help companies make management decisions. In a global context, this may serve as a reference for new management strategies and technologies for maritime business, with Singapore as a case study.



Can Information Provision Support Pro-Environmental Consumer Choice? Evidence from a Randomized Controlled Trial

Maksymilian Łudziński, Mateusz Wiewiórski
University of Warwick, Coventry, United Kingdom

Abstract

Lack of awareness of the environmental consequences of consumption can be key to limiting environmental degradation. Current research documents experiments done to investigate the impact of information provision on non-reusable cup consumption (Keller et al. (2021), Asmare et al. (2021)), but no studies have dealt with a university setting while implementing a randomized identification strategy. We design a stratified randomized controlled trial (RCT) among Economics students at the University of Warwick (N=240) by distributing an online survey. We investigate whether providing information on the consequences of non-reusable cup consumption, the treatment, increases the willingness to buy a reusable coffee cup and increases the likelihood of carrying it to the cafe. We find that there is no statistically significant effect of treatment on either the willingness to switch to the reusable cup or remembering to bring it to the cafe. The results of no effect of treatment are supported by no change in the level of environmental knowledge displayed by the participants before and after being given treatment or placebo (control group). This suggests that the ineffectiveness of treatment could be due to a relatively high level of awareness in both groups. Future research should focus on testing the hypothesis in different settings, where the general level of knowledge about the environment may not be as high - at lower levels of environmental knowledge, information provision could significantly affect the willingness to switch to environmentally-friendly consumption.

**COMMUNITY** BCUR 5CBCUR088
Community

A Romanticized Impact? An Ethnographic Study of Community Football Among Refugee People in Liverpool

Pablo Caycedo

*Liverpool John Moores University, Liverpool, United Kingdom***Abstract**

In 2021, the number of refugees worldwide increased to 89.3 million due to social, economic, and political problems. As of 2022, 17% of immigrants in the UK are asylum seekers and come from countries such as Syria, Sudan, and Iraq. The latter has resulted in a multicultural environment where individuals struggle to adapt. In this context, community sports organizations have appeared as mediators in the integration process through dedicated sports programs. However, the effectiveness of such programs seems to be romanticized by the media and sports organizations themselves, assuming that sport is naturally inclusive, and limited research has examined this topic. Using the contractarian theory of John Rawls as a theoretical framework, the project, conducted at Everton in the Community, uses short-term ethnography (observation) as its primary collection method, complemented by semi-structured interviews with refugees from various countries and staff from the community football organization. The study seeks to understand how refugees have perceived their adaptation process and whether the sport program offered by the community sport organization has helped them to adapt to society and shape their identities. The results will improve understanding of the effectiveness of sports programs in the refugee integration process and their shaping of identities while analyzing the complexities in a multicultural environment. The outcome of this project is pivotal to understanding how the process of integration and migration to European countries works and helps community sport organizations, governments, and international governing bodies to understand the role that sport plays in the current refugee crisis.



The Benefits and Challenges of Music Groups and Choirs for People with Aphasia

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Abstract

BACKGROUND: Aphasia is a language disorder caused by brain damage and is experienced by over 350,000 people in the UK¹. Due to their communication difficulties, people with aphasia face barriers to participating in everyday settings. It is the responsibility of Speech and Language Therapists to understand these barriers and create strategies to avoid them.

There are two local music groups for people with aphasia: a special interest music group (6-8 members) run by The North East Trust for Aphasia charity, and a choir run by Sage Gateshead, called 'Magenta Singers' (10-20 members).

AIMS: This research focuses on the techniques used by the choir and music group leader which helped or hindered the aphasic participants to take part.

METHODS: Information was gathered using four approaches: a literature review into aphasia choir participation; analysing the zoom recordings of the NETA music group's online sessions during the COVID-19 lockdowns; observing the Magenta Singers in-person rehearsals; and collecting qualitative data from an interview with the Magenta Singers choir leader.

CONCLUSIONS: Participation in music and singing groups can have broad and positive impact on a person's wellbeing and personal identity. Most participation barriers could be minimised by adaptations made by the choir leader. Some challenges were unavoidable, such as grief caused by loss of previous abilities and managing the wide range of abilities present among the group members. Online aphasia choirs presented additional participation challenges to those that take place in-person.

¹www.stroke.org.uk/what-is-aphasia



Exploring the Youth's Voter Apathy: To Unravel the Myth of Political Disengagement in Hong Kong

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Abstract

Relative to the 2016 election for the legislature, the Hong Kong youth turnout rate plummeted from 56 percent to less than 7 percent in 2021. Does the low voter turnout mean that the younger generation in Hong Kong is politically apathetic or disengaged in society, as suggested in the conventional political science literature? This study endeavours to dispel such a myth. This study contends that beneath the surface of non-voting, the Hong Kong youth features complex experiences of political engagement and a change of contentious repertoires, which they consider politically safe after the Beijing-led National Security Law (NSL) became effective on 30 June 2020. Empirical data were mainly solicited from 14 informants (aged 21-23) who were recruited for in-depth interviews through Zoom or face-to-face. Based on the findings, it is suggested that the Hong Kong youth should not be deemed politically apathetic; rather, they seem to be heedful of political issues and are willing to be involved in politics despite the increasing political threat they face in the post-NSL era. Implications of these findings are discussed.



DATA BCUR 5D

BCUR091

Data

The paradox of Air Pollution on the Real Estate Market

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Abstract

Air pollution has been linked to worsening population health, including increased cancer rates, heart disease, and respiratory conditions. It is essential to understand whether individuals are willing to pay more to avoid the harmful effects of pollution. This research can help policymakers, real estate investors, and homeowners make informed decisions about regulating emissions, building new developments, and implementing green infrastructure.

Previous studies in the United States have used cross-sectional data to compare home prices at a given point in time across different geographical areas. However, this approach can be biased because it does not account for factors other than pollution that affect home prices. To address this, I used panel data on house prices and air pollution for 800 counties in the United States from 2000 to 2022 to examine the effect of changes in air pollution on changes in home prices.

Data on home prices were obtained from the American Community Survey, while data on air pollution for each county were obtained from the U.S. Environmental Protection Agency.

I accounted for differences between counties that stay the same over time, as well as demographic, socioeconomic, and geographic measures for each county.

My findings show that an increase in pollution is associated with a decline in a county's average home price. Moreover, the relationship is non-linear, with the effect almost disappearing at moderate levels of pollution. This research demonstrates that regulating air quality is not only a cost to society but it also increases household wealth and well-being.



Taxonomic Bias: The Social Media Activity of UK Zoos and Their Followers

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Abstract

Conservation research on social media (SM) uses demographical information, geo-tagging, and timestamping to gauge public interest. Taxonomic bias (TB) is the misrepresentation of taxa compared to their occurrence in nature. TB has affected animal research since the 16th Century, with SM studies finding a mammal bias. However, these studies used only one platform and a short period of posts. Misalignment between research and conservation may cause unnoticed extinctions of threatened species. Zoos inspire public behavioural change as ex-situ conservation hubs. If TB affects zoos, they cannot fulfil conservation and education goals. This study would be the first to gather empirical evidence of TB in SM activity of UK zoos and their followers, across multiple platforms.

Ten diverse UK zoos with 25,000-300,000 mean followers across Facebook and Instagram were selected with number of posts by taxa and post engagement being compared to detect potential TB in SM activity. Data will be collected from 01/01/2018-31/12/2019, predating COVID-19 and allowing engagement, the number of likes per post, to peak. The theme and context of posts will be recorded to determine their effects. Data will be analysed in R-Studio using ANOVAs and regression models. This study aims to quantify TB affecting SM activity of zoos and their followers. As biases have previously been found on individual platforms towards mammals, mammals are hypothesised to constitute more posts and receive higher engagement than other taxa. The identification of potential TB in SM activity may help zoos increase their inclusivity of all taxa to benefit their conservation.



How does the economic impact of the shadow economy differ between developing and developed countries?

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Abstract

Extensive literature provides contrasting conclusions regarding the relationship between the complex phenomenon of the shadow economy and economic growth. The shadow economy is defined as ‘all economic activities that contribute to the officially calculated (or observed) gross national product but are currently unregistered’. The first hypothesis this work investigated is that developed countries have a higher quality of institutions compared to developing countries, resulting in a smaller shadow economy. It is thought that institutional quality is the most important factor influencing economic growth, determining how secure property rights are, therefore, an increased institutional environment encourages innovation, potentially influencing the size of the shadow economy. Furthermore, the second hypothesis investigated is that an increase in a country’s total productivity factor has a greater impact on GDP per capita in developing countries compared to developed countries.

This work examines the validity of these hypotheses using data from 2010 to create a large cross-sectional data set and to derive economic equations to be tested using an econometric system. These determine whether the shadow economy has a greater impact on developed or developing economies, including whether the impact is positive or negative. The shadow economy, economic growth and institutional quality have not been combined before; therefore, the results will enhance the extensive research that has been completed on the shadow economy. Future research could consider other factors such as political stability or exchange rate volatility rather than institutional quality which could also have a significant impact on the shadow economy and economic growth.



Robots or Humans, who do you prefer?

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Abstract

With the rapid increase in artificial intelligence capabilities underway, Holzer (2019) suggests people's day-to-day jobs could be replaced by a machine. With many automation tools supplementing human labour will this become beneficial, detrimental, or ultimately eliminate the need for the personnel.

To answer this controversial question, this study investigates automation tools replacing current manual processes to indicate how people at work are being impacted. By taking a deep dive into the effected personnel's on how their feelings, behaviours, and work ethics have differentiated from before and after the tools have been implemented will help determine its outcome.

The data was collected through two questionnaires given to participants before and after using an automation tool to aid their current manual process at work. This exhibited an elucidated contrast into participants feelings and work rates. From 80 percent of members claiming the automation tool now takes them 5 minutes to complete their task, from what used to take 1 hour. Subsequently, participants revealed after the tool was implemented, they were more motivated to complete their tasks, ultimately increasing their work ethics.

Although the future is exciting, this study only explores a small portion of what the effect of automation is on us, leaving us still uncertain of what is to come.



Historiography and Narrativity: The LKY Musical Read as National Biography

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Abstract

This paper interrogates the confluence of History and Literature, at which the conception of a national biography emerges in *The LKY Musical*. It begins with a comparative survey of the trajectories, from pre- to post-modernity, of the scope of historical scholarship, truth and factuality in biographical theory, as well as Carlylean “great man” historiography in order to arrive at a parameterisation of “national biography” as a historico-literary concept. What it means for a biography to operate, not in pen-and-paper format, but as theatre will be studied in the second section of this paper, which examines the praxis of theatrical presentation in *The LKY Musical*—its leveraging of stage configurations and their varied affordances, kinaesthetic and affective resonance, and motifs to craft its narrative. For theatre is a “collaborative venture...which cannot exist without the actor who performs and the playgoer who responds” (Marsden 2017)—and, indeed, the playgoer who remembers and who, thus, sustains its reality—the musical’s management of actor-audience dynamic, audience expectations, audience competence, and audience response will also be considered. Upon dealing with such questions as “to whom is the musical addressed?”, “should the musical be read as national biography?”, and “can the musical be read as such?”, this paper will conclude by discussing the narrative dynamics of *The LKY Musical*—of the ways in which the story of one man, Singapore’s founding prime minister, the late Mr Lee Kuan Yew, figures, in actual fact, as the story of communities-that-had-been and communities-to-be.



Creating a Novel Tool for Predicting Space Weather

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Abstract

Every night, at the end of any news programme, there is a weather forecast. The forecasts are trustworthy and accurate, and combining the predictions from each region, we have a complete knowledge of our entire planet's weather. Now what if we could have that, not for any country here on Earth, but for the Sun! My research is part of a bigger idea; to prognose the Sun's activity for our benefit. Our star has a diverse and interchanging magnetic field. Active Regions, Sunspots and Coronal Holes are magnetic entities that interact and affect each other. Results of these interactions are Solar Flares; common and intense events of plasma ejection. Crossing paths with them means the end of all our satellites. As you can imagine, analysing this multivariable activity is essential but hectic. That is why my research focused on simulating that structure with a simpler format, like slab which is nice to work with mathematically. Of course, I first had to get acquainted with this new field of Solar physics. After numerous weeks of studying through related books, papers and articles, I was finally able to derive the dispersion relation for propagation of Magnetohydrodynamic waves in a magnetic slab with inhomogeneous regions outside and with the wavenumber along the slab being non-zero. This is already an extension of our pre-existed knowledge. With slowly adjusting the complexity of the structure we can eventually simulate the full picture, and have complete model of our star, the Sun!



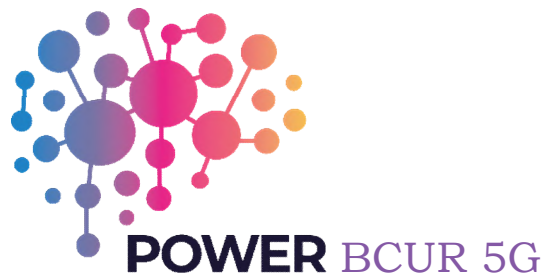
Investigating the interplay between novel lncRNA translation and decay

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Abstract

Long noncoding RNAs (lncRNAs) are a heterogeneous class of transcripts, over 200 nucleotides in length, involved in an array of regulatory biological processes. Their aberrant expression is associated with the development of various diseases, notably several cancers and neurological disorders. Whilst their regulatory roles are well established, there is increasing evidence to suggest that lncRNAs can undergo active translation to produce biologically active peptides. Their importance in the regulation of gene expression, potential to produce biologically active peptides and involvement in disease progression means that it is crucial that we understand how these transcripts are regulated so that we can begin to understand how lncRNA-associated diseases develop. A fundamental mechanism of RNA regulation is RNA decay. RNA decay is regulated by a class of enzymes known as exoribonucleases. This project investigated the regulation of several lncRNAs and aimed to answer the questions: Do any of the selected lncRNA transcripts show specific sensitivity toward 5'-3' degradation by the exoribonuclease Pacman/XRN1 and is their association with translational machinery important in sensitising them toward this decay? Working within the model organism *Drosophila melanogaster*, we used SYBR qPCR to show that several lncRNAs show a significant change in expression levels after Pacman knockout, and several show a change in their decay rates. These findings begin to unlock the molecular mechanisms by which lncRNAs are regulated and are the first step in deepening our understanding of lncRNA regulation. Moving forward we aim to characterise the functions of these lncRNAs and their peptides in vivo.



The Roles of Age, Military Occupation and Conspiracy Endorsement in Recognising Disinformation on the Russian-Ukrainian War

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Abstract

In the midst of a war, information sharing in the world has become increasingly volatile. Social media hosts over 4.7 billion users, where it has become the new weapon to control the global perception of critical international affairs. With the recent tensions and conflict accumulating between Russia and Ukraine, there has been an overwhelming production of disinformation spread about both parties. As social media has little regulation and is easily accessible, people around the world can fall victim to fraudulent and fake narratives online. Several studies have now revealed that adults aged 60+ are more likely to incorrectly identify disinformation online than those aged 18-29 (Pehlivanoglu et al., 2022).

Additionally, in times of crisis, Conspiracy Theories (CT) tend to soar due to the loss of control and anxiety surrounding an issue. Hence, with the current conflict, an increase of CTs is circulating about the Russian-Ukrainian war (Thompson, 2022). Previous research established that an individual's tendency to believe CTs was an underlying mechanism for accepting and correctly identifying false claims (Jolley and Douglas, 2014).

As disinformation relating to the Russian-Ukrainian war continues, psychological research is limited in this area requiring further study. Therefore, the aim of this study is to understand the roles of age and conspiracy beliefs on online disinformation regarding the Russia and Ukraine war. Furthermore, as little is known about whether military personnel are better at identifying disinformation than civilians, individuals from both samples will be recruited and their responses will be compared.



“The One Place Where I Don’t Feel Frustrated”: An Interpretative Phenomenological Analysis of Art Students’ Experiences and Emotional Responses to the Flow State.

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Abstract

We all know the feeling of becoming fully immersed in an activity to the extent that we lose awareness and track of time. Csikszentmihalyi describes this experience of full immersion as the state of flow. Previous research on this topic has suggested that flow can lead to a happier more fulfilling life. We were interested in studying this because it lays at the heart of human creative activity and needs further psychological exploration. Therefore, we asked artists to discuss their experiences of flow and art using a technique called Interpretative Phenomenological Analysis. Semi-structured interviews were conducted to gain an enriched understanding of flow in six Newcastle University, Fine Art students. The analysis found all participants experienced flow whilst making art, and this experience was incredibly similar for all students, thus validating the theory. Interestingly, no emotions were experienced whilst the participants were in the flow state, yet positive emotions were associated with the experience of flow. Furthermore, the participants described negative emotions of frustration and dissatisfaction towards having to make art, suggesting that flow could be an incentive for wanting to produce art. These findings point to the importance of flow for experiencing happiness, and, unlike previous research, suggests that flow states can play a role in the motivation to make art. Understanding flow has applications for how we can increase motivation and focus, as well as reduce stress. By manipulating cognitive states to make the flow state more accessible treatments for mental illnesses such as ADHD could be developed.



Post Occupational Analysis of Urban Landscapes: Case Study of Grey to Green - Sheffield, UK

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Abstract

Whilst reflective practice within other disciplines is a well adopted concept, in the field of Landscape Architecture it is rarely noted within the academic literature or in practice. Through the review of design work years later, as landscape designers, we have an opportunity to learn from the observation of behavioural interactions within public or private space as a form of reflective practice.

Grey to Green, located in Sheffield, is a pioneering design, incorporating flood risk management with the intention of increasing public interactions and uses of outdoor spaces having been designed with the public in mind. With partial scheme construction having taken place, it is possible to directly compare past and future design intentions with current public perception and usage, facilitating possible adaptation of future design schemes.

This research explores not only current uses of the Grey to Green scheme, but also how overall human interaction with nature has changed over time. Through the use of a range of techniques including questionnaires and observational analysis, comparisons were drawn with previous data sets. Results of data analysis can be applied to future stages of design work of this scheme. Changes in public usability of the area were identified, and through comparison of project aims in 2014, consideration of future changes to design intentions were suggested.

Reflective practice of this nature has potential as a fundamental review tool for the development of landscape architecture practitioners, and has potential to be applied to future schemes beyond Grey to Green.



HEALTH BCUR 6A

BCUR101
Health

What Do Online Forums Tell Us About Patient Experiences of Specialist Weight Management Programmes for People with Severe Obesity?

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Abstract

Background: 5 million people in the UK will have severe obesity (Body Mass Index > 40kgm⁻²) by 2035, twice 2015's prevalence. The NHS offers specialist weight management programmes (SWMPs) to support patients. However, obesity is a complex condition, with some patients seeking additional support from similar others on online forums.

Aims: There is currently a paucity of evidence for effective SWMPs and an urgent need to understand patient perspectives. Online forums anonymity generates candid views of SWMPs. Using forum content to address the gap in our knowledge, this research explored patient experiences of SWMPs.

Methods: Using web search engine Google with keywords and web address identifiers, public forums used by people with severe obesity were sourced. Within these forums, snowball sampling and search strings identified threads relevant to SWMPs (n=57). Thematic analysis was used to inductively code and identify patterns highlighted by forum users.

Results: Findings show (i) perceived inadequate communication between healthcare staff and SWMP starters; (ii) online forums enable support and clarity about local SWMPs; (iii) common barriers to accessing SWMPs include perceived weight stigma. This study contributes a new understanding of how people wish to be supported and may help optimise SWMPs.

Conclusions: These forums captured unprompted views of SWMPs as patients themselves identify strengths and problems. Forum users found barriers to information about SWMP content and access. The forums helped address this lack of information and support during the long wait times. Stigma-free consultations acknowledging patients weight management history, and accumulated knowledge, helped reduce reported anxiety.



Gen Z's Routines and Rituals: An Exploration of Health and Habits

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Abstract

The quest for health and wellness has become a high priority for consumers in recent years and comes not without challenges. The younger generation have ever evolving and complex needs, and are turning to online spaces to inspire their self-care routines and rituals, to optimise health and face modern societal challenges such as burnout. The power of ritual has come to fruition in the health and wellness space, although it's a long way from its religious and spiritual roots that age far beyond the trend of self-care, the quest is driven by a similar need for faith, belonging and empowerment. This paper unpicks the desires and motivations driving this trend and explores the practicality of Gen-Z's routines and rituals, and the challenges of navigating this in the digital age. Rituals and habits have been deciphered through the lens of theoretical frameworks that explore needs, values and motivations, combined with a mixed methods approach to research that includes conversations with consumers, industry experts, a survey and digital ethnography, that have been cross analysed with literature. The paper finds adaptations of faith and religion that have been adopted by consumers to build routines that mitigate modern societal pressures, including key insights on how this generation will curate their working lives to work for them, and revelations on the exclusionary nature of health and wellness. Whilst critiquing the way self-care manifests today, this paper offers practical insight into how Gen-Z will overcome the complexities of their own needs.



The Effect of Income on Mental Health: Looking closely at the Global Financial Crisis of 2008 and Lower Income Individuals.

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Abstract

Before the pandemic, one in every ten adults had some depressive symptoms. Unfortunately, this had changed to one in every five adults by early 2021 (ONS, 2021). The COVID recession has hit people extremely hard and this paper is researching the ways a recession and its link to income can affect one's mental health level. This research paper will be looking at the Global Financial Crisis and try to find the mechanisms driving the relationship between income and mental health for lower-income households. This pushes existing literature as many papers neglect lower-income households, even though they are least likely to get help for mental health.

The data set is the British Household Panel Survey data and after 2009 'Understanding Society' looking over the financial crisis in 2008 and the years around the financial crash. I will be running regressions via OLS using unit fixed effect to try and see the magnitude of this relationship alone. The fixed effects will help identify a causal relationship between income and mental health. It is anticipated that lower-income households' mental health will put a larger weight on income however how is also a major issue. This paper will try and tackle these issues as well.

This paper will have clear policy implications, especially finding the largest mechanisms which drive this relationship. Once the relationships and mechanisms are seen, policy can be directed in this way and get to the route of the issue at hand.



Investigating the Role of a P2-like Prophage in Bacterial Immunity.

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Abstract

Phage are viruses that infect bacteria and are the most abundant organisms on the planet. Phage represent a large potential reservoir of potential technologies, from antibacterial treatment to gene therapy and vaccine development. Integrated lysogenic phage genomes are known as prophage and can exist in a bacterial genome for many generations, sometimes conferring protection to the bacterial cell against other phage. Since phage represent a potential avenue for treatment of antibiotic resistant bacterial infections, it is important to understand bacteria-phage relationships and bacterial resistance mechanisms against phage.

A P2-like prophage has been identified in *E. coli* B strain RE1606. Initial genome sequencing analysis of strains resistant to phage T4 exhibited modifications in this prophage, suggesting a role in a phage resistance mechanisms. These modifications were observed in the overlapping region of two uncharacterised genes, ECB0192 and ECB0193. This region contains six “CAGC” repeats in the wild-type bacteria, but up to 30 repeats in T4 resistant mutants. Through production of a series of knockout and knock-in mutants of different *E. coli* strains with the uncharacterised genes, I will seek to understand the role these genes may play in phage-resistance mechanisms.

This project will characterise the genes of this P2-like prophage implicated in bacterial resistance to phage. The findings will contribute to the database of knowledge of bacterial immunity and bacteria-phage relationships, for development of phage technology for antimicrobial therapies.



The World Doesn't Revolve Around You - But Your Libra Moon Does

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Abstract

The continuous societal conquest of happiness has highlighted contemporary wellness as a vital factor in the success of self-fulfilment. The impact of this has seen a shift towards the prioritisation of individual self-betterment and commercial offerings that claim to be a panacea for optimum wellbeing. Additionally, the focus on self-prioritisation has disregarded previous concern for community-based welfare; however, human instinct is not exclusively self-centred, and this has the potential to increase chances of health problems.

In response, this research investigated why Generation Z university students participate in wellness practices, and whether this increases obsessive self-betterment. This consumer group was selected due to their potential to lack social, financial, and emotional stability, which suggests that their deficiency needs are not met. This has been evaluated through the understanding of their personal insecurities, and whether the prospect of physical self-improvement is a central motivator in the inclination to practice wellness. A mixed method approach of quantitative and qualitative research has been triangulated with literature to form insightful conclusions, recommendations, and theoretical frameworks. The combination of pressure and comparison can trigger a desire to maintain an aspirational self-image. Additionally, it has been established that self-improvement is a huge motivator for students, but in reality, the feeling of improvement has been evidenced to be more important than physical benefits. The paper concludes that the cycle of comparison and insecurity enables a self-centred approach to wellness that creates an obsessive urgency for self-actualisation that is counterproductive. Therefore, further research could establish beneficial approaches to wellness.



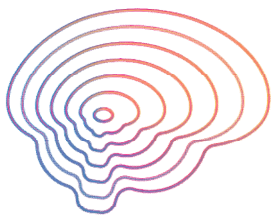
Digital dopamine

Mayowa Osundina

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Abstract

Clothes act as a visual metaphor for our identity, they serve as an introduction to those we have yet to meet. In the physical world, clothes can evoke certain feelings for the wearer, predominantly positive ones. This occurrence is known as Dopamine dressing. Having been on the rise following Covid-19, individuals are now dressing in a way that provokes positive emotions, catering to their own ideals instead of others. This mindset has also begun to spread online. The Metaverse is a decentralised system in which people can virtually meet, create, and share. As of now, virtual worlds and games act as our beta edition of the Metaverse. Individuals have begun to take greater care of their online presence, creating virtual personas to represent their ideal self. And what better way to accomplish this than by wearing virtual clothes. Is it possible for Dopamine dressing to occur virtually as well as physically? This project will investigate how Digital dopamine is taking shape within the Metaverse using virtual fashion, exploring the similarities and differences this trend has in its online and offline settings. Drawing extensive information from credible literature along with primary findings in the form of online questionnaires, industry experts and consumer interviews joined with a handful of Qualitative studies has aided in the exploration of Digital dopamine. There is strong evidence to suggest that Digital dopamine is already taking shape within the virtual world. With consumers using it to fill the temporary dopamine void.



SUSTAINABILITY BCUR 6C

BCUR107
Sustainability

Exploring fungal-specific aspects of ribosome production; finding new ways to protect global food security and human health

Ellie Hansen

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Abstract

My project investigated how ribosomes are produced in fungal cells, particularly to try and identify fungal-specific aspects of ribosome production. Functional ribosomes are essential, as the ribosomes produce all the proteins needed for the cell to survive. Drugs that interfere with the ribosome production machinery can be used in order to kill cells. Therefore, investigating this process in fungal cells could provide insights into new targets for antifungal drugs.

Within my project I investigated the enzyme RNase MRP (Ribonuclease for mitochondrial RNA processing), which is essential for ribosomal RNA maturation; a key part of ribosome production. RNase MRP is particularly interesting as it is known to have fungal-specific subunits, so it could be a good target for antifungal drugs. Through uncovering the mechanism by which RNase MRP acts, we can build the foundation of understanding that is needed so we can target this enzyme with drugs in future.

