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Book of Abstracts

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Jonathan Kim

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Addressing unmet needs of patients with upper gastrointestinal (UGI) cancer through symptom monitoring

A focus on symptom monitoring could address the unmet needs of patients with upper gastrointestinal (UGI) cancers. For the instance of pancreatic cancer, a type of UGI cancer, prolonging survival has been difficult to achieve as only 15% of patients are eligible for surgery of tumour removal, surgery remains as the only curative treatment and more than 80% of patients present recurrence of disease after surgery. While the alarming percentages may vary with other UGI cancers, what is certain is the necessity to understand why these unmet needs persist and how to fundamentally address them. Monitoring symptoms with a palliative intent could be reinforced as optimal care and improve the patient's remaining quality of life. Designing a patient-reported outcome measure (PROM) that captures patient-reported outcomes (PROs), may address the unmet needs and expectedly improve the quality of care provided by healthcare professionals. Defined by the Food and Drug Administration, PROs are any report of the status of a patient's health condition that comes directly from the patient, without interpretation of the patient's response by a clinician or anyone else. Even though a PROM is solely a patient's report, the rigour, actionability and feasibility of developing such a PROM needs to be established first from the perspective and decisions made by the clinicians, nurses and allied health members including dieticians, psychologists, etc