My project aimed to address the UN Sustainable development goals (UNSDGs) 2 and 3. Fungal contamination is a significant contributor to food spoilage globally. Antifungal drugs that specifically target fungal cells could reduce spoilage, without impacting the food itself. This addresses UNSDG 2, as it aims to prevent food wastage. Pathogenic fungi present a globally significant issue, as per year over 150 million people contract severe fungal infections worldwide, resulting in approximately 1.7 million deaths. Finding new drug targets to address this issue is critical and addresses UNSDG 3.



How do ESG reporting mandates affect the green bond premium?

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Abstract

The green bond premium, or greenium, is the premium investors are willing to pay for bonds with proceeds supposedly going to sustainable projects. Much of the existing literature focuses on measuring the exact premium with different datasets and methods, but scarcely measures policies that could shift this premium; for instance, an ESG (environmental social governance) reporting requirement could give sustainable investors information about the true greenness of the bond, hence increasing the demand for the bond and therefore the greenium. As a part of my dissertation, I use global bond data of from 2008-2022, and create synthetic counterfactuals, a computed dataset consisting of bond characteristics of the green bonds if they were not labelled green. After adjusting for differences in liquidity using a fixed effect regression, the results give the greenium for each synthetic bond pair. To get causal effects of ESG mandates, I use countries that have enforced an ESG reporting mandate in specific years, and compare the greenium of the bond issuers before and after the enforcement of the ESG mandate. If a significant effect is found, then an ESG mandate would make sustainable projects of the country easier to finance, as the investors are willing to pay more; giving countries an incentive to enforce mandatory sustainability disclosures of companies. Further research could measure the effects of other policies, such as sustainable development report mandates. More research in the future could build on this when more policies are introduced, as well as effects of information



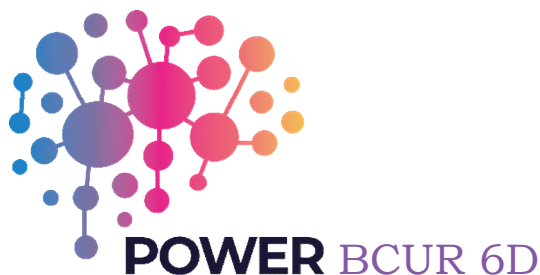
Go-Along Study Tour: Comparison of Active Travel between Leicester and Preston within the U.K.

Kennedy Tellis

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Abstract

The pandemic, together with wider concerns about climate change, and government policies have led to increased cycling uptake in the U.K. In line with this national shift, Lancashire County Council (LCC) has adopted a proactive approach to promoting active travel due to the known benefits on health and wellbeing, increased productivity, reduced carbon emissions and the development of social connections. In a recent survey, the city Leicester was named the 7th safest city for cycling, while Preston in Lancashire was deemed the 6th worst city to cycle in, within the UK, even after investment in cycling and walking initiatives. This paper proposes a study tour to Leicester that would seek to identify best practices and key learning that could bolster cycling in Preston. Participants were invited to explore Leicester through walking and cycling tours, and to consider what could be applied to Preston in the form of interventions and infrastructural change. The study design incorporated an ethnographic research methodology titled, 'Go-Along' that involves participant observation and interviewing, within a defined natural setting and questionnaires. This method allows researchers to observe participant behaviour in situ, while also gauging their perceptions and experiences. Preliminary findings indicate that Preston lacks safer, innovative cycling infrastructure, and there exists no wider ambitious vision, that influences travel and transportation planning, which in turn diminish cyclist safety and active travel in Preston. This data would be fed back to the LCC and could help inform future cycling interventions in Preston in collaboration with local communities and relevant organisations.



Hydroponics and Aquaponics: A look into the future of alternative farming methods in the United Kingdom

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Abstract

The global population is under increasing pressure from population increase, climate change and land use changes. This is threatening global food security, and driving the need to find innovative ways of producing more food through less resource intensive methods. Hydroponics (soilless farming) and aquaponics (soilless farming with aquaculture) are alternative crop production methods that require less water, less space, do not need added herbicides or pesticides and have multiple higher yields per annum compared to traditional field farming methods. These methods, therefore, offer a promising means of meeting the rising food demands of the global population in a sustainable way.

This study examines public and commercial opinions on these alternative farming methods to understand how these methods could be successfully integrated into urban areas. There is already a good level of understanding in the public over the benefits of alternative sustainable farming methods. Additionally, there is a growing desire to shop for more sustainable foodstuffs, perpetuated by the influence of social media.

A designated logo would be well received by consumers and offers the opportunity to increase public awareness and education around sustainable crop production. However, the commercial sector believes a logo would not help promote their products and will introduce another set of regulations/standards their crops would have to meet. It is recommended further research is undertaken to understand the effects consumer opinions would have on the success of these industries on a global scale.



Is The Best Interests Test for Life - Prolonging Treatment Causing Significant Harm to My Child who Lacks Capacity?

Disha Karani

University of Warwick, Coventry, United Kingdom

Abstract

The cases of Charlie Gard (2017) and Alfie Evans (2018) raised ethical questions about state intervention on parental autonomy regarding life prolonging treatment for children lacking capacity. Despite acknowledging that parents are the best judges of the child's welfare, courts continue to override parents' decisions, as the child's welfare is the court's paramount consideration.

But, giving parents more autonomy is becoming increasingly important. Firstly, parental responsibilities exist for the child's benefit, not for the parents'. Children benefit from their parents' decision-making as they share an intimate relationship. Secondly, the law lacks the capacity to supervise complex interpersonal parent - child relations, thus, should provide parents with an uninterrupted opportunity to meet their child's needs. Thirdly, it is problematic when courts impose their preferences on parents in a liberal democracy committed to respecting pluralism.

Thus, firstly, I argue that the best interests tests needs to be replaced by the significant harm threshold, as the former is problematic. Secondly, I argue that Douglas Diekema's test isn't suitable for cases involving life prolonging treatment for children who lack capacity as they raise different ethical questions that Diekema's test fails to answer. Thirdly, keeping significant tests established by MacDonald J in Razeqeb (2019) and Holman J (2006), I propose a new threefold test that should apply only for life prolonging treatment for children lacking capacity. The test aims to give parents more autonomy while ensuring that the child's welfare is the paramount consideration.



The United Kingdom's Evolving Drug Market and the Supply of Illicit Dugs via County Lines Drug Distribution Networks: Do the Public Understand County Lines?

Kate Stratford

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Abstract

“The illegal drug market has long existed but has never caused greater harm to society than now” (Black, 2020, p. 7). Nonetheless, developments in the UK drug market is an area which is significantly under researched. This research is concerned with analysing the extent to which the general public understands this phenomenon. Research so far suggests that solutions in combating exploitation include improving public knowledge around the illicit drugs market.

The objectives of the research are to evaluate the literature base in the area of county lines, develop a questionnaire, determine understandings, critically access findings and to discuss those findings. Content analysis will be applied to gain meaning through the results in a systematic and reliable way. The anticipated results of the research is that there are limitations to the public’s knowledge of the phenomenon that requires clarification.

An improved understanding of County Lines is argued to support the objective of combating the illicit drug market. Thus, if the research can identify the limitations to the public’s knowledge of the area and then clarify any misunderstandings, it may support a reduction to the level of harm caused by this phenomenon.

Future research into the origins of the public understanding of County Lines. Scapegoating is present when it comes to understanding where to direct the blame for the harm caused by County Lines. In order for realistic solutions, the apparent scapegoating needs to be eradicated.



a thing of... Beauty

An inquiry on the role played by the aesthetics within fashion.

Derek Miller Hurtado
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Abstract

For many years, the shift towards widespread consumerist behaviour amongst luxury shoppers has become prevalent in the fashion industry. Today's consumers have seemingly discarded any interest for the appraisal of aesthetic value within fashion, favouring the perpetual consumption of frivolous brand narratives to boost their self-worth both to themselves and others. Whilst disregarding the exponential growth of controversial instances negatively permeating the fashion industry such as environmental damage, racism, homophobia, and even sexual misconduct. This project delves into the inner workings of consumers' decision-making processes, unpacking their thoughts as they contemplate engaging with a fashion brand. It explores the most consumer-valued brand traits to assess not only the role aesthetic narratives play in attracting consumers, but also the extent to which beauty influences the development of consumer-brand connections. By utilising a triangulation method combined with a mixed method research approach, the project analyses numerous individuals and experts' thoughts to reach a thorough synthesis representative of the luxury fashion industry and its consumers. The project examines arguments from over 100 participants provided through questionnaires and in-depth consumer and expert interviews. Consequently, the findings have evidenced the multitude of perceptions regarding the power of a strong aesthetic narrative for a fashion brand and the reasoning behind consumers' apparent indifference towards the fashion industry's many shortcomings. Although it has initiated a conversation around the power of a strong aesthetic, this research project highlights the various ways in which consumer behaviour must pivot for the better.



How do contemporary horror films impact the perception of woman, specifically as mother, in the 21st century?

Jessica Anderson-Dowling

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Abstract

The influx of horror in mainstream contemporary film (including *Hereditary* and *mother!*) has led to varying portrayals of mother figures. Kristeva's 'abjection', simply put, is rejection of the mother by the child and the primal repulsion of disgusting things produced by the body. I will use this to explore how placing the mother in horror situations exacerbates negative feelings towards her, thus fostering further resentment of women. Perception of women in horror is already damaging, typically portrayed as fragile and dependent, whilst the mother can simultaneously be held so rigidly responsible for her children, she almost has no autonomy. The mother, and women more in general, typically tend to be scapegoated, sacrificed, or abandoned. Critics suggest Kristeva's abjection further alienates the mother. However, I will suggest it provides us with a foundation to reconcile with her through a psychoanalytic framework. Bataille's 'continuous being' (doing things which push the limit of a person's sense of being, with reference to disgust) calls for reconciliation of being where embrace of others is necessary to reach harmony. Kristeva and Bataille, applied to the mother, provide new light on the power of embedding women in horror and confront our rejection of women in the first instance. I will tentatively conclude this offers potential to move from abjection in a way to redeem the mother. This presentation aims to show how women in horror can be powerful feminist tools in humanising the mother, and critiquing burdens placed on women as potential mothers.



Influencing change: The power of student-professional co-creation.

Sonya Karamzalieva

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Abstract

The growing student population causes difficulty for universities to provide high standard of curricula and support (Bovill, 2020). It is necessary to build a more fitting learning environment where universities can carry out their functions more effectively. With this intention, using Bovill's (2020) approach to co-creation, the current research used ten staff and twenty-one students across different disciplines collaborating to share their diverse university experience. In brief, uncovering issues regarding the curricula and catalysing the development of task designs such as, learning/lesson structures, personal tutoring, assessment feedback. Researching those issues required gathering and analysing data from the rest of the student cohort using questionnaires and surveys. For personal tutoring it was found many students did not understand the use of this system, meaning there was no clear guidance and engagement from the university for personal tutors and tutees. Following this, action was taken to train personal tutors to effectively assist students on their degree alongside developing a new version of a personal tutoring handbook that was made more accessible to students. All in all, co-creating develops empowerment for students where transparency, shared authority, trust and openness to diverse perceptions is exercised. The process of research expertise and devising solutions cooperatively can be applied by other organisational settings for its improvement and affect student satisfaction from every degree. This project has the potential to widen cross-institutionally, collaborating to transform the higher educational system as a whole.



The Problem of Child Sexual Abuse and the Extent of Public Awareness in Bristol, 1880-1914

Isobel Keene

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Abstract

Child Sexual Abuse is a sensitive topic which has often been overlooked within the historiography of crime because of it being so solidly embedded in the “dark figure” of unreported or unknown criminality. My research focuses on the extent of CSA in Bristol and the degree of public awareness. Although an uncomfortable topic, I chose it as uncovering the history of it offers a wider understanding of its prevention as well as its prevalence today. Although a small historiography, my work fits in with other academic research, such as Louise Jackson and Ailise Bulfin, who both research CSA within Victorian England. I chose Bristol for its lack of research which can address previously unanswered questions, and at the time it was an industrial, portside hub plagued with poverty and vice. To collect the qualitative and quantitative data I used newspaper reports and patient records from the Bristol Maternity Hospital which fills a gap in the historiography. They revealed the extent and the link between class, gender, and societal beliefs regarding CSA amongst girls. Additionally, finding that the public were aware of the perceived threat of strangers but not the legitimate threat from persons from whom the victims were familiar, revealing that the concept of “stranger danger” isn’t a new phenomenon but one of historic origins. The research gives a voice to the silence children that were subjected to this abuse, and I hope it will inspire others in uncovering the history of forgotten children and help prevent CSA today.



The Impact of Heart Rate Fragmentation on High Frequency Heart Rate Variability in predicting health outcomes among elderly

Tin Hang Ng

City University of Hong Kong, Hong Kong

Abstract

Background: The high-frequency (HF) component activity of heart rate variability (HRV) is associated with Respiratory Sinus Arrhythmia (RSA), a marker for cardiac vagal regulation. It is related to autonomic system dysfunction. However, researchers have found lower prognostic value in HF on Health outcomes compared to other non-vagally mediated HRV among the elderly. Researchers have identified Heart rate fragmentation (HRF); the instability originating from the sinus node might confound the HF component, explaining the paradox. **Procedure:** About N = 20 Elderly age 60+ are invited to the lab, undergo three 5-min resting state HRV recordings, and complete self-reported questionnaires (e.g., demographics and Beck Depression Inventory), cognitive battery (e.g., MMSE, MoCA, ADAS-Cog) and executive functioning tasks (e.g., cognitive flexibility; WCST, cognitive inhibition; Stroop, memory updating; N-back).

Aim: Our cross-sectional study utilizes 15 minutes of short-term recording to investigate the impact of HRF on the link between HF and health outcomes (e.g., Depression, cognition). We hypothesize that HRF can partly explain the non-significant finding between HF and Depression and the non-significance finding between HF and cognitive battery. **Significance:** Our study attempts to control for a frequently ignored, possibly confounding factor of HF among the older population. To get a fuller picture, we also investigate HF and its association with emotions and cognition together, where researchers usually investigate only emotional or cognitive outcomes. To sum up, our study could inform the use of HRF on nonclinical elderly populations under short-term (~15 minutes) HRV recording.



The Lived Experience of Food Insecurity Among Adults With Obesity: A Quantitative and Qualitative Systematic Review

Rebecca Briggs¹, Hope Rowden¹, Lukasz Lagojda², Harpal Randeva², Timothy Robbins²

¹University of Warwick, Coventry, United Kingdom. ²University Hospital Coventry and Warwickshire, Coventry, United Kingdom

Abstract

Background: In the current context of the rising cost of living, food insecurity and obesity are increasing both globally and, in the UK.

Aim: This review aimed to fill a research gap by systematically assessing the lived experiences of people with obesity who are food insecure.

Methods: A mixed methods systematic review was conducted in line with PRISMA guidelines. 25 studies were eligible for inclusion; 14 quantitative and 13 qualitative studies (two mixed methods in both analyses). Attention was given throughout to the potential driving factors for the relationship between food insecurity and obesity.

Results: Results of both the narrative and thematic syntheses support each other, and 6 themes were identified: The financial cost of food; Psychological aspects related to food insecurity; Geographical access and the food environment; Food practices in the home; Experience of food assistance; and Parental-child relationships. The cost of healthy food and psychological factors were identified as key driving factors of the relationship between food insecurity and obesity. Psychological factors such as depression, low self-esteem and stress played an important part in the lived experience of people with obesity and food insecurity.

Conclusion: As a social determinant of health, the food environment provides the context in which food decisions are made, therefore systems change is necessary to ensure families can afford the food that enables a healthy diet. For clinicians, identification and attention to the impact of food insecurity on people with obesity is important.



HEALTH BCUR 6G

BCUR119
Health

Water-based Quantum Dots Neutrino Detector

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Abstract

Liquid scintillators are organic compounds in organic solvent. As one of several types of scintillators, they are used as particle detection devices since they are materials that produce photons (light) when a charged particle passes through them. However, usage of such material is often restricted due to fire safety and environmental reasons and cannot be used near fission reactors. Because of this, research and development of water-based liquid scintillators are popular but not yet commercially available. Here, we investigate an alternative, water-based quantum dot (WbQD) liquid scintillation detector. Known and controllable optical properties as well as established protocol to synthesize quantum dots water solution make it an attractive option for nuclear and particle physics application. We characterize optical properties of WbQDs, in this case cadmium sulfide in water, and we find it can preserve the optical properties after adding the oleic acid hydrophilic layer. Scintillation responses of WbQDs from cosmic rays (atmospheric muons) are the first step to use QDs as a particle detector, in particular measuring the time distribution which represents the decay time of QDs, and the photon emission spectrum. Experimental results are compared with a simulation developed in Geant4, a software toolkit for simulating particle physics processes. We investigate a potential of this material with special interest on neutrino physics including neutron tagging ability.



The effect of oligomeric amyloid-beta and tau incubation on cathepsin D activity and viability of differentiated neuroblastoma cells.

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Abstract

Alzheimer's disease (AD) is the most common neurodegenerative disease. It is defined by two physical hallmarks - senile plaques and neurofibrillary tangles, which are formed of the aggregated misfolded proteins amyloid-beta ($A\beta$) and tau, respectively. Physiologically the disease causes neuronal death and dysfunction and the mechanisms by which this occurs, as well as the type of misfolded protein that has the most damaging effect, are still in contention. Recent studies have shown that $A\beta$ oligomers internalise into neurons via the endosomal-lysosomal pathway, typically the cellular mechanism of protein degradation and recycling. However, it has been demonstrated that once internalised, $A\beta$ disrupts and inhibits the pathway.

To investigate this further, I have assayed the activity of a key lysosomal protease, cathepsin D, following $A\beta$ and tau incubation. Additionally, I have performed toxicity assays using viability fluorescence staining to determine which protein has the greatest effect on cell viability. I used differentiated SH-SY5Y cells as they are similar to neurons and thus give relevant results.

The cathepsin D assay has shown consistently that cathepsin D activity is upregulated following $A\beta$ and tau incubation, although $A\beta$ has a greater effect. Cathepsin D has been demonstrated to degrade $A\beta$ so it follows that this is the cells response. I suggest a longer incubation in future experiments to see if cathepsin D activity slows and to use this to model the effects on the endosomal-lysosomal pathway. The toxicity assay has shown that $A\beta$ is more toxic and thus likely to be a better target for therapies.

**COMMUNITY** BCUR 7ABCUR121
Community

What are match going Liverpool fans perception of foodbanks outside stadiums on matchdays?

Owen Dranfield

*Liverpool John Moores University, Liverpool, United Kingdom***Abstract**

With up to 16% of the population facing food insecurity, the number of foodbanks in the UK are seeing a meteoric rise. The number of people relying on foodbanks is currently being exasperated by inflation, which is now at 10.7%, and the cost-of-living crisis. This concerning growth of people facing food insecurity has lead football fan activist groups to set up their own foodbank initiatives, such as the Liverpool based, Fans Supporting Foodbanks. However, such initiatives often remain unsupported by the football club. This study utilises semi-structured interviews with fans of Liverpool FC to create a better understanding of their expectations in relation to the involvement of the club regarding fan initiatives. Furthermore, this study aims to examine the role and place of fan initiatives within CSR corporate social responsibly of the club. The results will help clarify the role of clubs regarding fan initiatives thus paving the way to increase the impact of such initiatives. Furthermore, this study will provide further insights into fandom and will aid in and aid the development of the club's engagement strategy, further enhancing the relationship between fans and club.



"Soft-Tissue Foreign Body Detection Utilising Ultrasound and General Radiography: A Phantom Based Study Employing a Survey"

Hannah Grocutt

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Abstract

Introduction

Soft-tissue foreign bodies (STFBs) such as wooden splinters, commonly result from punctures or lacerations in the extremities and if retained, pose health complicating risks (including infection).¹ Current guidance indicates the initial use of general radiography (x-ray) for STFB detection, however, this carries a future risk of cancer from ionising-radiation.^{2,3} Additionally, high fallibility has been observed for general radiography when imaging radiolucent (low-density) STFBs, leading to false-negative diagnoses.^{3,4} An alternative non-ionising-radiation modality is ultrasound.⁵ This study compared the STFB detection capabilities of ultrasound and general radiography.

Methods

Seven hand phantoms (soft-tissue mimicking models), were created to house foreign bodies of varying radiopacity (density) and were imaged using ultrasonography and direct-digital radiography. A blind survey of radiography staff and students at the University of Exeter was employed to determine the presence of a foreign body in each of the images.

Results

Respondents (n=50) achieved a mean sensitivity of 95% and a mean specificity of 90% in detecting STFBs under ultrasonography and a mean sensitivity of 53% and a mean specificity of 88% in the radiographs. Therefore, ultrasound was highly sensitive and specific in the detection of STFBs of varying densities, demonstrating superior STFB detection capabilities compared to general radiography.

Conclusion

This study indicated that ultrasound could potentially improve the STFB detection patient pathway, through decreasing false negative diagnoses and preventing unnecessary exposure to cancer-inducing ionising radiation. However, this study is only generalisable within its context, therefore a future in-vivo study would facilitate reliable data from which to build pathway adjustments.



The Way Restaurant Interior Design Affects Client's Behavior

Hana Khalil

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Abstract

A lot of previous research has been conducted on restaurants; however, very little research has addressed the effect of interior design on the customer's behavior. Literature showed that the interior design of a restaurant plays a highly important role in decision-making, some of which concluded that the different elements of style affect consumer's behavior. Other studies revealed that having a pleasurable experience is one of the main factors in choosing a restaurant, and layout is of a high importance. In the current research paper, the extent to which the interior design of a restaurant affects consumer's behavior in Egypt was examined. The results were gained through surveying a convenience sample of 100 students and graduates, via an online survey, of both genders in the age range of 17 to 31. The findings showed that the interior design of restaurants in Egypt affected people's emotions more than their behaviors. Food quality was found to be the main factor in a restaurant that concerns people in Egypt. Followed by that, was the cleanliness and then the decoration of the place. Restaurant color and furniture style were not of a high importance to people in Egypt as these elements were not highly considered when choosing a restaurant. Through the results obtained, restaurant interior designers would be able to design better restaurants to provide a unique dining experience for people living in Egypt.



Culinary Nationalism and Politics of the Household in Colonial Bengal

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Abstract

Food, as a 'total, social fact', is still an emergent field of research and by focusing on the connections between gastronomic choices and performances of banal nationalism, we could explore how everyday people made sense of historic changes in the course of their daily lives; and how they emulated, adapted or rejected new cultural influences, within the mainstream of their own changing national identity. There is a considerable amount of existing historiography on the connections between food and banal nationalism, however, I believe there is a gap in the literature when it comes to exploring these connections in the context of colonised Bengal. Bengal itself presents an interesting case of national consciousness and I believe it is important to explore and analyse how the people of Bengal made sense of these changes in the course of their everyday lives – how they negotiated with the colonial powers and influences, as well as the changing nature of Indian Nationalism; and I think studying these changes through the lens of food and culinary choices can help us better comprehend the nature of banal nationalism, specifically in the case of colonised communities. It also allows us to recognise and analyse marginalizations within the wider projects of nationalism; and looking at these concepts using a gendered lens further allows us to critically analyse the sites and symbols of everyday nationalism; and explore how the changing nature of the kitchen and household reflected dominant ideas of national identity and expression.



Influence of the entertainment industry on Chinese perceptions of the Korean destination image.

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Abstract

This study aims to analyse the influence of the entertainment industry on individuals and the perceptions of the South Korean tourism destination image.

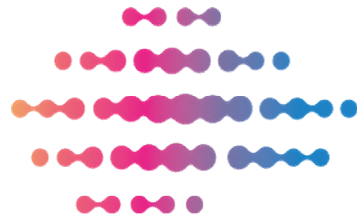
To achieve this, the study had the following research objectives

1. To evaluate the nature, level, and extent of the entertainment industry by assessing the marketing and promotional literature of Korea.
2. To examine the relative importance of aspects of the entertainment industry on the destination image of Korea.
3. To explore whether there are differences in perceptions of entertainment and destination image by undertaking a generational cohort analysis, while also examining the factors that influence such differences.

The research data were collected through quantitative questionnaires. Convenience sampling was used to recruit Chinese participants. A range of statistical methods in SPSS was used to analyse the data.

The study identified that the entertainment industry had a significant influence on how Chinese tourists viewed Korean products, services and finally destination image. Additionally, Korean popular culture, especially the film industry created a sense of cultural familiarity through historical dramas and food culture, therefore Chinese tourists viewed it as a positive factor. Additionally, different generations have different expectations and values, such as safety and emotional attachment to the destination.

Based on the findings of this research entertainment industry and events happening in the destination and tourist's country of origin do have a significant impact on how individual consumers perceive the destination.



• THE FUTURE BCUR 7C

BCUR126
The Future

AI in Pathology: A Medical Student's AI Assisted Crash Course in Diagnostic Histopathology of Large Bowel

Amy Stokes

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Abstract

Histopathology is the study of changes in tissue caused by diseases seen in tissue samples, carried out by certain doctors. Previous studies depict several concerns surrounding current histopathology teaching, including a lack of visibility and low morale. The aim of this study is to explore the effectiveness of an AI-assisted course in medical education of the histopathology of large bowel specimens.

Quantitative and qualitative data with an evaluation design. The hypothesis being “total accuracy scores will increase as the number of teaching sessions increases”. 6 medical students between the years 2-5 at the University of Exeter were recruited. The AI programme predicted a medical diagnosis for each tissue sample, each called a slide. 84 digital large bowel slides were analysed by the students, over 6 learning sessions. The students concluded a diagnosis for each slide and then compared their answers to the AI’s predictions. Confusion matrices were produced for each test and a total accuracy chart was formulated for each participant.

Total accuracy scores during the first training session ranged from 11.76% to 23.53%. Total accuracy scores at the final sixth training session ranged from 50.00% to 83.33%. Mean total accuracy percentage increase was 58.28%.

A positive relationship between test number and total accuracy score was found with all participants, although not always linear. AI technologies could be effective in teaching medical students the histopathology of large bowel specimens. Further research needs to be conducted to establish the effectiveness amongst a larger cohort.



An investigation into the positive potential of psychedelics to enter the mainstream health and wellbeing sector

Violet Coulston

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Abstract

This project investigates the positive potential of psychedelic drugs to enter the mainstream health and wellbeing sector. Following the Covid-19 pandemic, there is a need for treatments and products to both address the global mental health crisis, and to satisfy a new consumer appetite for self-care products that aid general wellbeing. Simultaneously, there has been a resurgence of psychedelics used for therapeutic purposes, altering societal perceptions. Although they remain illegal in the UK and most US states, their legalisation is predicted, and is anticipated to shift the future of health and wellbeing services.

A mixed method approach including literature review, talking to consumers and experts, observing digital landscapes, embodied research, and surveys was utilised to understand both consumer attitudes to and the risks and positive properties of psychedelics in the context of improving mental wellbeing. The research carried out concluded there is scope for psychedelics in the future of mainstream healthcare. Consumers displayed a need for and interest in the manifestation of this, with industry professionals concurring and confirming potential ways in which they might do so.

Much further research into this subject is necessary to action legalisation, but the positive outcomes that current research in this area is finding is indisputable. Should such research result in psychedelics taking a place in the mainstream wellbeing sector – as viable alternatives to current mental health treatments, and as products and services allowing people to manage their own wellbeing – the positive impact for mental health sufferers and the wider population could be enormous.



Adversarial Machine Learning Evaluation of The MaMaDroid Feature Space

Shae McFadden

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Abstract

Mobile malware is a threat which targets the security of cell phones and since the global population is reliant on smart phones and their technologies, malware is a serious, persistent, and pervasive global problem. Android malware applications makeup 6%-18.8% of all Android application. Machine learning classifiers are an important and dynamic defence against malware. In turn, since learning classifiers, like all other software systems are susceptible to attack, protecting the classifiers from adversarial machine learning is extremely important. Adversarial machine learning looks to alter either the training or testing data for the classifier to negatively impact the classification. The aforementioned impact could allow attackers to get malicious applications to circumvent security checks allowing the malware to spread freely from trusted application markets. This research will examine the malware feature extraction MaMaDroid and evaluate its: performance over time, susceptibility to adversarial attacks and the potential mitigating strategies.

**COMMUNITY** BCUR 7DBCUR129
Community

Position Perception in Migraine

Zaheera Mahmud, Christina Howard, Louise O'Hare
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Abstract

A study was conducted to investigate the relationship between position perception and resting state alpha band frequencies (Individual Alpha Frequency) in individuals with migraine. Although differences have been found in migraine groups (people with migraine) and control groups (people without migraine or a family history of migraine) in perceived motion direction, research has yet to investigate perception of position of moving objects. Hence, this study aimed to bridge that gap and hypothesized that slower resting Individual Alpha Frequency would be related to better performance in the position perception task. Moreover, as those with migraine may have differences in their alpha band oscillations, we expect those with migraine to perform differently compared to controls on the position perception task. 25 participants with 13 in the migraine group ($M_{age} = 27.70$, $SD_{age} = 6.65$) and 12 in the control group ($M_{age} = 28$, $SD_{age} = 8.42$) were tested. It was found that there was no difference in the Individual Alpha Frequency between migraine and control groups. However, there was a relationship between the Individual Alpha Frequency and performance error as individuals with a faster Individual Alpha Frequency made bigger mistakes. There was a speed effect as faster targets were more difficult to localize. It is unclear, however, why there was no difference in performance between the migraine group and the control group which might be from the mixed migraine group which included several subtypes. Future research can be conducted using separated groups of people with each migraine type to test this.



Challenges in caring for a genderqueer patient in a mental health crisis

Nathan-Jacques Le Blancq

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Abstract

Presentations of genderqueer patients to emergency services are becoming more common, but can still be rare and challenging territory for practitioners. This anonymised clinical case study explores the presentation of a young genderqueer patient to the ambulance service in a mental health crisis following a deliberate overdose.

Features of this case are explored including the reluctance to be treated or attend hospital, the steps taken to establish the background to these patient concerns, address them and achieve a satisfactory conclusion for the patient and practitioner. Following a positive outcome for the patient, patient feedback was provided which is included as well as a discussion of the current relevant evidence in this area of practice.



Self(ish)-Care, Is the marketisation of self-care oppressing or liberating single Gen Z women?

Georgie Sheridan

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Abstract

In 1988, African-American lesbian writer Audre Lorde alleged “Caring for myself is not self-indulgence, it is self-preservation, and that is an act of political warfare”. So how has the feminist act of self-care become an excuse to beautify ourselves at the expense of the male gaze? Self-care in the 21st century is now often promoted as a way for women to escape their responsibilities or avoid addressing larger social issues. The purpose of this paper is to identify and understand what single Gen Z women identify as self-care, to further consider whether they think the marketized link to self-love is liberating or oppressing.

In the context of feminist theory, the adaptation of a congruent mixed method model was used to interpret and analyse both quantitative and qualitative data. The data underpinned consumer's feelings towards masturbation as a form of self-care and their views of the stigma regarding the topic. It has been found that whilst the majority of women embark in self-care practices to de-stress and feel better mentally; it is activities that alter their physical appearance, such as pamper nights, that they are engaging in to feel better. This oppressive nature of pamper nights is explored throughout to understand the media and advertising representation of women's health and wellbeing.

Ultimately, this paper asks why are pamper nights viewed as a legitimate response to self-care and wellbeing, but masturbation is still codified as a practice shrouded in guilt and shame by gen z women?



Pre-operative Interventions for Smoking Cessation and Post-operative Complications: an Updated Systematic Review and Meta-analysis

Stephanie Asbridge

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Abstract

This review assesses whether interventions can help patients stop smoking before elective surgery. Smoking increases intra- and post-operative complications, whilst stopping smoking even shortly before surgery can improve heart and lung function and reduce risks. The pre-operative period may therefore be a golden opportunity for intervention. This review updates a Cochrane review (Thomsen et al., 2014) to reflect increasing research interest and assess the extent to which recommendations have been acted upon.

A literature search was conducted on 26 October 2022 to identify randomised controlled trials which: recruited patients who smoked prior to elective surgery; provided a smoking cessation intervention; measured abstinence from smoking at time of surgery and/or at 12 months, and/or incidence of post-operative complications. Nine new trials are included, totalling 20 studies in meta-analysis. Results showed that interventions can increase both short- and long-term smoking cessation, with intensive interventions with both behavioural and pharmacological components exerting greatest effect. No interventions affected post-operative complication rates.

Results broadly corroborate those of the Cochrane review, with the inclusion of additional trials yielding some new findings. This review highlights the importance of both behavioural and pharmacological intervention elements, and adequate intensity. In practice, pre-operative implementation of intensive combination interventions could help patients stop smoking prior to surgery and remain abstinent, reducing perioperative risks and long-term morbidity.

A large-scale cluster randomised trial of pre-operative smoking interventions delivered as part of standard practice across hospital sites is now required, which extends follow-up and assesses clinical applications with diverse patient populations.



Impact of Motion on Quantitative Cardiac MRI

Charel Junior Mangama Sindzi

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Abstract

Quantitative cardiac MRI (such as T1 and T2 mapping) has gathered a lot of attention from the scientific community over the last few years for the diagnostic of cardiovascular diseases. It is clinically used for the acquisition of Cardiac images since it provides an objective assessment of myocardial tissue properties without the implication of ionizing radiation.

To minimize the effect of respiratory motion for better imaging, the scans are acquired during a breath hold. However, despite these instructions, motion is still observed in up to 50% of subjects.

A way to alleviate this is to allow patients to breathe freely and acquire multiple signal averages (typically three), which helps minimise motion artefacts seen in the reconstructed images. However, free-breathing acquired images with multiple averages can sometime suffer from important respiratory motion artefacts and be of non-diagnostic quality.

A mathematical model which aims to quantify the impact of motion on quantitative cardiac mri was developed using generated signals recorded while applying the Modified Look–Locker inversion recovery (MOLLI) method for image acquisition. In comparison to not accounting for the impact of motion, knowing the impact of motion on T1 values assures the values to be calculated more accurately for medical use. Accurate T1 values of these tissues can significantly help in bettering the analysis of the heart function, viability, or myocardial perfusion.

This can be effectively used in medical settings to make decisions in which T1 values play a big part.



SUSTAINABILITY BCUR 7F

BCUR134
Sustainability

What's the big meal?

Harmonie Hampshire

University of Portsmouth, Portsmouth, United Kingdom

Abstract

Diet can be influential to a person's happiness and the extent to which they feel their eating behaviours are appropriate. This research investigates how vegan, vegetarian, pescatarian and non-vegetarian diets influence people's happiness and moral viewpoint. For example, if someone makes ethically correct decisions about their diet, would they feel better as a person? Aslanifar et al., (2014) concluded that vegetarians were significantly happier than non-vegetarians. My study used more independent variables to explore these attitudes. The independent variables were type of diet and gender; and the dependent variables were morality, happiness, and personality traits. A questionnaire asked about happiness, morality, and personality. Data was collected from 202 participants, and was analysed using SPSS and Excel. Research has not yet been completed, however, from current analysis it is anticipated that there are significant differences between male herbivores versus omnivores, and suggests that men have higher happiness scores on a vegetarian diet. This could also be the same for women but more analysis is required. In general, the research aims to show that there are higher happiness and morality scores for plant-based diets than meat-based diets among men and women. Although this is a small scale research project, I hope it contributes to a better understanding of how diet affects a person's happiness and morality. The value of this research area is that it can be used in the sciences and nutrition to investigate issues surrounding mental health and ways of using these factors to influence changes in diet.



A study on the causes of unsustainability within society and what societal adjustments are required in order to meet Cop21 and Paris Agreement Targets. To what extent are individuals responsible for unsustainable societies?

Oliver Watson

University of Warwick, Coventry, United Kingdom

Abstract

Society is facing a climate crisis; however, governments are expected to prevent this climate crisis alone. This is my primary reason for undertaking this research project, society expects that change must come from corporations and governments, however, the recent covid crisis has shown individuals must change their livelihoods in order for the global system to change. Therefore, I will be researching the extent of the role individuals play in our unsustainable society.

To understand individual unsustainability, I will carry out a survey amongst Warwick students to discover their habits and attitudes. I will then analyse pre-circulated research through literature and quantitative methodology (statistical trends) to comprehend these individual actions. I expect to conclude that individual actions are determined by social norms and the psychological distrust in sustainability, due to the prevalence of misinformation and the disbelief of a causal relationship between increased emissions and climate change.

My research is likely to discover that individual unsustainability is driving the consumerisation of economies globally and thus the manufacturing boom in China (responsible for 27% of global emissions). Individual habits are increasing demand for goods and services, which is increasing output in economies to unsustainable levels, consistently increasing pollution, waste and habitat loss.

This research should conclude that increased individual awareness will improve government sustainability, increasing participation and responsiveness. Therefore, future education and regulation of media, reducing misinformation on sustainability, is imperative to solve the global climate crisis especially if this research draws the expected conclusion that individuals have significant responsibility for unsustainability.



The Future of 'Zukunftsorte' - What is the part of the 'Zukunftsorte' in the urban transformation process?

Hendrik Franke^{1,2}, Georg Müller^{1,2}

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Abstract

They call themselves the 'real laboratory for the energy transition,' 'the smartest neighborhood in Berlin,' the 'Health City' or 'the German Oxford' - innovation hubs are grouped together under the name of Berliner Zukunftsorte. These hubs are part of the capital's strategy for the future, and are constantly being expanded. A closer look quickly reveals that it is not about attracting Tesla and Bezos. The aim is to find solutions for climate change or global health, to develop technologies and economic models for the cities of tomorrow, and to embrace social responsibility. Through hands-on research, the aim is to find out, for example: Which location-specific economic, business, or work models are being developed and applied? How can future locations improve the health of the city as a whole? What synergies and conflicting goals exist between urban development, urban health and medical research? As part of the project, students choose independent research focuses and investigate them over the course of the semester.

The X-Tutorial is conducted for students and by students. The current group of participants is composed by 15 participants from 13 different fields of study. X-Tutorials are a format of the Berlin University Alliance.

**COMMUNITY** BCUR 7GBCUR137
Community

Children's perception of the world of technology: through the lens of Heidegger

Valena Reich

King's College London, London, United Kingdom

Abstract

The Covid-19 pandemic has affected children's increasing use of digital technologies. Current research only concerns human mental and physical health but does not go as far as analysing our human meaning of being. This study expands the research to look at how computing technology impacts children's relationships with others, themselves, and the world.

The research is founded on focus groups (children aged 12-14) and uses Martin Heidegger's work 'The question concerning technology' to critically assess the findings regarding three types of relationships: children's relationship with nature, their relationship with other human beings, and their relationship with themselves. Findings revealed that children started with a positive judgement on whether computers make the world a better place, which changed to a more critical position after reflecting on how technology mediated their relationships with nature and human beings.

It is found that children working on their relationship with themselves could define a new meaning of being, independent of technology. Thereby, children's relationships with others could improve, perceiving them as human beings in themselves, and eventually with nature, not needing to optimally fulfil our human needs. Ultimately, it is argued that by working on these relationships, technology's negative impact on the world would be alleviated, making it more positive overall.

Whilst this study is small-scale, it offers rich qualitative insight and presents an introduction to a new way of critically analysing the impact of technology, calling for further research in this field.



How should universities respond to cases of sexual violence?

Rebecca Cole

University of Warwick, Coventry, United Kingdom

Abstract

My project examines how universities should respond to cases of sexual violence. This research is important because it provides results for institutions enquiring how to best respond to cases of sexual violence. Usefully, these results focus on how institutions' strategy and capacity to respond may be impacted by the environment in which it operates. My research fits well with existing research in Gender Law and Warwick's Community Values Education Programme.

In this project, I compared the difference in response to sexual violence cases between campus universities (University of Birmingham and Warwick), and city universities (Aston University and Coventry University) by analysing all documents available by the universities. I examined the preventative measures put in place to minimise sexual violence occurring at each institution through an evaluation of university policies and resources (including case reporting policies, the information on support available to victims, consent education, and preventative measures) available on their websites.

After researching each university, I created a report on their strengths and weaknesses according to the criteria for responses I have listed. These reports are thorough accounts, after detailed and smart searches, which aided my final report for this research poster.

This project provides institutions with an understanding of how responses to these cases are ineffective and outlines where they can start to seek steps for improvement. In my university, I have been encouraged to see a recent increase in publication and raising awareness of resources and support available for students dealing with cases of sexual violence.



How do white disadvantaged boys interpret their aspirations, identities and their motivations within the UK? The role of Neoliberalism.

Charley Lock

University of Portsmouth, Portsmouth, United Kingdom

Abstract

Michael Gove called for the UK to become an aspiration nation in 2010. However, 50% of universities have fewer than 5% socio-economically deprived white students enrolled. In addition, Caribbean men are the only group that has higher Not in Education, Employment or Training (NEET) rates than white British men. The jobs that white disadvantaged boys usually apply for have been eroded, so how do white disadvantaged men adapt when typical industrial jobs of the past have disappeared? This research uses semi-structured interviews at the beginning, middle and end of a careers intervention to compare differences in attitudes. This research will produce a discourse analysis of the interviews to see how their views on future aspirations, motivation and their own identities change. I anticipate finding that these students are more confident about their careers and are motivated to succeed due to linking the work they do in school and the benefit it will have to their future outcomes. The significance of this research could be in its usage to increase the aspirations, motivations and potentially the attainment of white disadvantaged boys through the use of this intervention. These findings could be used to understand how a low achieving group's identity is related to the educational system, a system dominated by tests, accountability and competition. In the future, I plan to use this research to begin a social enterprise, which allows schools to buy into this careers intervention, its resources and lessons and reinvest profits back into the community.

**COMMUNITY** BCUR 8BBCUR140
Community

A Qualitative Study of the Impact of the COVID-19 Pandemic on Theatres in Cardiff

Jade Beynon

*University of Warwick, Coventry, United Kingdom***Abstract**

This project adds to the ever-growing research being undertaken into the impact of the COVID-19 pandemic on the United Kingdom (UK) theatre industry. The project focuses on the impact of the pandemic on theatres in Cardiff, to expand the understanding of the effects of COVID-19 on Welsh theatre venues and arts centres. It looks at various types of theatres to paint a holistic picture of the impact of COVID-19, while also detailing different experiences of the pandemic in each theatre.

A rapid review of literature was undertaken to explore existing literature about the impact of the pandemic on the UK theatre industry. Interviews were then conducted with managers at three Cardiff theatres: the New Theatre, the Sherman Theatre, and the Wales Millennium Centre. A thematic analysis of interview data was completed. The results established that the pandemic was an overwhelmingly difficult time for Cardiff theatres, specifically concerning finances, staffing, and audience attendance.

The impact of COVID-19 on Cardiff theatres was that it created a period of uncertainty. Cultural Recovery Funding became necessary to keep theatres running, staffing difficulties were rife, and furloughing became widespread. Staffing issues have arisen post-pandemic, with unusually high staff turnover. Theatres have kept some adjustments made during the pandemic, such as the retention of digital services and staff option to keep working remotely. In addition, post-pandemic audiences are being selective about which shows they return to, with some demographics exhibiting anxieties about returning to the theatre at all.

Further research across the globe will be undertaken.



An Exploration into Intimacy as a Meaningful Occupation after Spinal Cord Injury in Women: a Scoping Review

Victoria Allum

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Abstract

Sexual dysfunction is a very common result of Spinal Cord Injury (SCI) however it is rarely addressed during the rehabilitation process, especially for women. As a result, many women are left feeling hopeless. Occupational Therapists and any members of the multi-disciplinary team need to understand the barriers that women may face to sexual intimacy in order to put together successful rehabilitation plans. This scoping review assessed the literature that exists currently surrounding women's experiences of intimacy after SCI. This review followed Arksey and O'Malley's Five Step Framework (2015). Current literature was found on five electronic databases using the same search terms. Literature selected had to be peer reviewed and published between January 2012 - January 2022. The literature searched initially showed the lack of research surrounding women's sexual health after SCI, therefore an anticipated research finding was that further research would be needed surrounding this topic. Multiple factors were currently seen as barriers and facilitators to intimacy there were, physical, psychological, partner and rehabilitation factors. There was a significantly higher amount of barriers found, with a recurring theme being a wish for more education during rehabilitation. This shows that intimacy is a meaningful activity in which women with SCI wish to participate in after their SCI. This could be achieved through more tailored rehabilitation. This research has shown that it is essential for Occupational Therapists to work with both women and their partners to identify specific needs that can help them to achieve sexual intimacy as it is a meaningful activity.



How public perception of the homeless presents itself on an interaction level in public space

Toby Pocock

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Abstract

The ballooning financial inequality in the UK has resulted in lifelong homelessness becoming widespread, with many of the lifelong homeless becoming marginalised from society. This is particularly alarming in consideration that there are 87,731 vacant homes in London alone (enough to house London's homeless 8x over using a 1:1 scale) (Geraghty, 2022; Willems, 2022). Anderson (1998) highlights that it is important to research the experiences of those excluded from society is necessary to understand the reality of these groups, therefore this study aims to gather data on how the public perceive the homeless.

The research will be ethnographic, using an observation method, where I will be collecting data through witnessing this field from my perspectives seeing things with my own eyes. Interviews will also be conducted too, to fill in substance gaps which observation cannot offer. By getting a closer look at the attitudes of the public and the ways these are portrayed in interaction, the findings can be used towards finding ways to inform the public through government response using state institutions. There are a lot of myths about homelessness and homeless people which form the large stigma which often negatively influences the beginning of any interaction regarding the public and the homeless. Many will hold empathy under 'lock and key', qualifying us to turn a blind eye to those in desperate need, even when confronted directly by the individual. This presentation will share the findings of my study and in future research studies.



Linking up the Cell: How does the Actin Cytoskeleton Interact with the Plasma Membrane?

James Lythall, Joseph McKenna, Lorenzo Figerio
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Abstract

The cell cytoskeleton is a network of cellular roads that link together different parts of the cell. The cytoskeleton is responsible for many important cellular processes, including the movement of organelles, nutrients and proteins within the cell. A protein called actin forms a major part of the cytoskeleton. We are interested in the interactions between the actin cytoskeleton and cellular membranes in plant cells, as these interactions are important for understanding how plants respond to disease-causing organisms. In plants, relatively little is known about the actin-binding proteins involved in these interactions. We tested a new technique to investigate these interactions, using tethered actin probes. Actin cytoskeleton filaments can be visualised by using fluorescent probes. These are genetically modified proteins that bind to actin filaments and fluoresce. We are interested in actin filament interactions with the cell membrane, so we modified these probes to tether them to the cell membrane. Using fluorescence microscopy, we then imaged the probes in live tobacco plant cells. Our results suggest that the tethered probes only highlight actin filaments interacting with the cell membrane. This provides the first evidence that these probes work in plant cells. The next step is to see if similar probes can be used to identify actin-binding proteins involved in cell membrane actin cytoskeleton interactions. By swapping the fluorescent portion of probe for an enzyme, we can label proteins near to the probes. These proteins can then be extracted and analysed to see if they interact with actin.



Exploring the Relationship Between Medication, Therapy, and Borderline Personality Disorder: A Critical Analysis.

Rebecca McKay

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Abstract

The management of borderline personality disorder continues to cause conflict in the field of psychiatry, concerning the content of clinical guidelines versus real life practice. While psychotherapy is promoted as the most effective treatment, a large percentage of patients are treated solely with medication.

The purpose of this paper was to conduct a literature review to explore whether a combined approach of medication and therapy would be more effective in the management of BPD than medication alone. An EBSCO search was conducted using key terms to identify the most suitable and up to date research to attempt to answer the question posed. 3 papers were chosen to be critically appraised out of a possible 165 articles.

Findings include a significant lack of good quality research regarding the efficacy of medication, and the difficulties faced by clinicians in prescribing for this complex client group. One of the key articles appraised, a retrospective cohort study, explores how participants in a DBT skills group significantly reduced their medication load compared to controls, who declined skills training. It is important to note that controls in this study were taking less medication compared to participants initially and possibly may be managing effectively on medication alone. Practice must address inconsistencies in the management of borderline patients through research, regarding the efficacy of a combined approach of pharmacotherapy and psychotherapy, for clinical guidance and practice to be in sync.



Implementing antibody screening to significantly reduce waiting times for cancer patients.

Andrea Peacock

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Abstract

Implementing p16 will bring faster diagnostics and treatments for patients with HPV related cancers and pre-cancers.

The sexually transmitted disease “Human Papilloma virus” (HPV) is responsible for causing 90% of cervical cancers, and 40% of head and neck cancers approximately. Currently there are over 143,000 people living on the Isle of Wight and there is no provision in place for making a diagnosis of HPV cancers and pre-cancers. Current protocol relies upon sending away patient biopsy samples, which is not only expensive but also leaves the patient waiting longer than necessary for treatment. By undertaking an extensive validation process to implement p16 antibody staining, waiting times for HPV cancer diagnostics can be reduced to just hours. Immunohistochemistry staining using antibody p16 was carried out on 40 tissue samples from known cases of HPV positive cancers, this was undertaken under controlled conditions as results are extremely sensitive to many environmental factors. Antibody p16 is a prominent biomarker for HPV related cancers and pre-cancers, it will assist with the grading of cancers, determine the type of treatment to give the patient such as targeted immuno-therapies specific for HPV cancers. Targeted immuno-therapies are playing a vital role in pioneering research worldwide, bringing hope that someday they will replace harsh cytotoxic chemotherapies. Many new immuno-therapies are becoming licenced for use, we can identify those who will likely benefit from these treatments by using biomarkers like p16.



SUSTAINABILITY BCUR 8D

BCUR146
Sustainability

What are the intentions behind Generation Z shopping sustainable fashion – is it for the betterment of the planet or for reputational benefits?

Emily Scott

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Abstract

In recent years, sustainability has been a primary driver in changing the fashion industry's landscape, with rising concern from consumers about the environmental impacts of their garments. The repercussions of global warming are disproportionate, with some countries, such as those in the global north and more developed countries (MDCs), contributing towards the damage the most, yet those in the global south and less developed countries (LDCs) are suffering the consequences. Therefore, there are reputational benefits for brands and individuals to lower their carbon footprint. This paper analyses the reputational benefits of shopping sustainably and the intentions behind Generation Z shopping sustainable fashion. An online survey, interviews, and in-depth wardrobe studies, with 84 Gen Z's, have been utilised, through online forums and synchronous conversations, identifying the intentions behind Generation Z shopping sustainably. Global factors, such as the cost-of-living crisis, have been considered, which have been proven to both assist and restrict consumers' sustainability abilities. Drawing from the theoretical framework of the Theory of Planned Behaviour, which assists in predicting a consumer's intention to engage in sustainable actions, combined with a mixed method funnel research strategy, the study evidence that Generation Z prioritises their self-image and are more likely to shop sustainably for the betterment of their reputation, over the improvement of the planet. This paper offers a unique perspective on the sustainable fashion industry and consumer behaviour. It actively encouraged participants during the study to reflect on their carbon footprint and assess their role in reducing global warming.



The Effect of the Lunar Cycle on Nocturnal Behaviour in Captive Cape Porcupine (*Hystrix africaeaustralis*).

Hannah Maudsley

University Centre Reaseheath, United Kingdom

Abstract

This study will determine if a relationship between perceived behaviours and lunar phases is present in captive Cape Porcupines (*Hystrix africaeaustralis*), a nocturnal species frequently found in captive UK collections. Previous research on wild populations of *Hystrix* species found that the lunar phase can limit activity levels (Mukherjee et al., 2018). Studies found the correlation can be a predator avoidance tactic in response to moonlight exposure. Across four months, recordings of nocturnal behaviours aligned to distinct lunar phases will take place. Subjects include adult porcupines (one male, two female) at Reaseheath Mini Zoo. A self-made ethogram based on previous behaviour studies will identify behaviours. Data will be recorded at 30-second intervals using instantaneous scan sampling (Gilby et al., 2010). Two trail cameras will be utilised in the indoor/outdoor enclosures recording between 7 pm-7 am. The hypothesis for the study is that lunar phases with lower amounts of moonlight will cause more varied behaviours. These findings will provide information on how the lunar cycle affects porcupine behaviours. As captivity can alter natural diel patterns, knowledge of lunar-behaviour relationships allows collections to adapt husbandry and care, encourage natural behaviours, and benefit the animal's welfare (Berger, 2011; Rose & Riley., 2019). Further research into lunar-behaviour relationships involving different nocturnal species can develop from this study. Discovering correlations in other species may change how their housing and conservation efforts are approached and promote changes to their standards of care, aiding collections to understand the necessary provisions and modifications nocturnal species require.



Development of reliable analytical techniques to investigate the effects of nano-sized plastic waste degradation products on human health

Aiseta Konteh Bacthilly

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Abstract

There is an emerging evidence base that links plastic toxins and metabolic diseases. In addition to the physical problems associated with plastic debris, plastic has the potential to transfer toxic substances to the food chain by ingestion or inhalation. Micro/nano plastics are plastics that are between 1 μm - 1nm due to their small size they highly contribute to these issues. Individuals living in plastic polluted areas such as proximate to landfills, waste incineration sites, or manufacturing factories are more susceptible to inhale or ingest these plastic contaminants. The aim is to develop new analytical techniques to identify nano-sized plastic contaminants in fluids and toxicology assessment of nano plastics in human health using cellular studies employing in vitro systems that are relevant to the predicted human exposure. This will apply wide array of analytical, biochemical, and cellular techniques including High performance liquid chromatography (HPLC), cell culture, cell-based assays, and fluorescent microscopy to investigate effects of nano-sized plastics on cellular health. New analytical methods to detects, characterise and identify microplastics will need to continuously be implemented and developed by future research efforts in order to improve reliability of data generated from these investigations.



Politics, Relationships, Well-Being, and Moral Foundations

James Kennedy

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Abstract

The goal of this study was to explore factors that might explain why people are able to maintain cross-political party close relationships (and why those relationships sometimes dissolve). We examined if certain moral foundations predict whether an individual will be more open to cross-political party relationships.

My faculty mentor and I surveyed college students regarding their moral foundations and cross-party close relationships. The participants were surveyed using a pre-established moral foundation questionnaire along with our Cross-party Relationship Openness Questions. We discovered two groups that divided the five types of moral foundations. Individuals who scored highly in the first two foundations of Harm/Care and Fairness/Reciprocity were generally less open. (Foundations typically more endorsed by liberals). Individuals who scored highly in the three foundations of In-Group/Loyalty, Authority/Respect, Purity/Sanctity (which are typically more endorsed by conservatives), were found to be more open.

Individuals higher in the first two foundations are willing to learn about others who have political views different than theirs; however, they did not show any interest in maintaining a relationship. Individuals higher in the last three foundations are open to learning about people who do not agree with their political views and are also willing to begin and maintain close relationships across party lines.

This project is part of a larger series of studies in progress that can continue to uncover insights into understanding contemporary political divisions and helping to bridge polarization and facilitating political discourse with close relationships across party lines.



Online advocacy and digitalised workplaces: are prospective barristers prepared?

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Abstract

From digital case management systems, such as the Common Platform used in criminal courts to the increase in remote hearings (for example, in 2020/21 86% of family court users attended a remote hearing), prospective barristers are entering a new workplace. Yet, there is little research into whether prospective barristers are prepared for it. This research asks whether the Bar Training Course (a postgraduate course providing prospective barristers with the professional skills to practice) is preparing them for digital workplaces and online advocacy. An initial literature review illustrated the broad themes of the research, including the digitalisation of work and the digitalisation of the legal profession. A PESTLE analysis complemented this to show that digitalisation is impacting the Bar, emphasising further why the research is necessary. However, online details about the course did not show whether the advocacy component of the course covered online advocacy or whether prospective barristers were introduced to digital workplaces. Instead, interviews with practitioners teaching the course answered these questions, showing that the Bar Course does not prepare prospective barristers for digitalised workplaces or online advocacy. Neither is taught nor do students have the opportunity to practice due to technological limitations or pessimistic perceptions about teaching it. These findings demonstrate a dialogue with the Bar Standards Board and Bar Course providers is necessary to emphasise the importance of these skills. As such, this research recommends integrating classes on remote hearings and allowing course providers access to digital case management systems so prospective barristers can practice these skills.



Manufacturing Electrospun Polycaprolactone nerve guidance conduits for Peripheral Nerve Repair

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Abstract

Injuries to the peripheral nervous system result in painful neuropathies owing to partial or complete loss of sensory and motor functions. The current 'gold standard' for repair is nerve autografting, however it has significant limitations such as donor site morbidity, limited supply, multiple surgery sites etc. Nerve guidance conduits (NGCs) are now being considered as a favourable, alternative treatment for PNS injuries.

NGCs, with varying fibre diameters, were manufactured via electrospinning. NGCs were electrospun using three different PCL solutions; 10 w/v% PCL in DCM, 10 w/v% PCL in DCM:CF (1:1) and 8 w/v% PCL in DCM:CF (1:1). Conduits were imaged using scanning electron microscopy to observe fibre diameter, alignment and conduit wall thickness. NG108-15 neuronal cells were seeded onto conduits, for 6 days, at a seeding density of 30,000 cells per sample. Resazurin, Live/dead analysis and Immunolabelling was performed to observe NG108-15 neuronal cell proliferation, viability and neurite outgrowth.

SEM analysis confirmed conduits manufactured were fibrous and in a random orientation. Average fibre diameter of fibres manufactured from the different solutions and electrospinning parameters ranged from 4.5- 9 μ m. All substrates supported NG108-15 neuronal cell proliferation and were deemed biocompatible, with cell viabilities above 90%.

Neuronal differentiation studies confirmed 8% DCM:CF conduits supported significantly higher average neurite lengths compared to 10% DCM:CF and 10% DCM.

Our results motivate further study in the field of NGCs to better facilitate peripheral nerve repair by using specific fibre diameters in the construction of nerve guidance conduits.



An Exploration of the Relationship Between Physical Spaces and Accommodation on Campus and Student Experience.

Olivia Lily Collins

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Abstract

This project explores the impact of the different accommodation options at the University of Warwick (UK) on student experience and how this disproportionately affects Widening Participation (WP) students. Widening Participation students are those from disadvantaged backgrounds, who are also often underrepresented in student communities. Through the analysis of marketing and critical material, and the collection of data using a survey, this project demonstrates the clear stratifying impact that accommodation has on the student community. The survey collected answers from 27 elective respondents across different demographics at the university. Data collected was analysed using thematic and content analysis, as well as using the quantitative data collected to establish correlations between negative experiences of on-campus accommodation and WP identity. This inequality manifests notably in students' experience of social relationships and environments on campus, as expressed in many participant responses. This project advocates for the greater standardisation of the accommodation options provided by the University of Warwick to help support WP students' sense of belonging in the university community, and for efforts to be made to better unify the student population. It is central to this project that the data collected is not intended to be wholly representative, but that it proves that accommodations provided negatively impact some WP students, and that 1 student negatively impacted is too many. Going forward, this research calls for further investigation with a wider pool of participants at the University of Warwick, and in the UK more generally to move to a more inclusive higher education system.



An Investigation Into the Effect of Increasing Intensity of Electric Shocks on Olfactory Associative Learning in *Drosophila*

Julian S Jung, Katie Greenin-Whitehead, Andrew C Lin

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Abstract

Neuroscience research has so far focussed on the cellular architecture of neuronal networks, leaving the following question largely unaddressed: Is neuronal circuitry optimal for its function and if so, how?

As the fruit fly *Drosophila melanogaster* is a common model organism, its molecular mechanism for associative learning (e.g. avoiding an odour after encountering it with punishment) is known. Rather than encoding the memory of the first encounter by strengthening (potentiating) the appropriate behaviour (i.e. avoiding a negatively-trained odour), the inappropriate behaviour (i.e. approach for negatively-trained odours) is reduced (depressed). However, the question remains: Why has this network evolved this way?

The hypothesis was that due to the mode of neuronal integration (i.e. how an action is chosen), depression outperforms potentiation in encoding memories reliably. Two models were proposed for the mode of neuronal integration: divisive normalisation, which could explain an evolutionary advantage of depression over potentiation, and softmax, which could not.

For the experiments, I used a standard fruit fly strain. Flies were tested individually in chambers where they were trained to avoid the odour by electric shocks and later tested for their learned avoidance. Statistical analysis of the behavioural data failed to reject the softmax model (null hypothesis).

Therefore, the results do not answer the question why depression is used in memory encoding in *Drosophila*. However, they open the field to novel hypotheses and further investigations.

For example, experiments on a cellular level could consolidate or challenge these results, contributing to the evaluation of behavioural data in neuroscience research.



Effects of Alzheimer's Disease Risk Factor BIN1 on Calcium Channel Surface Expression and Resulting Calcium Flux in Neurons

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Abstract

Alzheimer's Disease (AD) is the leading cause of dementia, afflicting over 32 million individuals. Promisingly, genome-wide association studies identified *bridging integrator 1 (BIN1)* as the second leading AD genetic risk factor. Yet, BIN1's contribution to AD is poorly understood. Traditionally, BIN1 transports L-type voltage-gated calcium channels (LVGCCs) in cardiac cells to the cell surface, increasing calcium intake through these channels. In neurons, increased calcium intake drives neuronal hyperexcitability – a hallmark of AD. Interestingly, BIN1-overexpressing neurons exhibit hyperexcitability, raising the question: as in cardiac cells, does BIN1 mediate LVGCC surface localization in neurons to induce calcium entry and resultant neuronal hyperexcitability?

Addressing this question, we overexpressed BIN1 in neurons to exaggerate BIN1's effects to detectable degrees. mCherry-expressing neurons with normal BIN1 levels represented a negative control. Neuron surface proteins were tagged with biotin and isolated using avidin beads that bind biotin. Then, LVGCC surface levels were compared across conditions via western blotting to determine if BIN1 mediates LVGCC surface localization. Finally, calcium imaging was performed to assess whether BIN1 increases calcium intake – evidence of neuronal hyperexcitability.

While western blotting is preliminary, we anticipate BIN1 overexpression to increase LVGCC surface expression. As revealed by imaging, BIN1 overexpression increased calcium intake via surface LVGCCs, thus inducing neuronal hyperexcitability. These data bolster BIN1-dependent neuronal hyperexcitability as a newfound mechanism of AD, empowering discovery of novel AD treatments. Next, animal testing is necessary to develop and translate BIN1 therapeutics. Indeed, targeting BIN1 will propel drug innovation for patients suffering from AD globally.



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Poster Exhibition

PosterExhibition091
Health

Association between visual acuity and teen driver visual reaction time to safety critical events in a driving simulator

Kaiden Kennedy, Benjamin McManus, Despina Stavrinou
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Abstract

Visual acuity (VA), the ability to visually discriminate two stimuli separated in space, is a common driver's licensing testing requirement. Many states require 20/30 vision at a minimum. Myopia, worsening VA, has increased worldwide, with the youngest ages most affected. VA's relation to motor vehicle crashes (MVCs) have been examined, but few studies have investigated vision's relationship with visual reaction time, particularly among teens whose most common cause of death are MVCs. This work examined VA and hazard reaction times in licensed and unlicensed teens aged 16-18 years. VA was assessed via a Sloan Letter Chart with Snellen equivalent measurements in 190 adolescents from the southeastern United States (Mean age=17.12 years). Licensed adolescents (n=81) were enrolled within 2 weeks of receiving their driver's license. Unlicensed adolescents (n=109) had no prior driving experience. Participants drove in a high-fidelity driving simulator and encountered five safety critical events (SCEs; e.g., vehicle/pedestrian suddenly nearing driver's pathway). Eye tracking assessed visual reaction time and glance length. Regressions indicated those with VA of 20/30 or worse (n=16) visually reacted significantly faster to the SCEs but looked at them for less time. Regardless of VA or licensure, visual reaction time was faster to pedestrian SCEs compared to vehicle SCEs. Licensure is not associated with visual reaction or glance length to SCEs. These results suggest further examination of VA as a screening tool for licensure among teen drivers and highlight the potential a driving simulator can have as a supplemental screening tool.



The association between religiosity and subjective well-being: The mediation effect of self-efficacy and resilience

Hiu Yin Choy

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Abstract

The long-lasting COVID-19 pandemic has compromised subjective well-being (SWB) of everyone. Accumulating evidence has reported significant rises in depression and anxiety. The present study aimed to examine whether religiosity affects people's SWB via the mediating roles of self-efficacy and resilience under COVID-19. Religiosity is hypothesised to be positively associated with SWB, while self-efficacy and resilience are hypothesised to mediate the association between religiosity and SWB. The two mediators are also hypothesised to function as chain mediators in the religiosity-SWB association with self-efficacy followed by resilience. The research finding will provide new knowledge to understand how religiosity impacts SWB under the pandemic. At least 100 community adults will be invited to join this cross-sectional study to complete an online self-administered survey questionnaire. The measures include the Perceived Stress Scale related to COVID-19, the Santa Clara Strength of Religious Faith Questionnaire, the Satisfaction with Life Scale, the international positive and negative affect schedule short-form, the General Self-Efficacy Scale, and the Connor and Davidson Resilience Scale. Data collected will be analysed using PROCESS Model 4. The study would contribute theoretically to understanding the relationship between religiosity and SWB, and the mechanism of self-efficacy and resilience affecting SWB. Meanwhile, the study could provide empirical evidence for international scholars to understand people from Chinese society. Training practices that promote high levels of religiosity, self-efficacy and resilience would be recommended.



‘What do they turn to in their dark hours?’: An interpretative phenomenological analysis exploring how religious and spiritual beliefs may facilitate or hinder coping during adverse life events, specifically the COVID-19 pandemic.

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Abstract

An ever-prevalent debate within society lies in the phenomena of religion and spirituality, and how these beliefs may either improve an individuals' life, or whether they hinder them and their perception of reality. Currently the world is recovering from the devastating impact of COVID-19, highlighting the need for reliable coping mechanisms. With an increasing body of research into how religion or spirituality may be beneficial for coping, a unique opportunity has arisen to explore how these beliefs may have facilitated or hindered coping during the pandemic. In this study an interpretative phenomenological analysis was conducted through semi-structured interviews with six participants, identifying as either Christian, spiritual, or both. As a result, three superordinate themes were established: 1) 'I feel looked after', entailing the support networks developed through faith, 2) 'It's not a mistake', entailing the appraisals of meaning encouraged by faith, 3) 'It's made me feel more capable', entailing the development of an identity that appears to provide emotional buffers against the negative impacts of adversity. From this, there is the suggestion for further research to explore a wider range of religious and spiritual beliefs to establish any similarities or differences in their interaction with coping. There should also be a consideration of non-religious individuals to explore whether the facilitation of coping is simply due to extrinsic factors of faith such as community, positive appraisals of meaning, and certain personality traits, as opposed to the interaction of a relationship with a higher power.



The Effects of Deleting Interleukin-33 in Mice on Behavior

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Abstract

Anxiety is a significantly prevalent mental disorder amongst the general population. A previous study conducted by the lab I am in indicated that there lies a potential connection between the lack of Interleukin-33 and a decrease in social recognition and anxiety. The current study consists of behavior tests and investigating the physiological makeup of the brain between mice with and without IL-33. The primary goal of this project is to establish a solid foundation to identify and understand how these changes originate in the brain. A previous paper that was published, "Behavioral Changes in Mice Lacking Interleukin-33" indicated a potential correlation between the lack of IL-33 and a decrease in social recognition and anxiety. The research and data analyses are still ongoing. So far, an open-field and elevated plus maze test have been conducted to investigate the social anxiety levels of mice with and without IL-33. I intend to further my investigation through comparing the brain makeup between these two experimental groups. However, any indication of a decrease in social anxiety levels could be a potential breakthrough in understanding anxiety. This could lead to advances in medication for anxiety by depicting a source for the problem. I will continue to further my research throughout the years by conducting more experiments that establish a strong backbone for the source and cause for social anxiety.



Effectiveness of Antimicrobial Stewardship on Patients With Urinary Tract Infections

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Abstract

Objectives:

Although several studies have shown that the application of antimicrobial stewardship (AMS) has a positive impact on reduction of antimicrobial resistance and therefore the clinical outcomes of patients, most of the studies were conducted some years ago, and there have been no recent reviews that specifically measures the impact of AMS on urinary tract infections (UTI) caused by *Escherichia coli* (*E. coli*).

Methods:

This systematic review and meta-analysis followed the Preferred Reporting for Systematic Review and Meta-Analysis guidelines. Three electronic databases were searched: Cochrane Review Library, PubMed, and Medline for studies published from 2007 to 2022. Relevant literatures were independently searched by two authors using the inclusion/exclusion criteria. The outcome was presented in percentage change and forest plot.

Results:

A meta-analysis of the included studies demonstrated a 3.65% reduction in the antimicrobial resistance rate after AMS intervention.

Six studies provided data on resistance change for at least three different antimicrobials, while four studies reported information on fluroquinolones resistance only. Interestingly, studies that stopped or switched certain antibiotics achieved the highest antimicrobial resistance reduction (9.43%) compared to other methods of intervention ($P = 0.02$).

Conclusion:

Our findings suggested that the introduction of antimicrobial stewardship programme could reduce *E. coli* resistance seen in adult patients with urinary tract infections, both in the hospital and in the community. Various measures contributed to these findings such as the involvement of the multidisciplinary team, regular ward audits, and monthly educational teachings.



Are Pulmonary Embolism Decision Aids Valid in the COVID-19 Era?

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Abstract

Background: COVID-19 increases patients' risk of developing pulmonary embolisms (PE) and decision aids are tools that can be used to help risk stratify patients.

Objective: To assess the use of PE decision aids in adults with COVID-19 where PE is considered as a possible diagnosis.

Methods: Papers were found by searching keywords such as 'COVID-19' and 'PE' using five databases (Ovid MEDLINE, Ovid EMBASE, EBSCOhost CINAHL, PubMed and The Cochrane Library). Inclusion criteria included adults with COVID-19. All articles were published in English and from 2020.

Results: 53 papers were identified and 18 were relevant. A total of 13813 participants were included in this review. There is limited evidence available. The majority of patients included were hospitalised and from a single centre, thus the results may not be generalisable. Confounding factors such as vaccination status and subjective decision-making tools may have influenced results. Of the 16 cohort studies, the prevalence of PE identified on computerised tomography pulmonary angiogram in COVID-19-positive hospitalised patients ranged from 1.8% to 60%. However, the test threshold for the investigation of PEs is known to be 1.8%. This review suggests that COVID-19 may increase the probability of PEs to above the test threshold and therefore new COVID-19-specific algorithms are required. New COVID-19 algorithms may incorporate varying d-dimer cut-off levels

Conclusion: The objective has not been achieved adequately due to the limited high-quality evidence available. The limited evidence suggests that new decision aids will need to be developed and validated for COVID-19 patients.



Tenascin-C Reduces Expression of Tissue Factor Contributing to Reduced Arteriovenous Fistulae Failure

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Abstract

End-stage renal disease (ESRD) is experienced by over 6 million people in the United States alone and ranks as a top 10 leading cause of death. Arteriovenous fistulae (AVF) are the gold standard hemodialysis for patients with kidney disease. However, the poor rates of AVF maturation require venous remodeling for better outcomes for patients. The failure rate of 60% calls for more research on remodeling the AVF for better patency rates. Tenascin-C (Tn-C) is an extracellular matrix protein that is expressed primarily during injuries and inflammation, and Tn-C proliferates inflammatory factors, such as Tissue Factor (TF). Tissue factor is a transmembrane protein in subendothelial tissue that initiates coagulation, aggregating platelets, and fibrin into blood clots. TNC enhances the pro-inflammatory phenotype of macrophages. Its deletion inhibited the expansion of M1 but enhanced that of M2 in a MI mouse model. In vitro, TNC/TLR4 enhanced the M1 macrophage polarization of bone marrow-derived macrophages but inhibited the up-regulation of the M2 macrophage marker by suppressing interferon regulatory factor 4 (IRF4). In murine aortocaval models, the absence of Tn-C increases M2 polarization and TF, leading to a more thrombogenic environment in AVF. Despite the negligible difference in red blood cells and collagen, fibrin was significantly higher in Tn-C KO mice, compared to Wild-Type mice. Overall, modulating Tn-C expression may serve as a translational research strategy to reduce AVF failure rates.



SARS-CoV-2 Infection of the Human Brain

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Abstract

SARS-CoV-2 is a respiratory disease, however, it is known to affect multiple organ systems, including the nervous system. Neurological symptoms have been previously reported to occur with SARS-CoV-2 infection, however the mechanisms through which the virus is associated with these symptoms is unknown. Previous studies have indicated some evidence of neural invasion of SARS-CoV-2 among postmortem COVID-19 patient brains [1]. Here, we examine fifty-five human brain tissue samples from twelve different postmortem COVID-19 patient brains using immunohistochemistry to identify the presence of SARS-CoV-2 spike protein among the tissue samples. The samples included tissue from the hippocampus, midbrain, pons, medulla, and olfactory tracts. Chromogen staining was utilized to stain the tissue. Through microscopic analysis, the presence of SARS-CoV-2 spike protein was identified in over a third of the tissue samples among multiple brain regions. The findings of this study will be furthered to identify the specific cell types infected by SARS-CoV-2 in the human brain.



Effect of acute oxytocin administration on social behavior in male and female mice

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Abstract

Oxytocin is a neurotransmitter and hormone with a well-established role in prosocial behaviors in animals and humans. It is currently being tested in clinical trials for the treatment of social symptoms associated with autism spectrum disorders. However, the behavioral effects of oxytocin treatment have been variable with both prosocial (increased empathy) and antisocial (increased competitiveness) behaviors resulting in humans. Previous studies in our lab have shown increased anxiety-like behaviors in mice treated chronically with oxytocin (12 ug dose per day for 14 consecutive days, data unpublished). The current study aims to see the effect of acute oxytocin administration on social behavior in male and female mice to determine if the schedule of oxytocin administration affects behavioral outcomes. Adult C57BL/6J mice will be acutely pretreated with saline or oxytocin (12 µg) an hour before the behavior tests. Saline or oxytocin will be administered either intranasally (i.n., 12 ug in 12 uL, 6 uL per nostril) or intraperitoneally (i.p., 12 ug in 120uL). Mice will complete a battery of behavioral tests including the elevated plus maze (EPM), three-chamber sociability task (3C), and free dyadic social interaction (FDSI) after drug administration to determine changes in social behavior and anxiety-like behavior. Noldus EthoVision XT and human coders will code anxiety-like behaviors, social preference, and social novelty. I expect to find that acute oxytocin administration will increase sociability as measured by the 3C and FDSI tasks while avoiding increases in anxiety-like behaviors, as measured by the EPM task, associated with chronic administration.



Testing for the monovalence/divalence of the PreTCR complex

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Abstract

My research was on the divalence of the PreTCR complex essentially whether the Pre-TCR complex is one structure or two combined. But what is the preTCR complex? The pre T Cell Receptor complex is two developmental stages before the mature T cell. T cells come from stem cells in bone marrow and differentiate in an organ called the thymus and are an integral part of the immune system. To be able to experiment these various biological techniques were implemented to essentially create the constructs needed to test this hypothesis. Once said constructs were completed a split Venus assay was implemented essentially, a fluorescent protein is split in half and attached to the two domains/proteins you are testing, if they are close enough in proximity, they combine and become fluorescent becoming yellow and is picked via flow cytometry in the YFP channel. So if it was two separate structures the protein would dimerise and be picked up. But since it was not the pre-TCR complex is a monomer. My research allows for further understanding of how bodily systems function as by further understanding the baseline of TCR development it may give more insight into where they go wrong e.g., in acute lymphoblastic leukaemia. This may possibly in the future allow for identification of new therapeutic targets to cure said incurable diseases.



NHS - Fractured Medical System

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Abstract

The NHS has experiences problems that have hindered it from efficiently delivering health services, especially during and post-pandemic. Some indicators of inefficiency at the NHS include poor access to medical services, longer waiting times, and investigations that stem from tragic occurrences. This research paper sets out to investigate the courses of the problems that make the NHS inefficient. Firstly, I will conduct a literature review and review journal articles on the subject. In this section, I will focus on understanding what the writers of the articles I review consider the problem to be. Subsequently, the paper will provide the methodology used to collect the data. This section will be followed by a data analysis section where a thorough analysis of the data collected to establish the causes of the problems at the NHS. The research will focus solely on the data collected only and not any other information outside the data. A section on results and discussion will follow the data analysis. The paper will provide the findings from the research and a commentary on what the findings mean concerning the causes of the problems at the NHS. Finally, the report will close with a conclusion that summarizes the research's key points and findings. In addition, the conclusion will include brief recommendations on what should be done to address the causes of the identified problems at the NHS.



Physics-Informed Fully Connected and Recurrent Neural Networks for Cardiac Electrophysiology Modelling

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Abstract

Cardiac arrhythmias is a leading cause of morbidity and mortality, but their mechanisms are incompletely understood. Arrhythmias arise from various disruptions in the generations and propagation of cardiac action potentials (APs), which lead to irregular contractions of the heart. Mathematical models of AP propagation, described using ordinary (ODE) and partial (PDE) differential equations, can help understand specific mechanisms of arrhythmogenesis. However, application of such complex models is hindered by high computational costs of their numerical solution. Deep learning (DL) models have emerged as a novel and efficient way to solve ODEs/PDEs and overcome the drawbacks of traditional numerical methods. Specifically, Physics-Informed Neural Networks (PINNs) combine precise mathematical form of equations with the computational efficiency of DL. In this study, we develop novel DL models to solve the Fitzhugh-Nagumo equations (FNE) that describe APs in single cardiac cells and 3D tissues. The training datasets were created using numerical solutions of the FNE. PINNs were based on the incorporation of FNE into the loss function. Two neural network architectures were employed: fully connected (FCNN) and recurrent (RNN). FCNN and RNN with a mean squared error (MSE) loss function were used as a baseline. The DL models were also evaluated using the MSE score. All PINN models achieved comparable performances in simulating single-cell APs, with a typical MSE of 10⁻¹. Physics-Informed FCNN and RNN showed the best results in simulating both normal and arrhythmogenic waves in 3D, with MSE of 10⁻². Therefore, PINNs can provide efficient tools for simulations of cardiac arrhythmias.



Understanding plant systemic immunity using whole plant imaging with novel reporter constructs

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Abstract

A wide variety of effector proteins are secreted by plant diseases to weaken host defences and increase pathogenicity. Effector-triggered immunity, which is started by the recognition of pathogen effectors by intracellular or plasma membrane-localized immune receptors, is one of the defence mechanisms built into plants to fight harmful pathogens. The Hypersensitive Response (HR), which induces local cell death to stop the spread of the pathogen and a number of long-distance electrochemical/physiological signals to create systemic immunity, or Systemic Acquired Resistance, is a key feature of ETI (SAR). The goal of this study is to investigate the difficulties involved in achieving SAR and how they affect the spread of two recently discovered SAR components, A70 expression and electrical potentials. Using the model pathosystem *Arabidopsis thaliana* and avirulent *Pseudomonas syringae* pv. tomato DC3000avrRpm1 we show that ABA is a negative regulator of HR, where pre-treatment both delays and restricts the extent of cell death resulting in downstream impacts on SAR activation signalling. Using the luciferase reporter construct A70::LUC revealed that the construct expression is induced by a gene-for-gene response.



Investigating the potential benefits of Vitamin D, C, and zinc treatment in T-cell based immunotherapies

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Abstract

Immunotherapy is an emerging field of cancer research that is changing the way we think about cancer therapy. It is based on our immune system's innate ability to fight cancer and the goal is to find ways to enhance this ability. It is established in the literature that elevated levels of Vitamin D, C and zinc are associated with improved outcomes in different cancers. The aim of this project was to use vitamin D, C and zinc as adjuvants that offer attractive opportunities to potentiate the killing activity of T cells. For this purpose, T cells were pre-treated with different concentrations of Vitamin D, C, and zinc or combination and the level of granzyme B secreted by T cells was measured as a biomarker of cancer immunotherapy. Also, the activation status of granzyme B was assessed using a scientific tool. The results showed that Vitamin D and combination (all 3) treatments significantly increased granzyme B concentration secreted by T cells. Granzyme B was found to be inactive inside T cells, however, activation is likely associated with the secretion pathway. The results indicate that simple adjuvants can potentially enhance cancer cell killing activity of T cells. Immunotherapy can offer increasingly effective patient-specific treatment without the need for unpleasant side effects of chemo/radiotherapy treatments. The killing potential of T cells against cancer cells can be assessed in future experiments and can lead to a full-scale study to investigate the clinical potential of this work and increase the efficacy of cancer immunotherapy.



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Queer counter-publics in digital China: Weibo discourse under state censorship

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Abstract

In contemporary China, the LGBTQ+ community suffers from several types of marginalisation and discrimination. The government heavily controls the media and has steadily clamped down on press freedom. In a society where heterosexual norms have been reinforced by mainstream media, social media provide a platform for strengthening or subverting the dominant messages. The aim of this research is to explore how Chinese netizens discuss the official stigmatisation of homosexuality on Weibo. This study employs critical discourse analysis and framework of Encoding and Decoding to analyse the top-down messages on the topic and their bottom-up interpretations. I focus on a particular case of a medical textbook pathologizing homosexuality, analysing both a Weibo post that criticises such framing of homosexuality and about 300 comments as an important spontaneous reaction of (mainly LGBTQ+) Weibo users to the framing of homosexuality in the textbook. I argue that these Weibo users are attempting to create a counter-public in a variety of ways, including repeatedly reinforcing a sense of collective identity through first-person plural pronouns; attempting to bring people together by using @ mentions; and engaging in the discussion through strategic tools like emojis. Discussing discourses on social media can provide a better understanding of the digital LGBTQ+ community in China and produce recommendations for future policy making. Further research should put more focus on digital social movements, including LGBTQ+ self-organizing in China and explore the specificity of LGBTQ+ culture in the Chinese context.



SPOT - a Service PrOvider-led Trauma-informed intervention toolkit for children from domestic violence and abuse (DVA) backgrounds

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Abstract

Children who suffer physical and emotional abuse show internalising and externalising problems with long-term consequences on mental health. A Service PrOvider-led Trauma-informed intervention (SPOT) based on the trauma recovery model (TRM) was co-created with Living without Abuse (LWA) for use in their services providing support to families emerging from DVA backgrounds. SPOT takes a person-centred approach by identifying and addressing underlying needs based on the TRM stages. SPOT is delivered over 8-12 weeks including child and parent modules. The aim of this pilot study was to assess the effectiveness of SPOT in reducing internalising/externalising difficulties and improving wellbeing in children who have witnessed/experienced DVA. Strength and difficulties (SDQ), emotional wellbeing (YP-CORE), trauma response (CRIES-8) and self-esteem (LSES) were measured in referred children (N=48) before and after completing the intervention. At referral, children showed high levels of SDQ difficulties (specifically emotional problems and impact), and trauma response. Significant associations were observed between internalising and externalising problems, increased intrusions and reduced well-being, with latter also linked to lower self-esteem. Compared to pre-intervention, paired t-tests revealed significant reductions in post-intervention scores across all internalising and externalising SDQ scales, and trauma intrusions (CRIES-8). This suggests that SPOT was effective at reducing pathological trauma response alongside internalising and externalising difficulties in children. Therefore, SPOT could reduce the risk of more severe long-term psychological outcomes in children. We encourage for TRM-based interventions to be translated to wider practices that aim to reduce risks of severe psychological outcomes following abuse.



Effect of Seed Priming and Fortification for Baby Food Formulation in Finger Millet (*Eleusine coracana* L.) Germplasm in Kenya

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Abstract

Food insecurity affects 2.3 billion people globally, impacting 3.1 million Kenyan children under five. Finger millet, (*Eleusine coracana* L.) can fill nutritional gaps and generates income. It is high in calcium (0.38%), fiber (18%), and phenolic compounds (0.3–3%), with anti-diabetic, anti-tumorigenic, atherosclerogenic, antioxidant, and antimicrobial properties. It is also drought-tolerant with few post-harvest pests. However, as a neglected and underutilized crop (NUS), it ranks sixth behind wheat, maize, and rice, with little or no agricultural innovation worldwide. The three research objectives were determining seed priming's effect on germination, nitrogen fertilizer's effect on plant development, and biofortifying protein in traditional baby food. All three studies used *U-15*, *Early Duration*, and *Snapping Green* genotypes at Egerton University in Njoro, Kenya. Study 1 analyzed germination rates using gibberellic acid (GA), 6-benzylaminopurine (BAP), and indole-3-acetic acid (IAA). In study 2, genotypes were grown in PVC tubes with varying nitrogen fertilizer concentrations before harvest and chlorophyll and root structure analysis. Study 3 measured the nutritional composition of baby food containing malted and unmalted pigeon pea (*Cajanus cajan*) and peanut bases (*Arachis hypogaea*). Tests for phosphorous, zinc, calcium, magnesium, iron, and protein were done. Gibberellic acid had the highest rate of germination (90+%). Malting increased calcium and magnesium availability, but no statistically significant increase in protein was observed. Fertilizer study results are pending. In the future, metabolic profiling via HPTLC and HPLC and expanding baby formula protein sources will be done to increase finger millet's nutritional foundation and combat food insecurity in Kenya and worldwide.



Charting the Sea of Translation: A Simple Framework for Synthesising and Evaluating Theory

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Abstract

Though a relatively young discipline, Translation Studies boasts a large and growing body of literature, presenting widely diverse perspectives, methodologies and ideological assumptions. This research aimed to overcome the challenge of synthesising such diverse information by developing a clear, simple and intuitive framework that ‘charts’ the ‘sea of theory’ from an applied perspective, facilitating synthesis, analysis and critical evaluation. Based on the etymology (in three languages) of ‘translation’, three key questions were posed: What is carried over in translation? Where to? Where from? When tested by application to a specific translation project, this skeleton framework was found to function simply and effectively. Answering each question drew together relevant theories for comparison, analysis, then synthesis (if mutually compatible) or contrastive evaluation (if conflicting). However, evaluating theories to implement involves value judgements and required an supplemental ‘compass’ of ideology. This exposed the importance of consciously identifying ideologies and understanding their impact on theory, which can be analysed within the framework, distinguishing possible from ideologically acceptable. This facilitates critical evaluation of controversial issues and identification of how approaches from very different areas and traditions of research interact and could potentially be synthesised in translation practice. Future applications of this ‘chart’ could include structuring future analyses and overviews of translation studies, and contextualising individual theories. It should be transferable to research areas and languages not considered in this investigation, due to its simplicity. For practising translators, the framework can facilitate reflective consideration and application of theory in the context of their work and ideology.



An Analysis of British Trade Cards from the Nineteenth Century

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Abstract

For my History BA dissertation, I am looking at the Bedford Collection of trade cards held by the University of Leeds' Special Collections. I chose to focus on the topic because many people are familiar with modern-day trading cards, such as baseball ones, but not a lot of research has been done on the history of the trade card. Thus, it would be interesting to see and analyse the origins of the trade card.

I am going to look at British trade cards from the nineteenth century. By using a comparative approach, I plan to utilise both qualitative and quantitative methods of analysis to find out how trade cards have changed over time, differences in trade cards across different geographical locations, and did the type of business which they advertised had any significance on how they looked.

The field of study has been severely under-researched and hardly anything has been written about trade cards. As the trade cards were given by business owners to loyal customers, my findings will matter as they will reveal how different types of businesses wanted to portray themselves to their customers. Thus, I aim to contribute not only to the study of trade cards, but also to the wider field of early advertising.

Future research might concentrate on different centuries, which can be compared to my research that focuses on British trade cards from the nineteenth century. Also, other collections of trade cards from different countries can be studied in the future.



'In My Fleabag Era' : Exploring The Rise of Dissociative Feminism

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Abstract

What does the Dissociative Feminist look like to the person unfamiliar with the phrase? Emma Garland for Dazed describes her as: 'prone to showing up in last nights makeup, smoking two cigarettes for breakfast, or experiencing 'the feminine urge' to [sleep with] her sister's boyfriend.' The dissociative feminist is sharing specific memes, reading specific books, and listening to specific music. It is an aesthetic, but also a way of framing life. My research encourages critical thinking of seemingly harmless activities: a creator sharing an image of themselves crying, stating they're in their fleabag era; lists about what hot, crazy feminist book to read next. What do these images mean, and what do they capture about the current nature of contemporary feminism?

Textual analysis of Phoebe Waller-Bridge's *Fleabag* and Ottessa Moshfegh's *My Year of Rest and Relaxation*, alongside these texts appearance in online memes uncovers how the dissociative feminist identity is aesthetically constructed online. Alongside researching these texts, and a review of feminist literature, I find that the dissociative feminist aesthetic and mindset has arisen from a rejection of the liberal feminism of the mid-2010s. Young women in response to this turned to the aesthetics of dissociative feminism to cope, via memes and curated identities. The analysis of my chosen texts, feminist literature and memes makes space for young women to disengage with aesthetics and identity commodification, to question their space within the cultural, and digital, landscape.



Is real-time ray tracing worth the extra computing power in video games?

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Abstract

This paper explores rendering techniques, in particular the use of real time ray tracing in video games. Despite ray tracing being first conceptualised in the late 1960s (Ashworth, 2019), the real-time application in video games is at the forefront of technology (Martindale, 2022). Breakthroughs in hardware are now facilitating real-time ray tracing (Segura 2022), including some triple A titles developing and releasing real-time ray-traced games (Archer & Castle, 2020). The aims and objectives of this paper are to answer the research question; do the aesthetic benefits outweigh the expenditure of any additional computing resources necessary for the application of real-time ray tracing in video games?

The experiment conducted will have participants play two games, identical in gameplay, and only distinguishable in rendering. After an analysis of the results, a conclusion can be drafted; it can then put forward the argument that adding additional hardware upgrades to a gaming platform can improve a player's aesthetic experience.

Predictions in results anticipate that casual players are not going to see much of a difference in the rendering techniques, as they are not going to be looking for the finer details. Whereas conjecture for the more avid gamers will discern performance issues such as drops in Frames per Second (FpS) and game stutter but are predicted to notice the better lighting, shadows, and reflective qualities of the render, leading them to prefer the ray traced game.



Barriers to Accessing Rehabilitation Services After Traumatic Brain Injury (TBI)

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Abstract

Background: TBI can cause significant cognitive, social and physical deficits and therefore appropriate rehabilitation following head injury is included within the National Institute of Clinical Excellence guidelines for head injury, however previous research has indicated that some individuals are unable to access the rehabilitation they require. Identifying the gap between need and access to rehabilitation is thus a crucial first step in minimising the barriers and improving the quality of life of people who have experienced a head injury

Design / methods: Data from 7 people with a TBI was obtained through semi-structured interviews and analysed according to Braun and Clarke's thematic analysis.

Results: Two main themes emerged from the data: (1) Adaption to life post-injury; (2) external factors affecting rehabilitation. The themes and subthemes described the changes and difficulties participants experienced following TBI, and the impact rehabilitation services had on them. Although TBI reshaped every aspect of participants' lives, healthcare professionals were often unhelpful and unknowledgeable of the support individuals with a TBI required. Unsupported, participants were left to research local rehabilitation services and access financial and community support alone.

Conclusion: Participants found a significant gap between their need for rehabilitation and ability to access the services required. Many participants proposed groups to connect them with other people with TBI, to provide support and information regarding all aspects of life post injury. Current expansions of this research are ongoing to include experiences of people with non-traumatic brain injury with the aim to gather more generalisable results.



Behaviour change approaches within digital health technology based interventions in physical stroke rehabilitation: A scoping review

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Abstract

What can be done to improve physical rehabilitation after stroke? Incorporating digital health technology (DHT) into rehabilitation has the potential to positively transform provision and user outcomes in clinical practice. Behaviour change is considered fundamental to effective rehabilitation, as interventions often seek to change behaviours. DHTs provide an opportunity to influence behaviour change but little is understood about the use of behaviour change approaches within DHT-based interventions prompting the need to explore this area of physical stroke rehabilitation.

A scoping review was undertaken to identify, map, and discuss the behaviour change approaches within DHT-based interventions in physical stroke rehabilitation. Utilising the Joanna Briggs Institute guidelines, a systematic search was completed, sources were screened, and data was charted and analysed. As an undergraduate intern, I contributed to screening sources, the development of the data charting tool and data charting. Preliminary findings suggest that behaviour change theories are not routinely considered, however, the most commonly utilised behaviour change techniques have been identified.

Despite recommendations that interventions have theoretical underpinning, this is not consistently reported in studies. These findings suggest that more widespread consideration of behaviour change is needed within DHT-based interventions in stroke rehabilitation to ensure the effectiveness of future interventions implemented in clinical practice.

Analysis of this review is ongoing by the research team. This work forms part of a larger project working towards the production of a framework exploring influences on the success of development and implementation of DHT in rehabilitation.



COVID-19 Mitigation Efforts and Social Health Outcomes in Adolescents Residing in the United States' Deep South

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Abstract

COVID-19 and its mitigation measures (shelter-in-place, social-distancing, suspension of in-school activities) may have had negative consequences on adolescents' social health. Research suggests that COVID-19 led to lowered social activities, particularly among those in racial minorities groups (Black-African American) or with lower socioeconomic status (SES). Existing health research focuses predominately on White or non-United States (US) samples over short time periods. This study investigated the differential impact of COVID-19 on US adolescents' social health (family cohesion, neighborhood safety, commitment to school) as a function of sociodemographic factors (age, race, SES, gender) over 18-months. It was hypothesized that the impact of COVID-19 and its mitigation efforts on social health factors would vary by sociodemographic factors. Drawn from a longitudinal study based in the US's Deep South, 190 adolescents (73% Black-African American, 53% female) self-reported neighborhood safety, family cohesion, and commitment to school. Mixed effects regressions revealed a decrease in family cohesion over the 18-month period. There was marginal evidence the decrease was due to COVID-19, but decrease was not differentially affected by sociodemographic factors. This study diversifies the literature on the impact of COVID-19 and its mitigation measures on adolescents' social health. Further, it is based in the US's Deep South, largely populated by those identifying as Black-African American or of low SES. Both subgroups are underrepresented in US-based health-outcomes research. COVID-19 directly and indirectly impacted adolescents' social health. Further investigation of long-term consequences of COVID-19 and mitigation efforts on adolescent social, mental, and physical health is warranted and planned.



Plant Pollen Grains: A Feasible Application for Bone Regeneration

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Abstract

Traumatic, infectious, and tumoral bone fractures are associated with clinical interventions that require bone transplantation (also known as bone grafts) either from the same patient or a donor. Calcium-phosphate ceramics (CPCs) are clinically viable alternatives to bone grafts: they are non-inflammatory, biocompatible, and promote bone regeneration. However, controlled and cost-efficient methods for synthesising spherical CPCs remain underdeveloped. This study investigates the structural framework of spherical pollen grains as a template to synthesise CPCs. Pollen grains were washed with phosphoric acid and acetone to remove the intrinsic organic material. The washed pollen was then introduced into the wet precipitation reaction to form calcium phosphate and subjected to thermal treatment for removal of the pollen. Electron microscopy revealed the successful synthesis of spherical-CPCs. Findings from infrared spectroscopy demonstrated the presence of phosphate groups. X-ray diffraction patterns also confirmed the synthesis of CPC particles, with enhanced crystallinity post-treatment. Generally, spherical-CPCs are beneficial for proliferating bone cells, relative to other morphologies. However, the growing sale prices of CPCs within the medical industry place a high-cost burden on the NHS. Thus, these findings offer a cost-effective method for the controlled production of spherical-CPCs. Significantly, this research can also be utilised beyond the medical industry: for example, CPCs are used in food industries or agriculture as mineral enrichments or as fertilisers. Therefore, pollen grains as a template to synthesise spherical CPCs are feasible outside medical industries and practicable clinically to alleviate the growing costs associated with bone fractures.



Synthesis of literature on the role of education in precision agriculture technology adoption among farmers

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Abstract

Sustainable farming is becoming increasingly important and precision agriculture (PA) technology provides a solution to sustainability concerns. However, there are concerns about low levels of adoption, therefore we need to understand how farmers make adoption decisions.

There is a wealth of research regarding PA technology adoption amongst farmers and the factors influencing adoption, in particular farmer characteristics such as education. It is generally believed that education has a positive impact on technology adoption. However, it is not clear what type and level of education is necessary to facilitate technology adoption among farmers and the extent to which education interventions are effective in promoting technology adoption across different regions and contexts.

This research synthesizes the literature on the role of education in PA technology adoption among farmers. The findings of this research will provide valuable insights into how education can influence the adoption and effective use of new technologies. These insights can help inform policy and practice aimed at promoting technology adoption as well. They can also be used by Higher Education institutions for curriculum development, pedagogy, research, and partnership with industry stakeholders in promoting technology in PA.



Responses to and Impacts of the Bubonic Plague Outbreak in Newcastle upon Tyne, 1636

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Abstract

During 1636, an outbreak of bubonic plague within Newcastle upon Tyne killed approximately 5000 people, with those afflicted dying quickly and horribly, experiencing high fevers with buboes (swellings) that leaked pus. This research documents the progression of the epidemic among various parishes of Newcastle: St. Nicholas', St Andrew's, Allhallows, and St. John's. In addition, possible factors contributing to the rapid spread of disease, such as the ubiquity of rats and overpopulation are discussed. Prominent features of the outbreak were the implementation of quarantine, how this was done in practice and how it was perceived, which are often overlooked, as most research has concentrated on general impacts. This is done using probate records from citizens during 1636. This research may help to provide insights into managing the COVID-19 epidemic or current outbreaks of plague, within low and middle-income countries such as Madagascar, the DRC and Peru where plague is still endemic.



Potential collusion behaviour and distortionary pricing in the US airline industry post-pandemic.

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Abstract

The COVID-19 pandemic has caused a turbulence in many industries, especially air transport. In the US, as air travel was restricted, many routes have been removed due to insufficient demand. I will attempts to evaluate the effect of this shock on the competition pattern and collusion in the US airline industry.

Collusion is a central them in empirical industrial economics as it leads to distortionary pricing, decreasing consumer welfare. Previously, using different methods of collusion detection, some literatures have suggested that US airlines exhibit collusive behaviour. My paper aims to detect possible collusive behaviour of US airlines after the COVID-19 pandemic using the model suggested by Ciliberto et al. (2019). The model bases on a theory relating multimarket contact (MMC) and the price difference between airlines in each route, where the price difference captures the degree of competition within a market. I attempt to test the correlation between the price difference and the multimarket contact to determine whether collusion arises through this pricing channel.



Variation in Prevalence and Genetic Risk of SLE Across Populations

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Abstract

The prevalence and severity of systemic lupus erythematosus (SLE), a chronic autoimmune disease, have been found to vary across different ancestries. In my work, I have provided an overview of the genetic factors that may contribute to this variance. Large genetic studies suggest that these factors are risk loci which are shared by populations of different ancestries but the individual risk alleles are more common in some, leading to a higher prevalence and severity of the condition. However, some risk loci were found to be ancestry-specific and are hypothesised to have undergone differential selective pressure in recent human history. Additionally, the effectiveness of certain medications used in SLE was found to vary across ancestries, which might affect the disease progression.

To assess the effect of the presumably most significant of the factors for severity and prevalence, an excess load of risk alleles, I replicated the calculation of genetic risk scores (GRS) for each of the major populations in the 1000 Genomes Project data using an expanded list of SLE-associated alleles. My results show that the GRS does not fully correlate with the disease frequency for the major ancestral groups, with individuals of African ancestry showing the highest prevalence of SLE but the lowest GRS. To better understand this discrepancy and the full role of genetics in the risk of SLE, larger studies need to be conducted in diverse populations so that causal alleles, or alleles in high linkage disequilibrium with causal alleles, can be detected in individuals of various ancestries.



Observing Dental Therapists working under direct access: What makes this model effective?

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Abstract

The National Health Service (NHS) Dental Statistics for England (2021) reported 951 general dental practitioners (GDPs) ceased working for the NHS in 2021 alone. Since the Covid-19 pandemic, patients have struggled to access NHS dental care. Therefore GDPs need to be supplemented with other dental care professionals (DCPs) such as Dental Therapists (DTs). The General Dental Council [GDC] (2013) defines direct access (DA) as 'carrying out treatment without a prescription and without need for patients to see a dentist first'. DA was implemented in 2013, but is only seen in private practices because current NHS regulations prevent DTs from opening courses of treatment (CoT) (British Dental Journal [BDJ], 2019).

The aim of this study is to document the model used in DA examinations and investigate its effectiveness. DTs will be observed in a private practice working under DA. Field data will be collected in the form of photos, a checklist and additional notes. The data will then be analysed using Braun & Clarke's thematic analysis (2022) and compared to data from the literature.

The results will highlight which processes are effective and should be repeated in other dental practices, as well as which processes are less effective and need resolving in order to streamline the model. When NHS legislation changes to allow DTs to open CoTs, these results will hopefully offer a baseline DA model that can be used.

Findings from this study will inform DA practices within the Dental Academy, as well as inspiring further research.



Law, Disobedience, and Stationer in Charles I: Michael Sparke, a case study

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Abstract

Stationers in early modern England were interesting participants in unlicensed book publishing. While the Stationers' company has become increasingly active in early 17th century England, the stationers still had a large autonomy in terms of the book-publishing process. They select their preferred authors, make investments in them and have a responsibility to the selling. Stationers during this time tend to show disagreement with the operation of book-publishing ordinances, and this disobedience behaviour was of interest to this study.

Current historiography has already provided a great discussion on press regulation under Charles I; there are also comprehensive studies of the stationers and the Stationers' Companies during this period. This research intends to further explore the complex feature of disobedience among the stationers. It was conducted as a case study of the stationer Michael Sparke working under the reign of Charles I largely based on the record in the Gale Database the Calendar of State Papers. The research intended to show that the active engagement of the stationers in the 1630s might indicate an insisted resistance toward the ordinance among a larger crowd, which carries a strong notion that some prohibited books have a legal base to be published, with an expectation that the legal system will respond and agree to this legal base. This notion exceeded interest in profitability or political power, was far more than a sort of empathy to the authors, and deserves further investigation.



Motivations for being informal carers of people living with dementia: An updated systematic review

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Abstract

Informal caregivers offer vital continuous, unpaid care to improve the quality of life of people with dementia and ease the demand for care services. The dyadic process of caregiving has multifaceted impacts warranting efforts to reduce caregiver burden and improve well-being, understanding motivations for adopting a caregiving role can predict experiences, perceptions, and impacts. A systematic review conducted by Greenwood and Smith found motivators for informal caregivers. Substantial evidence documents variations in cultural perception and social values influencing caregiver experiences and motivations. The purpose of this systematic review was to update the searches by Greenwood and Smith to describe and compare the motivations of caregiving between demographics, ethnicities, and cultures. Six electronic databases were searched from August 2018 to August 2022. Titles and abstracts screened using Machine Learning approaches (ASReview). A subset of full texts was screened in duplicate. Included studies were appraised using the Mixed Methods Appraisal Tool (MMAT). Extracted data were grouped into themes. Initial database searches identified 1,530 articles and the following deduplication and screening 24 shortlisted studies were included. These were added to the existing 26 studies from Greenwood and Smith. Cultural explanations for motivations for caregiving include familism, ethnic identity, cultural values and beliefs, obligation, and sense of fulfillment. Cultural perception and social values influence caregivers' experiences and perceptions thus affecting the family's engagement/acceptance of formal care/support. Further research is warranted to inform advances in psychosocial support interventions for ethnically diverse caregivers to achieve personalised care and reduce the burden on family caregivers.



Facilitating Collaboration: Do Teaming Agreements really work in multi-tiered supply chains?

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Abstract

As projects within the Defence Industry become increasingly complex and competitive, additional skills and knowledge may be required from other specialist organisations to remain competitive (Burnett and Kovacic, 1989, p.254); Teaming Agreements (TAs) are typically put in place to provide assurances of such collaboration (Chierichella, 1988, p.555). But do TAs really support collaboration?

To investigate this question a five-month work-based project is the focus of study, the project facilitating a supplier supporting a customer under a TA. A mixed-method research approach is taken using semi-structured interviews to gather qualitative data and questionnaires and observations for quantitative data. The results of thematic analysis on the qualitative data are triangulated with the descriptive statistics of the quantitative data to produce a complimentary rich picture (Gorard and Taylor, 2004) of collaborative activity.

Whilst this research is currently ongoing, initial findings suggest that whilst collaboration occurs under a TA, aspects of governance imposed under the TA can actually hinder collaboration, especially under time restraints. Should these initial findings be confirmed then it suggests a misalignment between the spirit of the TA, governance and customer requirements. To address this it is suggested that TA related governance processes be revisited in relation to timed-based flexibility possibly through a more pragmatic governance approach surrounding TAs.



Analysis of the Chemical Recycling of PET by Glycolysis.

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Abstract

PET is a common plastic that is highly utilized in drinking bottles. Despite its positive economic use, it is of concern that there is an increase in PET disposed of in landfill with minimal recycling taking place. Mechanical recycling is the major recycling method of PET, but its drawback is the loss of quality of the product that will unlikely be reused after its consumption. However, chemical recycling by glycolysis is a promising recycling route for post-consumed PET where it is broken down with the use of ethylene glycol to form its monomer, bis(2-hydroxyethyl) terephthalate (BHET). The research aims to compare the yield of BHET between the use of triazabicyclodecene (TBD) organocatalyst and zinc acetate catalyst and analyze the effect of the stirring rate with the reaction temperature of 190 °C and reaction time of 30min. The process has shown unique results due to the variation of temperature while using the magnetic stirrer hotplate. While comparing to other experiments from the literature, there is a lower product yield and it is shown that the use of zinc acetate is more efficient compared to the use of TBD. However, the reaction temperature contributes highly to the yield of the monomer. Hence, it is suggested for a more suitable heating method for sufficient temperature distribution and further quantitative analysis to find the absolute yield of BHET by High-Performance Liquid Chromatography instead of the theoretical yield of BHET to give more accurate results.



Confronting X-Ray Predictions from Single and Binary Stellar Winds in the Tarantula Nebula

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Abstract

Several theoretical predictions have been made to explain the X-ray emission of hot luminous stars using Milky Way sources. This project confronts said predictions of the relation between X-ray luminosity and stellar wind properties using sources containing fewer elements heavier than helium in the Large Magellanic Cloud. The Tarantula Nebula was chosen as it is a large star-forming region hosting around a thousand OB and Wolf-Rayet stars and has been a target of deep 2 megasecond Chandra observations. A catalogue of compiled physical, wind, X-ray, and orbital properties is produced using results from surveys such as the Chandra T-ReX survey, the VLT-FLAMES Tarantula Survey and the Tarantula Massive Binary Monitoring. Different established relationships were then tested, distinguishing single and single-lined spectroscopic binary (SB1) sources apart from double-lined (SB2) sources. It is found that most of the relationships tested do not fully hold when applied to stars in the LMC. Single and SB1 sources yielded rough correlations but fell short of the one-to-one relation previously proposed. The X-ray luminosity of SB2 sources calculated using proposed relations yielded luminosities a couple orders of magnitude higher than observed, which may indicate a yet unknown mechanism. On the other hand, the investigation into colliding wind binaries at furthest approach yielded a strong correlation which suggests a correlation between X-ray luminosity and wind properties and an inverse relation with component separation. Further research is needed to do the same work to Galactic sources and deep surveys are still needed for lower metallicity sources.



Investigation of the prevalence of the fungus *Fusarium* and its mycotoxins in date palm fruits and their microbial control

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Abstract

Fungal contamination in food and feed is mainly due to improper handling of harvested goods, or improper storage. The present study aimed to explore the prevalence of the mycotoxigenic *Fusarium* in date palm fruits and the microbial control of *Fusarium* species including, *F. verticillioides*, *F. proliferatum*, *F. graminearum*, using Volatile Organic compounds (VOCs) of a local strain of *B. simplex* BS350-3. Various *Fusarium* species were exposed to *B. simplex* VOCs in dual assay in-vitro. The mycelial growth was inhibited in *F. verticillioides*, *F. proliferatum*, *F. graminearum*, with growth inhibition rates of 20.45 %, 2.93%, 4.20% respectively. Moreover, Gas Chromatography GC-MSMS has revealed the presence of Dimethyl trisulfide, 5-ethyl-2-tetrazaboroline, propanoic acid, BHT-aldehyde, 1-pentadecene, pentatriacontane, dotriacontane, tritetracontane, heptacosane, and eicosane compounds in *B. simplex* BS350-3 VOCs as they have shown anti-fungal activity as a specific molecule among them or had a combined inhibitory effect. Although, in this study mycotoxins prevalence in date palm fruits was analyzed confirming that all samples were contaminated with deoxyvalenol mycotoxin (DON) ($73.5657143 \mu\text{g}/\text{kg} \pm 38.6829841$, mean \pm SD), while only 3 samples were contaminated with Fumonisin (FUM) ($0.032 \mu\text{g}/\text{kg} \pm 0.00621825$, mean \pm SD), however, none of the samples was detected to be contaminated with Zearelanon (ZEA).



Reproducibility of a HER2 testing algorithm specific for p53-abnormal endometrial cancers.

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Abstract

Human Epidermal Growth Factor Receptor 2 (HER2) is a gene involved in the normal growth of cells. This gene creates a protein which is only found on the surface of certain cells in breast, gastrointestinal, urinary and reproductive organs. In particular cancers; most commonly breast cancer, surplus copies of the HER2 gene are created stemming from a mutation in the gene itself. Excess HER2 protein is made due to this mutation and this in turn causes cells to divide and grow rapidly. The need to understand which mutated genes are involved with the cancer for a particular patient is necessary in making treatment options viable. HER2 targeting breast cancer treatments can be extremely effective for patients and positively improve prognosis. HER2 positivity can be expressed in all histo-types of EC, including clear cell, serous and endometrioid. This study covers some examples of all 3 subtypes;

however, they all share the characteristic of being p53-abnormal. P53, being a tumour suppressing transcriptional factor, means that it is the most frequently mutated gene in a lot of cancers, EC being no exception. Over 70% of HER2 positive subtypes are shown to have mutations in the p53 gene. Secondary testing will be completed using either Fluorescent In-Situ Hybridization (FISH) or Dual In-Situ Hybridization (DISH). The aim of this study is to create a reproducible test that can accurately score and evaluate HER2 status in p53-abnormal ECs. This will be performed using Leica Bond equipment in a stringent method that will be explained below.



Understanding Perceptions and Experiences Among Teaching Staff of Autistic Girls in Education

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Abstract

Autism is commonly misconceived as a predominantly male condition. Recent data depicts diagnosis to be more common in males than females, although this has significantly narrowed over the last few years. This gendered difference in the prevalence of Autism has led to a gender bias in the research. Autistic girls are often misdiagnosed/diagnosed later than boys, meaning the support they may need is delayed, which can significantly hinder their educational experiences. To begin addressing these gaps an online survey was created to assess teacher perceptions of Autistic girls. I developed a search strategy to find all of the available literature, in order to create a literature review. I assisted in the analysis of the responses, compiling this into a draft summary report of initial findings. The data concluded that the majority of teachers felt Autism presented differently in girls, and girls were more likely to mask their autistic traits, leading to later diagnosis. The data gathered on gendered differences in the presentation could be extremely influential in attempting to create diagnostic criteria applicable to all autistic people. The findings have already been presented at several conferences around the country. A more in-depth analysis of the responses is set to take place which will be used to inform a more detailed report and publications. It is hoped the findings will be used to influence school practises and improve staff training, ultimately improving Autistic girls' educational experiences. Inspired by the research my final-year dissertation investigated the right to inclusive education.



Effects of Combining Vitamin E and Bcr-Abl Inhibitors on Chronic Myeloid Leukaemia Cells

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Abstract

Chronic myeloid leukaemia (CML) is a blood cancer that expresses cancer-causing Bcr-Abl protein. Imatinib and GNF-5 are Bcr-Abl inhibitors, with the former being the first-line treatment for CML while the latter is currently under preclinical evaluation. Annatto tocotrienol (AnTT) consists of natural forms of Vitamin E such as delta- and gamma-tocotrienols that are extracted from annatto seed. These forms of Vitamin E have been reported with anti-cancer properties but not their anti-leukaemic properties. Therefore, investigating the effects of combining natural forms of Vitamin E with Bcr-Abl inhibitors may offer novel insights in CML treatment. This study aimed to determine the anti-leukaemic effects of AnTT on human CML cells, with or without the combination of Bcr-Abl inhibitors. CML cells were treated with imatinib (0-100 μM) or GNF-5 (0-100 μM) to assess their effects on cell survival. Subsequently, cell survival upon AnTT treatment (0-50 $\mu\text{g}/\text{mL}$), with or without the combination of imatinib or GNF-5 were determined. Current findings demonstrated that imatinib, GNF-5 and AnTT treatment alone reduced the survival of CML cells, with half-maximal inhibitory concentration (IC_{50}) values of 40 μM , 50 μM and 37 $\mu\text{g}/\text{mL}$, respectively. Nevertheless, the combinational effects of Bcr-Abl inhibitors with AnTT were antagonistic, where IC_{50} values from combination treatments remained similar or slightly lower. In conclusion, although the mechanism of antagonism remains unclear, current findings suggest that supplementation or diet rich in specific Vitamin E forms (delta- and gamma-tocotrienols) might not be suitable for CML patients receiving Bcr-Abl inhibition therapy.



Room Temperature Phospha-Brook Rearrangement of α -Hydroxyphosphonates to Phosphates.

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Abstract

Malaria is a deadly disease that is present in over 109 countries. In 2020 there were an estimated 241 million cases. Organophosphates can be employed in medicinal field to find new ways to fight malaria. The aim of the project was to find a new, more efficient way to make organophosphates.

Organophosphates are a class of compound that have been studied extensively as they play important roles in many physiological processes such as energy transfer and photosynthesis. The aim of this project was to find a way to synthesise this class of compounds with less resources and with higher yields employing different methods from the ones used so far. Our team was able to find a way to synthesise these compounds at room temperature, a protocol which had not been employed before.

The Pudovik reaction was employed to prepare several α -hydroxyphosphonates. Following, a series of substituted phosphate esters were synthesised via a phospha-Brook rearrangement of the α -hydroxyphosphonates. DBN (1,5 diazabicyclo(4.3.0)non-5-ene) was employed to facilitate the rearrangement for the first time at room temperature. The conditions for this rearrangement were optimised to obtain the highest yields; a plausible mechanism for the rearrangement has been proposed to take place via an organophosphirane intermediate that has been observed for the first time by low temperature ^{31}P -NMR.

Opportunities arising from this research are exciting and could mean changes in the way drugs could be prepared, ranging from mass production to a more cost-effective synthesis to be employed in medicinal field.



The crystallization mechanisms of honey

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Abstract

Honey has been present in human civilization for thousands of years. In spite of such a long history, little is known about how this substance becomes solid, there is disagreement on the crystallisation mechanisms and when they are manifested. My research has focused on the study of phase changes through the change of viscosity, supersaturation, heterogeneous nucleation sites, temperature and mass transfer catalysis through the use of bubbles. I have studied 11 types of honey from different parts of the world (Mexico, Chile, Oman and the UK) to test for different compositions of honeys from vastly different flora. My methodology included observing honey crystals through a polarised light microscope in a temperature range between -10 to +40C. I introduced bubbles to the solution and measured the change in crystallisation rate at 5C. Lastly, I tested different honeys for their viscosity at different temperatures using a rheometer. The results indicated that the crystallisation of honey is a product of multiple mechanisms that are present at different temperatures indicating that a change in temperature through day and night cycles may increase the rate of crystallisation. Homogeneous crystallisation was found to be dominant at high viscosities and lower temperatures while heterogeneous nucleation on pollen was the dominant mechanism at higher temperatures and low viscosity. Rheology results strongly indicate a glass transition temperature above freezing dependent on super saturation. Bubbles increased the rate of crystallisation through the proposed mechanism molecular surfing, a proposed mechanism that may help change the phase of honey in industry.



How Barriers of Entry are Lowering Within The Games Industry

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Abstract

In 2021 there were 11,744 games published to Steam alone (Video Game Insights, 2022), with approximately 32 games being released per day, the video game market is becoming increasingly densely populated. This study will explore the tools, technologies, and platforms involved in designing, developing, and publishing an “independent” video game, and specifically analyse the changes in the barriers of entry to their usage. Concluding with an analysis into what these findings represent for the future of the video game industry.

The study will question several game development professionals and hobbyists into their experience with the tools of the industry and will involve a first-hand autoethnographically documented experiment wherein the researcher will attempt to develop and publish a small game under strictly budgeted time, resources and funds.

The data produced will then be critically evaluated to establish trends and future predictions for how the tools documented may continue to become easier to use, and potentially become more powerful with time. These findings will then be used to the explore potential impacts on the game industry should these established trends continue.

Expected findings of the study will outline how the lowering of skill, monetary and time barriers involved in game development are being utilised by developers to produce high quality games whilst still maintaining financial, creative, and publishing independence. It is in turn expected that this will be found to be the cause of the vigorous increase in the number of video games published in recent years and as time continues.



Activity levels of captive Humboldt penguins: a comparison of the efficacy of environmental enrichment methods.

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Abstract

Environmental enrichment is of increasing importance to zoos and captive wildlife organisations. Enrichment must be species-specific, encouraging behaviours that are possible in the confines of an enclosure and that would occur naturally in-situ. Many studies have researched the impact of pododermatitis (bumblefoot) that a sedentary lifestyle can induce in captive penguins; however, not many have expressed an interest in characterising which enrichment methods appear to be 'preferred' by the penguins. 'Preferred' refers to which methods increase levels of activity through direct or indirect interaction. This study focused on the 12 Humboldt penguins *Spheniscus humboldti* at Bournemouth Oceanarium, with the aim of identifying preferred methods of enrichment to increase levels of activity and decrease time spent in a sedentary state, as to reduce the chances of onset pododermatitis. There was a 4-week observation period with an enrichment change each week, resulting in 5 observation days for each enrichment type. Additionally, the weather and number of visitors were observed each day to understand if this had any influence on the levels of activity and interaction from individual penguins. Mirror enrichment provided the highest levels of activity and was the 'preferred' method of enrichment across the colony and significant differences in activity and interaction ($p < 0.05$) were recorded for 3 of the 4 enrichment types compared to no enrichment levels. This showed that it's important to understand the efficacy of different enrichment methods. Future studies could explore whether this outcome is reliably repeated for other individuals to aid in enrichment suggestions for wildlife organisations.



A Study of the Applications of Metal 3D Printing in the Aerospace Industry

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Abstract

Current manufacturing of jet engines requires a multitude of individual parts, which makes manufacturing time consuming and demands copious amounts of labour. This research focuses on increasing the efficiency of the manufacturing process. With 3D printing the number of engine parts can be significantly reduced by manufacturing individual components together.

This research will concentrate on which geometries make the part most suitable for printing to maintain the best properties. The selected design is then printed, evaluated, and improved until the best outcome is reached.

This study investigates two components that were previously manufactured separately and prints them together. By doing this the time to assemble the engine, cost and labour is reduced. Using this technique, weight is also reduced, improving engine efficiency.

So far it has been found that increasing certain dimensions and removing overhanging sections improves the parts ability to be printed. The printing parameters can also be improved by changing the temperature used to print the part, the speed at which it is printed and the lattice structure inside the component.

Moving forward, the part would be tested in a simulation set up to mimic its use. This will provide data that can be used to improve efficiency within the assembly. Once the data is analysed a variety of iterations will be created and tested until the best possible outcome is reached. Once complete the application of this study could increase efficiency within the aerospace industry while simultaneously decreasing cost and manufacturing time.



Modernising the Past: Impacts of digitisation on the accessibility of historical materials for local communities

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Abstract

This project discusses ‘What impact has the digitisation of archival material had on the accessibility of history for local communities?’ The use of digital technologies to access historical materials is of debate, due to a perceived threat to traditional methods and the authority of the historian. However, digitisation improves the accessibility of history for all by removing the ‘academic elitism’ surrounding archives, and increases community engagement with history.

I used surveys to assess the impacts of putting historical materials online, determining how local attitudes towards the past changed as a result, and explored why digitisation projects should receive greater funding. I focused specifically on the oral histories and photographs of two institutions local to me, the National Railway Museum and the University of York, and found that over 60% were unaware of the free online access to archives.

Digitised material was found to positively impact a community’s knowledge of their history, but the limited public awareness of this access prevented its use. Archives contain knowledge that is beneficial for all of society, academics and public alike, and the preservation and promotion of our national heritage should receive more appropriate support.

Greater funding therefore needs to be allocated to the public history sector. This access needs to receive greater marketing to increase community awareness, and subsequently engagement with our national heritage. More digitisation projects also need to occur worldwide, and I will be assessing the impacts in Luxembourg throughout Summer 2023, testing whether these conclusions hold on an international level.



Xion-C: a software to facilitate the identification of the conjugation sites of conjugate vaccines by LC-MS/MS analysis

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Abstract

Mass spectrometry is a key analytical tool in protein characterization and proteomics. The identification of conjugation sites in conjugate vaccines is requested by regulatory authorities. This quality attribute can be determined by LC-MS/MS analysis and the identification of type 2 peptides using the software developed in functional proteomics software (pLink2, Kojak and StavroX) to study protein-protein interactions. The software Xion-C has been developed to: (1) increase reliability in assigning linear peptides and type 2 peptide conjugation sites; and (2) obtain a fingerprint of the synthesized conjugate. To achieve these two goals, Xion-C parses the raw data file formats of LC-MS/MS runs as well as the output files of the identification software and extracted from total ion current chromatogram the extracted ion chromatograms (XICs). In more than 85% of the cases the XICs profile was useful to support unequivocally the assignments of ion signals to linear or type 2 peptides. In addition, the software overlaps independently all XICs assigned to linear and type 2 peptides to obtain two profiles of the conjugate that can be used to evaluate the reproducibility of the synthesis. Xion-C runs from a common PC with a Windows OS and is compatible with the Isotopica web application, to calculate the ¹⁸O-content of linear and type 2 peptides as another validation tool. The software simplifies considerably the analysis of complex molecules such as the case of conjugate vaccines and alleviate the manual validation processes to be performed by the specialists.



Supporting Novice Python Programmers' Debugging

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Abstract

This research project aims to investigate the emotional responses and problem-solving strategies of novice Python programmers (NPPs) when encountering standard error messages. By working with MyCodeKit, the research presents insights into how OcoBox, a chatbot-based tool, can deliver error messages in a way that promotes resilience and problem-solving skills in NPPs. The primary objectives of the research are to:

- Understand the emotional responses of NPPs when they encounter standard error messages
- Analyse the steps NPPs take to fix errors based on standard error messages to identify the optimal approach for supporting NPPs in recovering from errors.

The results of the research indicate that NPPs experience more negative than positive emotions when encountering unexpected error messages. English level and Python skill level do not seem to affect understanding of the error messages above a certain level such as intermediate (Python skill level) and full professional proficiency (English level). NPPs mostly rely on seeking help from teachers/classmates, searching online, and trial-and-error to resolve errors. NPPs were satisfied with using OcoBox, but instructors preferred students to find solutions independently rather than relying on the tool. The research shows that NPPs have emotional responses to error messages and have specific behaviour patterns when facing them, however, more research is needed to understand this topic in more detail.



Analyzing the Ability of *Astragalus tennesseensis* to Accumulate Selenium

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Abstract

Selenium is an essential micronutrient that is naturally occurring in many soils, and can be accumulated by some plants. When accumulated in high amounts, the plant is called a selenium hyperaccumulator. *Astragalus bisulcatus* is one of the most well-studied hyperaccumulators. *Astragalus tennesseensis* is a related species, which currently has no literature investigating its ability to accumulate selenium. This project will investigate whether *A. tennesseensis* can accumulate selenium. Both species were grown in a greenhouse to compare their reactions to the presence of selenium. Sodium selenate (Na_2SeO_4) will be used for test groups. After treatment is completed, the plants will be digested in nitric acid and analyzed by atomic absorption spectrophotometry to determine the selenium content. *A. bisulcatus* is expected to thrive in the presence of selenium. Because there is no literature on *A. tennesseensis* and selenium, I cannot predict whether it will accumulate selenium. However, the environment *A. tennesseensis* typically grows in has relatively little selenium, so it is reasonable to assume that it will not be as efficient as *A. bisulcatus* and may not reach the threshold to be a hyperaccumulator. There are several ways to move forward from this project. A researcher can observe whether selenium is accumulated differently in the various plant parts. Another question is how the plant incorporates selenium into its tissues; selenium often replaces sulfur in amino acids and may be stored in several different forms.



#ShutdownLockdown:A mixed method investigation of decreasing tendencies to comply with lockdown restrictions in the UK

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Abstract

In light of the COVID-19 pandemic, whether or not compliance towards UK lockdowns waned, and if so for what reasons, is of burgeoning importance to shaping public health policy for future health crises. This research reveals that people's willingness to comply with the UK's COVID-19 lockdown restrictions decreased as the pandemic progressed due to their attitudes toward government, their personality traits, and psychological factors. These indicators were analysed through two methods which utilised a mixed approach of 1) applying sentiment analysis to tweets followed by 2) analysing a secondary dataset on compliance and non-compliance throughout the first lockdown. The results indicated that the underlying reasons for a gradual decline in compliance can be summarised under two themes; institutional factors and psychological factors. We, therefore, concluded that worsening mental health and distrust in the government can translate into less compliance. Additionally, certain personality traits were of another decisive factor in regard to compliance with traits such as extraversion affecting one's propensity for non-compliance. Increasing non-compliance is also found to simultaneously occur alongside rising negative sentiment in tweets towards lockdown restrictions across the duration of the pandemic. This conclusively portrays that non-compliance steadily increased over time because of people's declining mental health and negative attitudes toward the government. These findings complement existing research where a comparative analysis of compliance between lockdowns, emphasises focus on how compliance can be better ensured by maintaining public trust in government, leading to better-protected societies in the face of future public health crises.



How Story Can Focus a Player's Experience To Complete Quests

Jonathan Hamilton

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Abstract

This study aims to evaluate how narrative in games can incentivise a player's experience to complete quests. Griffin (2020) points out that side quests "are not just portals to smaller adventures, they are demonstrations of kindness", implying that the characters in the game world do the menial tasks of finding an elderly woman's favourite frying pan out of the kindness of their own hearts, while players are rewarded with gratification. Furthermore, as the world's mini stories are dragged away from the overarching main plot, players may be incentivised to complete these quests to lead to a better or worse world.

The research that will be performed will have participants enter a game with a main narrative followed by a few smaller narratives in the form of side quests that will be made evident through cues. Participants will be split into three groups that all play the game with diverse ways of telling the story. The first group would play with no audio or visual cues, the second group would play with only audio cues turned on and the third group would play with both audio cues and visual cues.

From this, expected results would show how narrative in quests can incentivise a player's experience to complete them and that even without audio and visual cues, players would more than likely be incentivised to complete them through their own choice in wanting a better world. This would also show how player understand a story without cues.



To Scan or Not to Scan

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Abstract

Background: Cauda equina syndrome (CES) is caused by compression of the nerve roots forming the cauda equina (the tail end of the spinal cord). CES produces a characteristic set of clinical features and is a surgical emergency requiring urgent intervention to prevent permanent neurological deficits

Objectives: To assess which symptoms and signs are predictive of CES in adults with lower back pain and which should necessitate emergency investigation with MRI to rule out CES.

Methods: Four databases were searched (Medline, Embase, Cinahl and Amed) using keywords such as 'cauda equina syndrome' and 'signs'. Inclusion criteria included adults over 18 years old and studies published from 2020 to present (due to a high-quality systematic review in 2020 with no conclusive finding).

Results: Ten papers were identified, but only five were relevant. Papers explored symptoms and signs such as bilateral leg pain, loss of sensation and reduced reflexes. However, there is limited evidence surrounding which of these symptoms and signs are predictive of acute CES. However, there was some evidence to suggest that digital rectal exams are not an effective prognostic tool in the assessment of an adult with suspected CES due to their low diagnostic accuracy and false reassurance. However, due to low-quality evidence, subjective documentation and variable clinical assessments, there were no key predictive signs or symptoms.

Conclusion: The objective has not been adequately achieved due to the lack of evidence surrounding this topic and therefore further research is required.



Green chemistry in undergraduate practical classes: how can experiments be adapted to reduce their environmental impact?

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Abstract

Global warming and its associated environmental consequences are among the most pressing concerns of the twenty-first century. The principles of green chemistry¹ seeks to redefine the subject of chemistry, such that it conscientiously addresses its own implications in environmental and human health, whilst contributing to the sustainable modernisation of chemistry. The undergraduate classroom is underutilised. This study aims to explicitly introduce the concept of green chemistry to an undergraduate class by developing a framework to assess the environmental impact of current undergraduate laboratory experiments. The generation of materials such as educational infographics and an excel-based computational metric, quantifying how 'green' an experiment is, is shown to facilitate the development of an effective and sustainable Knoevenagel reaction. Incorporating green chemistry into undergraduate education is shown to serve as a moral framework for students. Increasing their ability to describe green chemistry and puts into context the relevance of novel strategies for solving chemical problems. By providing tools that exposes students to the principles of green chemistry, this study practically contributes to a better knowledge of how the curriculum can be developed to positively influence the next generation of chemists.



Representation of a cultural group through character design for animation

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Abstract

This project aims to redesign the "Indian chief" character of the Disney Film "Peter pan", avoiding the projection of cultural appropriation in the design.

Through researching different representations of Native American people in films and media, such as Native American History and culture, I identified the misrepresentation elements in the original design to avoid them in my redesign. While developing the character, I explored and experimented with design methods such as shape language, colours and their meanings. In addition, I used many elements from Native American artworks, such as symbols, which I applied in my design. My final artefact in the poster depicts and presents multiple and diverse sides of Native American culture that I researched and studied carefully.

My research findings are significant because the method of designing characters as racial caricatures is outdated. Furthermore, these characters can negatively reinforce social issues such as racism and discrimination. Therefore, using well-respected characters to appeal to a global audience is crucial.

As a result of conducting this research, I am sharing in BCUR some methods I discovered that respectfully design characters that can encourage artists to design respectful representations, not caricatures.

In future, I plan to develop this research further by gathering first-hand research data, such as reviews from the represented group and data from Native American museums. Moreover, my research can be used as a reference to explore how inclusive character design can appeal to a broader audience through more sympathetic animation design.

Keywords: Representation, culture, character, design, animation



A Systematic Review of Postoperative Respiratory Complications in Obese Patients.

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Abstract

As a result of the increasing prevalence of obesity globally, healthcare professionals should expect to care for an increasing number of obese patients and should be prepared to provide optimal care and management for these patients. The aims of this study were to assess the incidence of postoperative respiratory complications in obese vs non-obese patients and establish the different types of respiratory complications that occur. PubMed, EMBASE, CINAHL, Web of Science and Medline were searched systematically for studies reporting on postoperative respiratory complications in obese patients. Studies were selected for inclusion using predetermined criteria and screened by two independent reviewers. Study characteristics, incidence and types of respiratory complications were extracted from each included study. Studies were then critically appraised and extracted data was then collated for use in this review. The search yielded 1,753 studies, of which 13 studies published between January 1990-October 2022, were selected for critical appraisal. There were a total of 19 different documented postoperative respiratory complications. Pneumonia and atelectasis were the most common postoperative respiratory complications. Overall, there was a greater incidence of postoperative respiratory complications in obese vs non-obese patients. In conclusion, the literature reviewed in this study demonstrated a higher incidence of postoperative respiratory complications in obese patients, compared to non-obese patients. However, there was very limited evidence where direct comparisons were made between obese and non-obese patients, and very few studies displayed significant results. Therefore, further research is required in this field to fully establish the extent of risks in obese patients



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The Expression of the Antimicrobial Protein RLK-SMP24 in *Nicotiana benthamiana* and its Localisation to the Plasma Membrane to Prevent Tomato Blight.

Daniel Jackson

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Abstract

Phytophthora infestans is a plant pathogen responsible for tomato blight and the 1845-1849 Irish potato famine. Existing protection is prone to resistance and the heavy use of pesticides, a common alternative, is damaging to the environment. Snake and scorpion venom Antimicrobial Peptides (AMPs) are a novel treatment known to avoid resistance and can be produced in non-edible plant tissue. My project aims to produce the AMP in tobacco plants as a model system to fight blight. Cloning was used to fuse a fluorescent tag protein sequence to an AMP and to express the AMP in *Nicotiana benthamiana*. Laser confocal microscopy was used to check that the AMP was being expressed, that the expression was targeted to the plasma membrane only, and to assess the effect of the AMP on plant health. The AMP was expressed and localised without affecting plant growth. This shows that the AMP is not toxic to the plant and this can be applied to future research into AMPs and their effect on other plant pathogens, to express AMPs in other plants or as an alternative to currently used pesticides. This research is relevant to the agricultural industry and is applicable in a practical manner because it provides a new avenue for crop protection that is environmentally friendly. The next step is to test the stability of antimicrobial peptide expression, whether this expression changes across generations, and to test *N. benthamiana* with the antimicrobial peptide against *P. infestans* to see if it prevents infection.



Cream Formulations to Enhance Dermal Bacterial Resistance Using Dead Sea Mineral Mud

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Abstract

Infections that stay within the superficial tissue of the skin can cause delayed healing, exudation, or malodor. Wound infections, particularly those in immunocompromised hosts, can cause systematic infections within the deeper tissues. Therefore, topical antimicrobial agents, such as creams, can be used for superficial pyodermas, skin diseases that include pus, minor cuts, abrasions, burns, and surgical wounds. While the pH of the stratum corneum, the outermost layer of the epidermis, allows for a balanced homeostatic and protection against infections, maintaining this pH is an under-recognized topic by cosmetic brands, proven by the scarcity of low pH cleansers and moisturizers commercially available. Currently, a naturally abundant material gaining media attention is mineral mud, specifically from the Dead Sea. Thought to be derived from older red-brown soils that are swept into the sea during winters, the minerals and other organic materials from the Dead Sea have been proven to decrease skin diseases and chronic pain, especially in patients with psoriasis. This research project focuses on using Dead Sea mineral mud, in conjunction with other natural materials, such as bentonite clay and honey, to formulate a skin cream designed to protect skin abrasions against infections and promote healing. Testing is currently being conducted to ensure each formulation maintains a proper pH level, is UV-resistant, and is resistant against *S. aureus* and *E. coli*, two prominent bacterial strains.



Determination of nutrient and anti-nutrient factors in cassava laves of selected varieties in Kenya.

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Abstract

Food insecurity has significantly increased due to climate change. With corn being the staple food in Kenya, cassava (*Manihot esculenta*, family (*Euphorbiaceae*)), has the potential to provide an additional source of nutrition. Cassava leaves are good sources of vitamins, protein, iron, and other micronutrients. However, it is underutilized in Kenya due to highly poisonous constituents found in the leaves. The objective of this study was therefore to analyze the nutritional and anti-nutritional content of cassava leaves from five varieties (*AdhiamboLera*, *Wild cassava 3*, *Wild cassava 1*, *KME-4*, and *Selele*) in Kenya. We hypothesize that there is no significant difference in protein, fiber, cyanide, and phytate content from vegetable leaves of the five varieties of cassava. Fresh vegetable grade, 7 months old cassava leaves were collected from Migori County, Kenya. Protein content was determined using the Latimer method and fiber content using AOAC method. Anti-nutritive factors of cyanide content was determined using the alkaline titration method and phytate content using the Makkar method. Results indicated that fresh leaf protein content was high in all five varieties of cassava. Fiber content varied among the varieties with *AdhiamboLera* posting the highest content at 22%. All the variety results showed a high cyanide level above the WHO tolerable level (10 mg/100g), with *Wild cassava 1* having the highest level at 31 mg/100g. Phytate content was generally low except in *Wild cassava 1*, which registered a high level at 1500 mg/100g. Future studies will focus on proper processing and detoxification of cyanide for safer vegetables.



Neonatal brain imaging using Ultrahigh Field to measure MR relaxation times T1 and T2

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Abstract

Magnetic Resonance Imaging (MRI) offers a highly-sensitive way to image biological tissues. The recent adoption of ultrahigh magnetic field strength scanners allows images with unprecedented detail. This is particularly beneficial for studying small structures such as those in neonates' brains. This project uses the 7 Tesla (7T) Siemens MAGNETOM Terra at St. Thomas Hospital, London. Induced tissue magnetisation decays with T1 and T2 relaxation times, which are properties of the biological tissues and are used to obtain anatomical maps with different contrasts. Relaxation times vary strongly across ages as brain tissue water content changes with development and depend on field strength. This project is the first to address T1 and T2 mapping on neonatal data acquired at 7T, as these systems have limited use. Neonates were scanned during natural sleep after breastfeeding, positioned head-first supine, and vital signs were monitored by clinical staff. Single slices were acquired for T1 and T2 mapping, using single-shot Turbo Spin Echo with adiabatic inversion recovery and multi-shot Spin Echo, respectively. In both cases, non-linear unconstrained fitting was performed using MATLAB (TheMathworks) function `fmincon`. Median T1 times for one subject are 3180, 2420, and 2720 ms in periventricular frontal white matter, deep grey matter and cortex, respectively; median T2 times are 186, 116, and 141 ms. We observed a clear age-relaxation times dependence in all tissues. The knowledge of these relaxation times will help us optimise image acquisition protocol, establish normal ranges and hence identify subtle pathologies, as extreme variation might relate to pathologic changes.



The Development and Implementation of an application programming interface (API) within Vodafone, evaluating the best practices and processes involved.

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Abstract

APIs have become an essential tool for businesses in today's digital age (Maiya, 2017), as they facilitate communication and data exchange between different systems and platforms. Vodafone has recognised the importance of APIs and is actively monetising and integrating them into their business operations. However, the success of an API depends on a variety of factors, including the quality of the code and the effectiveness of the development process. In response to the growing significance of APIs in Vodafone's operations, this dissertation aims to develop and implement an API with its own functionality using the company's current practises and processes, evaluating the effectiveness of various software and coding standards followed by Vodafone.

The methodology for this study will employ benchmarking as the main methods to measure and compare the API's performance against other APIs and predefined industry standards, as well as to ensure that the code adheres to best practices. The study's findings are expected to highlight areas for improvement in Vodafone's API development process, and recommendations for changes that could increase the effectiveness and efficiency of future projects will be made. These suggestions have the potential to advance the field of API development while also improving the user experience for Vodafone customers. Furthermore, future research could be conducted to investigate the impact of these changes on the success of future API projects, as well as to investigate other processes within the implementation structure to improve the productivity of Vodafone's API development efforts.



An in silico search for low-carbon novel fuels

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Abstract

The harmful impact of greenhouse gas emissions is well understood, with carbon dioxide specifically a major contributor to global warming and its associated climate hazards. Despite this, global CO₂ emissions continue to increase, with the transport sector the second largest contributor at just under 25% of all emissions in 2018.

Decarbonising transport is a particular challenge because the energy density of a lithium battery is approximately 2% of that of a liquid hydrocarbon; the size of battery required to power large vehicles makes electrification non-viable.

To this end, we designed a series of novel high-energy molecules, all based on a three-dimensional framework of nitrogen that we term the “lantern” structure, which have combustion reactions appropriate for internal combustion engines. The properties of these molecules were computed, including the energy changes involved in their combustion, using DFT and G3MP2 methods in the GAMESS calculation engine.

We found that the more hydrogen on the lantern, the more energy it released upon combustion. In comparison to octane, our reference for petrol and diesel fuels, the most hydrogenated lantern released a third of the energy. This gives it a relative energy density of approximately 33%; a much more viable scale. Most importantly, when three equivalents of lantern are burned to produce equivalent energy to octane, up to 41% less CO₂ is released.

However, the lanterns are yet to be synthesised, and more research is required to devise and test a synthetic route. This work provides a theoretical backing to justify such a search.



Conservation Efforts May Be Contributing to Overall Human Health

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Abstract

Epidemiological studies into populations with extreme longevity have enabled the growth of knowledge regarding the blue zones. Blue Zones are areas of non-random clusters of centenarians. From the research conducted several contributing factors for extreme longevity have been highlighted including: geographical, biological, lifestyle, diet, economics, and cultural practices. Research points to the importance of a rich diversity within the gut microbiota and its effects on overall health of humans. One of the contributing factors to longevity within these specific parts of the world is the trace elements found within their water and soil, which may be improving the diversity of the gut microbiome within their gut microbiota. This improved gut microbiome may be contributing directly to longevity. There is a wealth of evidence suggesting that the ecological environment surrounding the blue zones has a positive effect on longevity. This poses the question: could soil biodiversity contribute to overall human health? And could conservation efforts aimed at soil biodiversity also contribute? This paper will primarily focus on reviewing the current literature to understand the potential relationship between conservation efforts and overall human health and even longevity.



Sustainable Tourism & Destination Management – Creating a Sustainable Marketing Campaign utilising VR Technologies.

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Abstract

Media coverage in recent years has highlighted environmental concerns with tourism behaviours and the possible consequences to future generations. Underlining this is that statement that local communities, governmental agencies, NGOs, and tourism industry are now required to work together to maintain cultural, environmental, economic, and aesthetic integrity of their country, region, or town (GTSC, 2016). While the term ‘sustainable development’ dates back to 1972 and the United Nations stressing stress responsible actions in development projects, tourists are becoming more demanding from their experiences visiting destinations, expecting them to meet their own needs. To improve this experience, recent developments in digital technologies have potential to impact positively on tourist behaviours and creating sustainable tourism experiences.

The research undertaken uses the Oculus 360 virtual reality headset and its use in creating sustainable marketing activities. The destination of Coventry, which was the City of Culture in 2021, provided the opportunity to analyse the role of digital technologies in promoting, preserving, and educating tourists about their impacts. The research uses the Cooper’s (2016) three pillars of sustainability in collaboration with the digital technologies and primary research group activities. Qualitative data was gathered through experiences and recorded on 360-degree digital cameras of the city pre and its events. The recommendations formed from the findings show potential in educating visitors about sustainable tourism behaviours, increase revenues for destinations through multiplier effects and reduce the irritation effect tourism brings to host communities.



Medical & Hydrotherapy Spa Design

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Abstract

Drip Medical & Hydrotherapy Spa is a luxury resort destination designed to immerse its guests in the restorative properties of water and communion with nature. This facility will serve the rehabilitative needs of Olympic athletes during the 2030 Winter Games in Vancouver and offer an array of treatments to aid in mental and physical recovery. This topic explores an array of possibilities regarding healing environments, and the various modalities that facilitate health and wellness. This can be done using water as an experiential design element, and juxtaposing wet and dry conditions throughout the facility, as well as emphasizing a continuous conversation with nature. Simple materials serve as a blank canvas for this experience and emphasize the noteworthy details of this design, which are superior climate control through cross-ventilation & radiant flooring, serenity through an interaction with nature, sustainable material selections, and the opposing elements of wet vs. dry, hot vs. cold, and dark vs. light. These combined elements create a dynamic experience that enlivens the senses and compels the mind toward a sense of balance and equanimity. Given the unique qualities of a curated environment, the user is sure to depart with a level of ease and rejuvenation they perhaps were not expecting.



Can we save the Mekong Delta? Modelling the extent to which reductions in groundwater extraction will limit the future submergence of the Mekong River Delta, Vietnam, by 2100.

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Abstract

Despite being home to 17-million people and vital to southeast Asian food supplies, the Mekong Delta, Vietnam, is in peril. 50% of the delta's shoreline is currently eroding due to rising sea levels and reduced upstream sediment delivery. Almost 30% of the delta could be submerged by 2100. Groundwater extraction, where water underneath the ground is (often illegally) extracted for irrigation, was identified in the Mekong Delta Plan (2013) as a significant delta sustainability threat. However, no previous research has quantified the extent to which groundwater extraction reductions could limit future delta submergence.

This research modelled Mekong Delta high tide submergence area for each year between 2020 and 2100 across different future groundwater extraction and sea level rise scenarios. When using a median sea level rise estimate, if no groundwater extraction occurred by 2100, 38.3% less of the delta was inundated in 2100 compared to a 'no-reduction' scenario, saving 6,037.2km² of land from submergence.

Improving groundwater extraction management could therefore substantially reduce future delta submergence. Unfortunately, the Mekong Delta Plan focuses on constructing defences, like embankments, to combat rising sea levels. This research highlights how more pragmatic management policies addressing other, often overlooked, causes of delta submergence, like groundwater extraction, are crucial.

Nevertheless, further research is needed. This investigation's methodology neglected to account for regional variations in groundwater extraction rates or differential coastline vulnerability. Only once more comprehensive regional data is available can groundwater extraction's impact be better assessed, essential to inform more pragmatic delta management practices.



Determining the effects of Phosphorus on growth and biofortified finger millet (*Eleusine coracana* L.) germplasms in formulating baby foods in Kenya

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Abstract

Communities throughout Africa, especially in Kenya, are experiencing food insecurity as a result of the drought. Although arid and semi-arid lands (ASALs) account for more than 80% of Kenya's land mass, there has not been a significant focus on utilizing a native "climate smart" drought resistant crop such as finger millet. The crop is nutrient-rich and has the potential to resolve worsening malnutrition, a lack of agricultural diversification, and economic stagnation due to its drought resilience, and high nutrient levels. The objective of this study was to determine how phosphorus levels and seed priming (acidic and alkaline) influence the growth and root structure of finger millet. Furthermore, the possibility for improving the low nutritional contents of finger millet by adding protein sources in the formulation of infant food was evaluated. The trials featured three finger millet genotypes (Nakuru FM1, U-15, and Snapping Green) in three replications. Data on germination rates, imbibition rates and nutrient profiles were analyzed. Results showed that water (control) highest germination rates (68%) while acidic and alkaline conditions reduced germination and growth of finger millet seeds. Nutrient analysis showed that, though biofortification increased phosphorus, calcium, and zinc for the baby formula, there was no significant difference in available protein against unfortified baby formula. Future research will investigate different protein sources to biofortify finger millet baby formula. Furthermore, germination tests will include additional concentrations of priming solutions to reflect the different oil abiotic stress conditions in drylands and its effects on growth and to yields.



A Creative Exploration of third-year Medical Student Learning Experiences

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Abstract

Medical student mental health has been reported to worsen during clinical training, with levels of emotional exhaustion and burnout peaking in the third year (Hansell, 2019). This research utilises a qualitative and creative methodology to explore third year student outlooks towards medical education, gaining insight into factors that influence student learning experiences and burnout.

Third-year medical students at King's College London uploaded narrative accounts describing educational experiences through an anonymous online form. Students were prompted to write creatively about any aspect of their learning experience they felt personally significant.

Narratives were analysed using a thematic approach to identify common themes. Students then attended a creative workshop, where they collaboratively discussed themes, and created poetry reflecting on student experiences.

11 written narrative accounts were analysed through a thematic approach. Identified themes include insecurity in clinical environments and challenges forming a professional identity (27% of accounts), lack of support and guidance (72% of accounts), feelings of isolation during placement and loss of social networks (45% of accounts), and feeling academic pressure, exhaustion and burnout (82% of accounts).

This research highlights several areas of medical education impacting on medical student experience. This includes challenges with forming professional identities in clinical environments, struggling to access support to manage academic workload, loss of social networks, and feelings of academic pressure and exhaustion. This research presents a creative methodology, using narrative accounts to explore lived student experiences and informs wider understanding of medical education experiences, and burnout amongst healthcare students.



Influence of coastal succession on endangered butterfly's habitat suitability and the abundance of their associated larval food plants

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Abstract

Coastal heathland is a rare and dynamic ecosystem in the UK which accommodates many threatened species. Species including butterflies, which require specific habitat properties and flora for the different stages of their life cycles. Butterflies showing recent declines in abundance are a favourite for scientific research. However, few published studies consider links between successional stages and butterfly habitat. This study investigates whether succession influences the quality of coastal butterfly habitat and larval food plant availability, with a focus on the Wall, Grayling, and Small Copper butterflies. At the study site, Winterton Dunes in Norfolk, dune stages were mapped through visual assessment and larval food plants were surveyed systematically using quadrats. Other habitat properties were surveyed which hold ecological importance to the targeted species including mean vegetation height (cm), presence of grazing and % bare ground cover. Existing butterfly transect data from the years 2008 - 2021 was obtained from the UK Butterfly Monitoring Scheme and used to provide an understanding of population sizes and locations within the dunes. Analyses will determine the extent to which the distribution of larval food plants and other habitat factors are dependent on successional stage. Management recommendations can be made with an understanding of these butterflies' complex niches, this can then help determine and focus conservation measures on the distinct habitat zones which best meet the species requirements. Further study has relevance within this research, which can be used to test successions' influence on other invertebrate species habitat suitability.



Modeling simultaneous two-wavelength axial ratiometry (STAR) imaging of clathrin mediated-endocytosis (CME)

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Abstract

Clathrin-mediated endocytosis (CME) facilitates the internalization of extracellular cargoes. However, how clathrin-coated vesicles (CCVs) form remains unclear due to the limited resolution of live-cell fluorescence microscopy and the need for sample fixation in electron microscopy. To bridge this gap, our lab developed Simultaneous Two-wavelength Axial Ratiometry (STAR) microscopy that leverages the wavelength-dependent properties of Total Internal Reflection Fluorescence (TIRF) microscopy. Dual-tagging a protein of interest with two spectrally separated fluorophores allows STAR to measure the intensity ratio and retrieve the z-position of the protein. Although the exponential decay of the evanescent wave is critical for STAR, it results in an uneven excitation of fluorescently tagged proteins. This will bias STAR measurements when dual-tagged proteins are distributed on a 3D object such as CCVs. To understand the accuracy of STAR for studying vesicle formation, we used mathematical modeling. We represented the CCV as a monodisperse sphere and used the STAR equations to calculate vesicle height (Δz) and compared it to the “ground truth” center of mass (CM). We investigated the influence of vesicle formation, radius, the number and distribution of proteins, the distance of the vesicle from the plasma membrane, and Poisson noise on STAR. This mathematical model of STAR microscopy assesses how the Δz measured by STAR compares to the ground truth. The theoretical findings will be used to relate experimental Δz results to vesicle morphology and eventually to develop a 3D dynamic model of CCV formation from our experimental data.



The Impact of Pre-Release Player Testing and Community Feedback on Final Releases of Video Games.

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Abstract

This study aims to answer the question “To what extent can public play testing of early beta builds benefit the overall development and release of a video game?”

Public playtesting and early access have become key terms in game design. Developers improve their product by utilising early access funding models on platforms like Steam which can be seen in the success of recent releases such as Sons of The Forest (Newnight, 2023), Raft (Axolot Games, 2022) and Phasmophobia (Kinetic Games, 2020). This method may also have negative connotations however, in developers releasing incomplete or buggy titles which may impact the reputation of the developer.

This study will implement an iterative video game development using an Agile methodology, releasing incremental builds to a select ‘player base’ who will in turn give their feedback to be included in the development thus tailoring the game play experience and focusing on player wants and needs.

It is predicted that overall, it would be a beneficial practice to develop a video game with player base involvement, as existing research (Futter, 2017) shows that the marketisation of the early development stages of a game has allowed more end users access to alpha and beta tests which in turn generates more income for the studio from the increased interest in the product. The implications of the research could also be translated to other developments such as applications to improve the development process of products like social platforms in order to tailor them more to their user base.



How should Security Awareness campaigns be designed.

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Abstract

The use of information technology has dramatically changed over the past decades. The profile of the user has changed significantly over the years, and an end-user today could be anyone from the CEO to the lowest clerk. As a result of the huge progress made, security became a hot topic as many experienced security issues. Several ways and measures have been taken to reduce these invincible frauds and scams and protect individuals from becoming victims. In the first era of computers, the computers were so large that security was easy to implement using physical access control. Since the emergence of a multiuser computer environment, in addition to physical security measures, technical security measures have been involved in authenticating users. However, it became no longer possible to maintain effective security with physical and technical controls alone. Therefore, it was required to educate users in the discipline of information security.. Currently, organizations are using the most effective methods to communicate with and educate users on secure computing practices and to make them make security-conscious decisions by implementing Information security awareness programs. This paper seeks to investigate the effectiveness of the cyber security awareness programs offered in the UAE and to further study how they should be designed to have better outcomes. In this study, I examine the design of security awareness programs across the UAE by interviewing people from the IT departments of selected companies. Ultimately, this paper aims to contribute to the improvement of security measures for different institutions.



The Effect of Synthetic A β on Ciliary Membrane and Axonemal Proteins

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Abstract

Alzheimer's disease (AD), a progressive neurodegenerative disorder, is one of the leading causes of death in the United States according to the Centers for Disease Control and Prevention. AD is a common form of dementia that can be characterized as plaque formation in the brain. Primary cilia are immotile signaling organelles present in all eukaryotic cells including neurons and astrocytes. Defects in the primary cilia lead to ciliopathies, such as being impaired neuronal development and cognitive domains, also compromised in AD. The hallmarks of Alzheimer's disease are the development of extracellular amyloid- β (A β) plaques and tau tangles leading to neuronal death, A β is the by-product of the proteolytic cleavage of the amyloid precursor protein, APP. Accumulation of A β leads to a cascade of events, ultimately resulting in memory loss and cognitive decline, major symptoms of AD. Previously in Dr. Saunders' lab at Drexel University, it was observed that APP localizes to the primary cilia in the presence of both extra-cellular and synthetic A β , the primary cilia structure is disrupted.

In this study, we aim to delineate the localization of major ciliary proteins, membrane (ARL13B) or axoneme (Tau & pTau), in the primary cilia affected first in the presence of synthetic A β . This was observed through immunofluorescence and imaging software to quantify cells that had specific ciliary proteins. There was a greater decline in axonemal proteins than membrane proteins in a 24-hour incubation. A decline in both types of proteins was seen in a 48-hour incubation.



Queering the Ure Museum

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Abstract

Queer identities, both mythic and real, were ever-present in Graeco-Roman antiquity. Ancient sources, ranging from epics to material artefacts, offer glimpses into issues relating to queer identity that affected people's lives in the ancient Mediterranean. While these sources evidence erotic desire and have enabled scholarly understanding of gender and sexuality in the ancient world, they also attest to uncertainties and are therefore subject to interpretation. We embarked upon *queering* the Ure Museum both to showcase an inclusive and diverse array of stories from antiquity through the museum's collection of artefacts and to encourage visitors to contemplate these ambiguities.

I began my research with a selection of relevant artefacts. I then consulted ancient stories that could be told through these physical objects in the Ure's collection. Some relevant stories are known, for example, from literary works such as Ovid's *Metamorphoses*. Then, I used modern scholarship on antiquity and queer studies to understand current academia on topics such as the god Dionysos' sexuality and interpretations of Medusa as a victim of the male gaze.

This research has shown that queer history is history, not a theme or minor chapter. It is important to show museum visitors that even, though these figures in the past did not have the same labels we have today (gay, bisexual, lesbian, etc.), they did exist in the past. This project has also allowed the Ure to stand as a queer ally and create a space in which all can connect with the past.



Investigating the Prevalence of Primary Hyperaldosteronism in a Dual Ethnic Cohort of Hypertensives

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Abstract

OBJECTIVES: Primary Hyperaldosteronism (PA) is a disease characterised by excessive production of the hormone aldosterone from the adrenal glands. It is the most common secondary cause of high blood pressure (hypertension), as well as being the most curable cause of hypertension. The prevalence of PA in the hypertensive population is unknown, hence here we investigate the prevalence of PA in a dual ethnic cohort of hypertensives.

METHODS: A retrospective analysis of 498 hypertensive patients from Guy's and St. Thomas' NHS Trust was performed. Cases of suspected PA were identified by an aldosterone to renin (a bodily enzyme) ratio (ARR) > 90 pmol/mU. The number of patients undergoing subsequent investigations in both cohorts was noted, such as confirmatory diagnostic tests. We also investigated the prevalence of the low renin subtype of PA in both cohorts, which is a renin level < 5.5mU/L.

RESULTS: There was a greater prevalence of PA in black subjects vs white (28.2% vs 8.90%). We also found a greater prevalence of the low renin subtype of PA in the black UK population (41.5% vs 11.3%). Imaging yielded a pathology known as adrenal adenomas as the most common cause for PA in both groups. Only 2 patients underwent adrenalectomies (a surgery to remove the adrenal glands) in the cohort studied (both black subjects).

CONCLUSION: The definitive treatment for PA resultant from unilateral adrenal pathology is adrenalectomy. The low number of confirmatory tests done highlights the need for more robust clinical guidelines and more definitive treatments for hypertension.



Development of Power BI Dashboard on COVID 19 Sickness Absences

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Abstract

The study focuses on the development of a dashboard using the data analytic tool Power BI. Through research, it has become evident that Power BI is an effective tool for data analysis. According to Singh and Jadhav (2022), Power BI has transformed the business intelligence, data visualization, and analytics industries. Power BI is an online tool that enables users to search for data, convert it, visualize it, and share the resulting reports and dashboards with other users in the same or different teams or companies, as well as the public. As of February 2018, approximately 200,000 enterprises in 205 countries use Power BI.

The aim of the dashboard is to give a visual insight into sickness absences relating to COVID-19 types. As suggested by the authors Bocij, Greasley, and Hickie (2015), the testing of the design should not be overlooked and should be seen as a continuous activity. feedback on the prototype design, as well as ongoing efforts to improve the dashboard through validation and verification. verification. by communication with the Development and Standards Group and through individual contacts. The final step in design is to gather and evaluate feedback on usability, functionality, and the overall design.

It is predicted that the Power BI dashboard will give a story on the Lancashire County Council's workforce based on their COVID-19-type cases, alongside other sickness absences. By using historical and present data, it will provide quick access to the most up-to-date information to aid data-driven decision-making.



To what effect does stakeholder feedback enhance a Business Intelligence product?

Sammy Tindale

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Abstract

This study focuses on stakeholder feedback collation in relation to external facing Customer Business Intelligence reports. Feedback loops encourage monitoring and measuring of improvements to designs and developed innovations (Beausoleil, 2022, p.71). Adoption of ITIL practices within Vodafone, implies that “service quality depends on the management of improvement opportunities” (E.A, 2020, pp.141, 142).

To collect results, a questionnaire will be distributed to all the users of the platform (300+) where the reports are displayed. The questionnaire will include quantitative and qualitative questions to assess the level of satisfaction with the current standardised report offering and to highlight the key areas the stakeholders believe could be improved. There will be a pilot study with members of the team who are already familiar with the reports so to see if the questions generate the answers applicable to the question.

The project is predicted to highlight some key areas where improvements could be made, so to enhance all standardised reports for all stakeholders. There will be a presentation back to the stakeholders of the key themes we believe we have identified. Afterwards another survey will be sent to the same sample of users to decide if we have addressed their concerns. If there are recurring themes throughout then the survey has been successful and demonstrated that collating information via questionnaires from a vast quantity of stakeholders is beneficial to a BI report. Moreover if the stakeholder feel we have identified the key themes they raised this further enhances the reliability of the method.



Aquatic Environments, Decomposition and the Forensic Importance of Diptera in Criminal Investigations

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Abstract

This research seeks to recreate the crime scene of the serial killer case of Orestes, in which the perpetrator chopped up one of his victims and placed her into a suitcase that was later thrown into a lake. The recreation aims to gain an insight and provide more data on the subject of underwater graves with concealment in a suitcase.

The presence or absence of different species of insects provides information about the time passed since an individual deceased, since each insect species has their own unique developmental period. Therefore, the presence of an adult fly indicates that an individual became deceased within a set period of time, in accordance to the insects found on the body and their ability to reach a specific developmental stage.

There is still no accurate way to calculate the post-mortem interval (time since death). There is, therefore, a need to create better forensic tools that will enable scientists to be more confident with their estimations. The research concludes that the presence of water slows down the rate of decomposition. This can be supported by the ADD calculations, alongside the information provided by the different stages of decomposition that each cadaver reached by the end of the experiment.

The study encourages further research on underwater graves and suggests that there are different variables (such as location, temperature, season, material of concealment and clothing, scavenging activity etc.) that affect the rate of decomposition. The research also supports the importance of diptera in criminal investigations.



Effect of Inulin Supplementation on Appetite, Mood, Stress, and Gastrointestinal Symptoms in Healthy Adults.

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Abstract

Prebiotics are functional foods which feed probiotic bacteria in the gut. Research has found health benefits of probiotics on the immune system and gastrointestinal diseases, as well as associating gut health and brain function. Despite there being increased research on the gut-brain-axis, distinguishing a connection between the gut microbiota and mental health, research is lacking on the impact prebiotics have on anxiety and stress. Therefore, the study aims to test the effect of a prebiotic supplement (inulin) on appetite, gastrointestinal symptoms, mood, and stress in human participants.

The study will be an experimental design, in which participants take 10g of inulin daily for 4 weeks. Participants body composition will be analysed at the start and end of the trial. To measure potential changes in appetite, gastrointestinal symptoms and mental health symptoms, participants will complete 4 questionnaires and a 3-day food diary, at the beginning, mid-point, and end. Data will be statistically analysed, to conclude whether inulin supplementation impacted upon variables measured.

The research study predicts after 4 weeks of daily inulin supplementation, participants appetite will reduce, alongside an overall improvement in wellbeing including mood, stress, anxiety, and gastrointestinal health. With a rise in mental health disorders, it is important to research alternatives to medication to help reduce symptoms and adverse side effects. Further research perspectives could focus on adapting the amount of inulin consumed, if other prebiotics elicit similar findings to inulin, and/or extend the length of time inulin is consumed by participants, to evaluate if findings are enhanced.



How Development and Experience Affect Perceived Cognitive Load During Distracted Driving

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Abstract

Inattention while driving increases cognitive load and the risk of Motor Vehicle Crashes. Youth and driving inexperience are strongly associated with crash risk, and, together, may impact cognitive load while driving, particularly when distracted. This project examined the effects of age and driving experience on perceived cognitive load during simulated drives with varying levels of distraction. It was hypothesized older age and greater driving experience would be associated with lower perceived cognitive load.

Drawn from a larger, longitudinal study, 190 teens (Mean Age=17.12 years, SD=1.98; 53% female; 53% non-white) were recruited from United States high schools based on age (16 vs. 18 years) and licensure (non-licensed [n=109] vs. licensed within 2 weeks of recruitment). Participants completed three drives in a high-fidelity driving simulator. A randomly ordered distraction task (no task, cellphone call, or texting) was completed for the duration of each drive. After each drive, participants completed the NASA Task Load Index (TLX), a well-validated self-reporting measure of perceived cognitive load.

Repeated measures analysis of variance indicated mean TLX scores were significantly higher in both calling and texting conditions compared to no-task drives. Non-licensed teens reported significantly higher TLX scores than licensed peers only in the no-task condition, especially aged 16. Results suggest that although experience may lower cognitive load for undistracted driving, distractions increase cognitive load regardless of experience. Teens acknowledge that distractions increase cognitive load, so driving education efforts may consider including driving simulators to safely demonstrate the differential cognitive loads and negative effects of distractions while driving.



Guiding Players Using Environmental Design

Richard Ferguson

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Abstract

This study aims to investigate how players make decisions in video games based on visual and audible cues. Research shows that a player's choice is based mostly on instincts/intuition when reacting to environmental cues and their similarities to past experiences (Winters and Zhu, 2014). The research will investigate how different environmental design elements such as lighting, colour, and spatial layout, affect player behaviour and decision-making in video games.

Participants will be given a survey about similar games utilizing environmental cues, using this research a game level will be developed, it will consist of multiple paths and a second study will be done where participants will explore this level and will be assessed on their reactions to different stimuli and their in-game choices. A questionnaire will also be administered after the second study to gather information about players' decision-making processes and factors that influenced their choices such as a list of favourite genres and games. The results will be compared to assess the extent to which players' in-game choices reflect the expected choices based on environmental stimuli.

It is expected that the majority of players will utilise environmental stimuli due to intuition to help sway their decisions on which paths to choose when playing (Freytag and Wienrich, 2017) however players who tend to play games that do not require player awareness may be less likely to make their choices based on intuition.

This research could potentially aid game developers in nurturing the further adoption of implicit directions in games.



Firm Size & Executive Compensation in the UK

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Abstract

There is widespread concern that corporations are failing to deliver an efficient allocation of resources and equitable remuneration arrangements. Public confidence in the efficiency of the executive labour market has been eroded by corporate scandals, the financial crisis (where inappropriate executive incentives were a contributing factor) and charges of corporate and political elitism. Against this backdrop, policymakers have tightened regulatory oversight of the executive labour market and the pay-setting process for directors. I argue extensive regulatory efforts have failed to discipline executive remuneration because the evidence base from academic research has, by and large, been unable to assign causality when documenting the relationship between executive incentives (pay and dismissal) and corporate performance. The aim of this project is to address this gap and determine what drives executive compensation in the UK. Evidence suggests that firm size is an important factor, see Golan et al. (2015). I use a large dataset of executive directors of companies listed on the London Stock Exchange. This dataset is provided by Minerva Analytics and contains information on executive remuneration and corporate governance for the period 1996-2017. However, this dataset does not include information on executive qualifications, experience, and transitions of executives after they leave the firm. I extend this dataset using hand collected information on executive education and subsequent career choices, available in the public domain (annual report and accounts, regulatory news announcements and social sites such as LinkedIn).



Big, bad bugs: Quantifying non-viral Gastroenteritis in Islamabad, Pakistan

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Abstract

Gastroenteritis is a common illness characterised by sudden onset diarrhoea caused by infection with enteric pathogens, causing millions of infections and deaths globally. Developing nations bear the global burden of disease, experiencing the highest rates of infections and deaths from non-viral enteric pathogen infections annually. This is often due to poor public infrastructure, including waste treatment and water supply. This project investigated the role of waterways in the transmission of non-viral gastroenteritis in Pakistan by quantification of non-viral gastrointestinal pathogens from the waterways around Islamabad. I analysed soil samples collected from upstream mid-stream and downstream sites in the Rawal Dam and associated rivers, for three bacterial pathogens (*E. Coli*, *C. jejuni*, *Salmonella spp.*). Pathogen levels at each site were investigated by quantitative polymerase chain reaction (qPCR) using two assay kits, Taqman™ and SYBR Green™. Soil composition impacted DNA quantification, limiting the strength of conclusions drawn about bacteria levels. However, in comparing the two assay kits, Taqman™ was shown increased consistency and reduced off-target amplification. The strain caused by non-viral gastroenteritis in developing regions demonstrates the importance of increasing understanding of transmission and improving diagnostic methods. The results obtained here indicate the presence of the target organisms and indicates Taqman™ to be the optimal reagent for qPCR, with higher efficiency. With the recent major earthquakes and flooding in Pakistan, Gastroenteritis spread is inevitable, lending support to further developing accurate quantification methods and that is where this research comes in. With optimisation of these assays, this research could be integral to future efforts.



Cracking Passwords in Linux

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Abstract

Research shows that the fastest hacking methods currently being used utilise Linux Kali and virtual machines. When considering research, the main gap in this area is the advancement of technology and how this has been used across industry. This advancement seems to be the advancement of security concerns. This research and project will then focus on expanding the knowledge of password cracking tools, discovering new virtual machine capabilities, and setting up an external server in VirtualBox that can be used to test cracking methods.

The literature review will lay the foundation for an experiment that uses password tools in virtual machines. The literature will conduct a comparison of different password cracking and hacking tools, specifically using Linux Kali and VirtualBox. John the Ripper is the "fast and reliable" toolkit that contains different hash types and different OpenSSH private keys, PDF files, ZIP and RAR archives, and Kerberos TGT. (Said, 2020)

The potential contribution this research has to the field of technology and even society could be substantial, as many businesses and personal users store data that must be protected from potential thieves. It is expected that the results will show that John the Ripper is the most reliable way to crack a code now that technology has gotten better.

Following this research, other areas that could be included, such as big businesses in cybersecurity, would offer higher protection for password implementation for systems both locally and nationally.



Investigating the Significance of N-MYC-WDR5 Interaction in Pediatric Neuroblastoma

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Abstract

Neuroblastoma (NB) is the most common solid-tumor pediatric cancer, and high-risk cases associated with N-MYC amplification show a 50% 5-year survival rate. N-MYC is an oncoprotein transcription factor that causes the transformation of a healthy cell into a tumor cell, and thus functional inhibition of N-MYC is a sought-after therapeutic goal. Recently, the chromatin regulator WDR5 was discovered as an important MYC co-factor that can modulate MYC target gene expression, and evidence in N-MYC amplified NB cell lines shows extensive co-localization of N-MYC and WDR5 at genes involved in multiple important biological functions. These data suggest that the N-MYC-WDR5 interaction may control a variety of important N-MYC related functions, however a clear analysis focused on any single function individually is currently lacking. Thus, this study was designed to determine if blocking the N-MYC-WDR5 interaction alters expression of genes linked to apoptosis, a well-studied function of N-MYC. Using multiple engineered NB cell lines, we performed mRNA analysis of pro- and anti-apoptotic gene expression. Interestingly, results of this study reveal that blocking the N-MYC-WDR5 interaction does not cause overt changes in apoptotic gene expression, suggesting that blocking the N-MYC-WDR5 interaction may not be sufficient to induce apoptosis. However, future studies using different cell lines or alternative methods may be useful to confirm these results. Given the extent of N-MYC and WDR5 co-binding at genes involved in essential biological processes, future investigation is warranted to deduce the totality of cellular consequences that occur when WDR5 cannot bind N-MYC in these deadly malignancies.



Degradation of microcrystalline cellulose by new isolates of adherent, biofilm-forming bacteria

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Abstract

Cellulolytic bacteria employ a variety of different strategies for the degradation of cellulose. Our laboratory is interested in biofilm-mediated breakdown of cellulose and possible roles of exopolysaccharides in this process. As part of an effort to isolate new strains of biofilm-forming, cellulolytic bacteria, soil samples were collected from sites rich in decaying vegetation and used to inoculate a minimal growth medium containing a MOPS/Tris buffer (pH 7.4), a combination of inorganic salts, 0.05% yeast extract, and 1% microcrystalline cellulose (MCC) as the primary source of carbon and energy (MSYE-MCC media). These cellulose-enrichment cultures were grown aerobically at 30°C for 2 weeks in a shaking incubator, and culture samples were then spread over the surface of tryptic soy agar (TSA) plates. Colonies on TSA were streaked onto agar plates containing the MSYE basal medium plus either 1% carboxymethyl-cellulose (MSYE-CMC media) or 1% filter paper cellulose (MSYE-FPC). One dozen new, cellulose-degrading strains were isolated and initially characterized according to colony morphologies, cellular morphologies, Gram stain reaction, and other outstanding features. Phase-contrast microscopy was used to observe cultures grown in MSYE-MCC media, and strains which attached to MCC particles and grew as biofilms on the surfaces of the particles were selected for further study. These strains were also screened for the production of extracellular material as detected by phase-contrast microscopy. A few strains produced possible glycocalyx layers during biofilm formation and utilization of cellulose. These extracellular layers, and any exopolysaccharides associated with them, will be the primary focus of future research.



What Makes a Surgical Candidate?: The Role of Sexuality & Personality in Cosmetic Surgery amongst Western Women

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Abstract

A variety of psychosocial factors have been shown to influence attitudes towards cosmetic surgery, differing between cultures and their respective beauty ideals. This study aimed to explore psychosocial factors and their relationship to cosmetic surgery, in order to further assist physicians and psychologists in selecting surgical candidates that will benefit from elective procedures. Nine psychosocial factors postulated to influence the interest, motivation, and acceptance of cosmetic surgery are reviewed amongst Canadian ($n=97$) and German ($n=115$) women aged 21 to 40 (*mean age = 24.79 years*). Correlation results indicate interest and motivation to undergo cosmetic surgery appears to be moderately influenced by neuroticism amongst the total population, as well as in both the Canadian and German cohorts. Additionally, Canadians demonstrated a moderate negative effect between motivation for cosmetic surgery and having their first sexual experience at a young age. This relationship was not found within the German cohort, with a t-test showing that the Canadians reported an overall higher motivation for undergoing cosmetic surgery than the Germans. Given these findings, surgeons should aim to incorporate questions exploring sexuality and personality into pre-surgical consultations to help determine whether a surgical candidate's mental health could benefit from undergoing a cosmetic procedure, while also acting as a protective measure to reduce harm by identifying candidates who are not suited. Future research should aim to develop a standardized test instrument to facilitate replication tests via a relative scoring metric, as well as extending the sample population to include additional nationalities, genders, and age groups.



"An Investigation into the differences in attitudes towards mental health and the individual mental health status of Christians and Atheists"

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Abstract

In my research I investigate Christian and Atheists mental health and their attitudes toward professional and pastoral support. My research seeks to understand how religious affiliation correlates to mental health, taking into consideration the conditions that religiosity can provide. This may mean that Christians have an overall more positive mental health due to daily practice of reflection and contemplation. I used a questionnaire of ten open and closed questions which 39 ppts answered anonymously. The questions establish religious identity, which follows a series of questions asking about personal emotional history and attitudes to support they may have received. After data analysis I found that Christians have an overall more positive mood and are more receptive to mental health treatment. My findings are impactful due to psychological advantages individuals with religious belief have, supporting faith practices as a positive lifestyle choice. Yet, I must consider that I cannot conclude if the belief in Christianity provides positive mental health, or if the practices that are used within the faith provide this. Nevertheless, Christian practices could be adopted into mental health care to provide more effective support measures. Therefore, the results of my questionnaire are just preliminary and further investigation into the correlation between emotional state and religious belief would need to be performed through investigation into brain activity and its chemical reactions to faith.



Socratic Questionnaire: New Interactive Online Methods in Experimental Philosophy of Language

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Abstract

Experiments in philosophy of language is experiencing a turn in recent year, methods of the cognitive sciences are used when informing questions about the nature of meaning and communication. Our research was developed to test the argument raised by some philosophers saying that standard surveys do not give us any philosophically interesting responds due to the lack of time and motivation provided to the participants to think hard about their answers.

The experiment was done in a naturalistic conversational setting. During the conversation, the participants were asked to explain and defend their answers against pushback from the experimenter. The Socratic Questionnaire was presented to the participants with online chats, and two different online surveys. Surprisingly, there is no evidence showing that giving people more time to think about their answers, in more naturalistic settings, leads to responses to philosophical scenarios.

From the results, we could see that there is no special need to carry the experiments out in a more naturalistic setting. The outcomes of the experiments help the researchers to choose the best method for their researches which raised the effectiveness and efficiency of the philosophy experiments. The public could then be in touch with the philosophical theories and concepts earlier.

Further studies on other features in Socratic questionnaires could be done. For example, the structure of the questionnaire, or the language use in presenting the questions. Discovering the factor affecting participants' responses could provide the researchers who wish to use Socratic Questionnaires in their studies a good reference.



“Not so cruel, after all?”. Dark Traits and Emotional Intelligence as Predictors of Punitive Attitudes

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Abstract

Punishment and reintegration are key in democratic systems. Decision-making and attitudes towards harsh punishment and social constructive approaches (e.g., reintegration, restoration) can be influenced by several factors, including societal and individual characteristics. Specifically, previous research has shown individual differences in punitive attitudes to be associated with 'broadband' personality traits, with the relationship being mediated by Authoritarianism and Social Dominance Orientation. However, there is only little further research of personal differences and punitiveness. Therefore, we aim to construct a similar model with more recent personality models: Dark Traits and Emotional Intelligence. We tested a model including 'dark' traits (Narcissism, Machiavellianism, Psychopathy, Sadism), Trait Emotional Intelligence, Social Dominance, and Authoritarianism as predictors of punitive attitudes. The variables were assessed through scales and mediation analysis was conducted. The model was found significant. Unexpectedly Psychopathy correlated negatively with harsh punishment instead of positively that was hypothesised. Finally, no significant mediation was found. According to our findings, Dark personality traits and Trait Emotional Intelligence may play a different role in punitiveness than previously assumed. This may challenge theories. Findings can be applied for jury selection and as a door-opener for both qualitative and quantitative studies on personality traits and the nature of attitudes.



Diversity of Endophytes in Sunn Hemp (crotalaria Junicea)

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Abstract

Sunn hemp commonly known as Mito, is a very important indigenous vegetable in Kenya. It also fixes nitrogen, good green manure, reduces soil erosion, conserve soil moisture, suppress weeds and nematodes, and recycle plant nutrients. It grows at fast rate in sub-tropical and tropical climates and its stem is used in industrial production of fiber. The crop is plagued with numerous biotic and abiotic stresses that can be solved by inoculation of endophytes. The objective of this study was to identify endophytes associated with sunn hemp and profile their functions. The healthy vegetables were randomly collected from vegetable farmers in Vihiga count, Kenya. Bacterial and fungal endophytes were isolated on nutrient agar (NA), and Potato Dextrose Agar (PDA) media supplemented with antibiotic, respectively. Pikovskayas media was used to test for phosphorous solubilization efficiency (PSE) while Jensen's media was used to test nitrogen fixation. Total of 31 bacteria and 22 fungal endophytes were isolated from the plant. *Aspergillus* spp was the most dominant fungal endophyte isolated with the highest PSE of 11.84%. 58.83% of the bacterial endophytes fixed nitrogen while 1.87% fungal endophytes were able to solubilize phosphates. The endophytes found to enhance plant growth promoting traits will be recommended for inoculation on seed or incorporated in soil to improve crop productivity. More research will be done on the other endophytes to establish their role in terms of pest, disease or drought resistance.



Effect of Foliar Nitrogen on Yield Parameters and Nodulation Among Common Bean (*Phaseolus Vulgaris* L.) Varieties in Kenya

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Abstract

Common beans (*Phaseolus vulgaris* L.) are an important source of food contributing to nutritional security to many people in Kenya. The symbiotic relationship between beans and native rhizobia enhances soil nitrogen (N) through biological nitrogen fixation (BNF). Due to low soil fertility, farmers rely on inorganic N fertilizers for higher yields whose frequent use limits BNF. However, the strategy in improving productivity is to combine the use of inorganic N fertilizers with BNF. Therefore, the objectives of this study were to identify the optimal amount of foliar nitrogen and its effect on nodulation and yield performance, and to characterize effective strains of rhizobia among two common bean varieties in Kenya. We hypothesized that the recommended rate of foliar N application would produce the most effective strain of rhizobia with a high yield performance. The field experiment at Njoro Sub-County, Kenya evaluated two common bean varieties at four levels of foliar N in a randomized complete block design with three replicates. Isolates from three root nodules sampled per plot were cultured on yeast mannitol agar at 28°C and their growth monitored for 5-7 days. The gram staining test revealed that 88% and 50% of the bacteria isolated from variety Chelalang and variety Wairimu, respectively, were gram negative. Optimal amounts of foliar N in common bean varieties will contribute to increased yield at reduced costs for small scale bean farmers. Characterization of rhizobia isolates may lead to superior strains. Further studies on the economic implications of foliar application will be done.



A Comparison of Barriers to Accessing Neonatal, Child, and Adult Hearing Screenings

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Abstract

As part of the Lancet Commission on Global Hearing Loss (HL), we sought to identify barriers to accessing neonatal, child, and adult hearing screening (NHS, CHS, AHS) interventions in HICs and LMICs and recommend policy solutions.

We searched five databases for quantitative articles describing barriers to hearing healthcare. We extracted these barriers following thematic domains in Levesque's "Access to Healthcare" Framework. Two reviewers independently assessed article quality using the Mixed Methods Appraisal Tool. We then compiled, summarized, and compared barriers to accessing NHS, CHS and AHS.

We found 128 articles describing barriers to hearing screening: 66 on NHS, 32 on CHS, 21 on AHS, 7 on NHS and CHS, and 2 on CHS and AHS. The most common barriers across HICs and LMICs pertained to "Appropriateness," or quality and coordination of care. These included limited provider knowledge, training, and support (n=19 articles) and organizational failures (n=18). Patients' "Ability to Pay" was the second-most commonly reported barrier, focusing on income inequality influencing care (n=17). The "Availability" of providers (n=16) and perceptions that HL is unimportant and lacks "Acceptability" (n=12) were also prominently reported.

Our findings reveal the importance of targeted policies, especially those related to the "Appropriateness", "Availability", and "Acceptability" of hearing healthcare on the supply-side, and the "Ability to pay" for hearing screenings on the demand-side. Potential recommendations include: improving provider education, training, and support; improving documentation, data collection, protocols, and systemic organization; incentivizing a greater hearing healthcare workforce across countries and settings; and standardizing and lowering screening costs.



To what Extent does Website Design Affect Customer Satisfaction and Usability?

Jane Hollowell

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Abstract

The purpose of this study is to evaluate how much website design influences user experience and customer satisfaction levels. The study will compare the levels of satisfaction a user derives from using a website developed in accordance with web heuristic guidelines and user-centred design principles. Accessibility, colour, logo, site navigation, and layout will be the areas of the site design that receive the most focus. Even though significant research has been done on user-centred design principles, it is questionable which layout will result in the greatest advancement in customer usability.

The aim of the study is to measure whether web design leads to increased levels of customer satisfaction. To collect results for analysis, three websites will be created, the first will be a control group website built with all 10 of Nielsen's heuristics applied to the design; these heuristics are described in detail by Nurhudatiana & Seo (2020). The second stage of a web site's design will be based on the needs and expectations of potential users and will be designed using the data gathered from interviewing a cross-section of potential customers. (Gall et al, 2021) The final site will be designed using a series of perceived personas created to represent the target audience for the website (Jansen, Salminen, and Jung, 2020)

Although I believe there won't be a difference in the levels attained by applying real-world or persona-based user-centred design principles, if there are any differences, they may be crucial to the development of this field in the industry.



Stochastic Approaches and Constraint Satisfaction of Gene Regulatory Networks

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Abstract

Computational biology is a rapidly growing area in which biological systems are being represented using software as opposed to making physical systems. Computational modelling has removed the need to use real cells in the pursuit of research thereby increasing efficiency of creating new biological systems. However, there are many applications of computational biology that have not been explored as thoroughly as they could be.

The study of synthetic biology has become increasingly important in the medical field. Gene regulatory networks are a part of this field, and there is a growing interest in how gene expression can be manipulated to infer specific properties.

Researchers may find useful a tool that can tell them what strength promoter to use based on what properties they want the final GRN to yield. Instead of modelling an existing network, we can use these models to create a new network. This project aims to produce a computational tool for researchers within this area, allowing models of real biological systems to be produced. It will make use of the current modelling and simulation techniques to determine how synthetic gene regulatory networks can be made. The software aims to find a gene regulatory network that satisfies constraints given by the user, as long as one exists. In a GRN, these specific constraints can be satisfied by changing the strength of the promoters that activate and inhibit the synthesis of proteins.



Investigation of NMDA receptor antagonists' therapeutic impact in global versus focal cerebral ischaemia: a systematic review and meta-analysis.

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Abstract

Background: NMDA receptor antagonism is a potential neuroprotective treatment for acquired brain injuries. While the efficacy of NMDA receptor antagonists has been widely investigated preclinically, subsequent clinical trials revealed neutral results at best. Moreover, it is unknown whether NMDA receptor antagonists perform differently in focal versus global cerebral ischaemia. We aim to compare NMDA antagonists in focal (ischaemic stroke) and global (HIE) models of ischaemia.

Methods: After conducting a systematic review of Medline (Ovid) and Embase databases according to the PRISMA guidelines a title-based and abstract-based screen was performed using Rayyan. Dependent values were extracted from the control and treatment groups, using a web-based data extraction tool where necessary. We then carried out a pairwise, stratified meta-analysis. Heterogeneity was assessed using subgroup analysis.

Results: 78 studies were identified, 57 for focal cerebral ischaemia (stroke) and 21 for global cerebral ischaemia (hypoxic-ischaemic encephalopathy, HIE). NMDA receptor antagonists proved significantly neuroprotective ($P < 0.001$) in both stroke and HIE. The overall effect size in HIE models was 2.9 (95% CI 1.45 – 4.5), and for the ischaemic stroke model 1.86 (95% CI 1.42-2.3). The NMDA receptor antagonists exerted significantly stronger neuroprotective effects in HIE models of ischaemia ($p < 0.01$), which included significant improvement in functional outcomes.

Conclusions: These findings may provide preliminary evidence to support further investigation of NMDA receptor antagonists in HIE. However, the reason for the larger therapeutic effect size in HIE models requires additional preclinical evaluation. These findings support the ongoing research in translational medicine and the development of neuroprotectants alongside recanalization therapy.



The African Cost of Sustainability: Impact of Environmental, Social, and Governance (ESG) performance on sovereign risk in Africa.

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Abstract

This paper investigates the impact of African countries' ESG performance on their sovereign risk, and by extension their cost of borrowing. This is a crucial study as many African countries are on the cusp of a seismic sovereign debt crises. However, we posit that ESG is a potential cure for Africa's debt woes due to the increasing number of ESG-oriented investors lending capital to countries with strong ESG performance. Capelle-Blancard et al. (2019); Martellini & Vallée, 2021, and Crifo et al., 2017 find a negative, statistically significant relationship between overall ESG performance and sovereign borrowing costs. However, none of these papers focuses exclusively on Africa.

Consistent with Margaretic & Pouget (2018), we will employ the one-step system Generalized Method of Moments (GMM) estimator in STATA to estimate the link between ESG performance and the sovereign bond yield spreads of our sample countries. ESG performance is measured using principal component analysis and data from the World Bank to construct a composite ESG index. In line with existing literature, we anticipate a negative, statistically significant relationship between ESG performance and sovereign borrowing costs.

We expect the results to indicate that African countries with stronger ESG performance have lower borrowing costs. This would suggest that strengthening country-level ESG is critical to reducing Africa's crippling debt burden and the likelihood of another catastrophic debt crises. Armed with such critical insight, African countries can strengthen their ESG performance to secure more favourable terms (notably lower interest payments) and raise more capital for their growth and development.



Does a life sciences student's demographic background correlate with their access to careers and developmental opportunities and, therefore their academic achievement as well as graduate destinations?

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Abstract

Nowadays, employers look for more than outstanding educational qualifications. Volunteering, placements, part-time jobs, amongst other opportunities are considered crucial to an individual's CV in the competitive employment environment. While universities offer these opportunities, this study aims to analyse why certain groups of students are and are not taking up the opportunities offered and what can be done to encourage equal participation to enhance their employment prospects upon graduation.

This study looked at life sciences students within two schools at Newcastle University. Student data from 2015-2021 was collected from Business Warehouse to gain insight into the student population. The following information was retrieved: gender, age, nationality, ethnicity, caring responsibilities, POLAR4 status, home postcode, disabilities or challenge group status and degree outcome specifically for graduates. The opportunities studied were ncl+ award completions, placement years, laboratory assistant roles, volunteering, vacation studentships, study abroad and university internships. This data was obtained via the university and the student's union.

Additionally, a survey was conducted that obtained 178 responses. This survey helped the study gain information on factors restricting and motivating students to uptake opportunities and on student demographics and characteristics. Moreover, 18 one-to-one interviews were conducted to understand how students can be supported and encouraged to partake in developmental opportunities. Data for these will be provided.

This study could provide data that could help implement strategies and solutions for underrepresented students to feel motivated to participate in career and developmental opportunities that are now essential to succeed in securing a job upon graduation.



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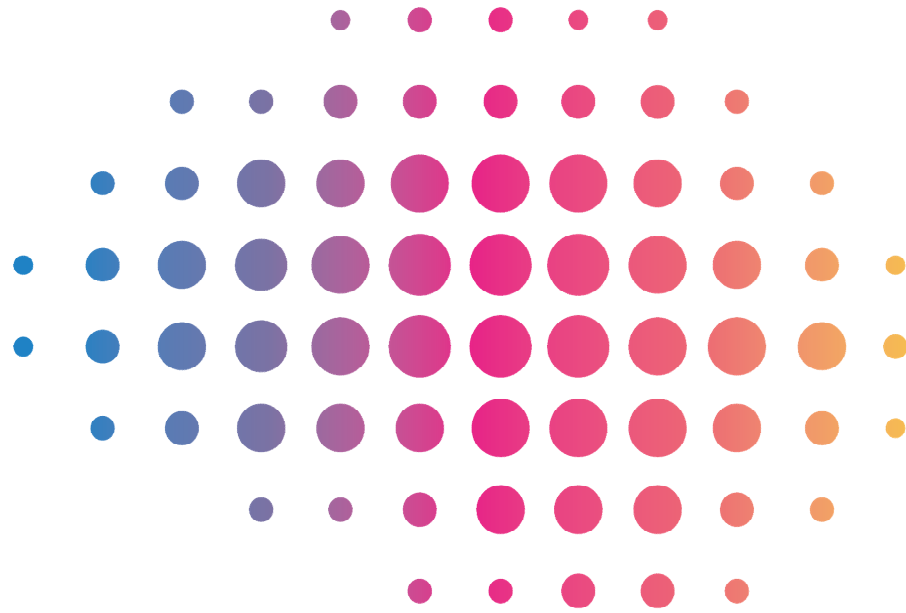
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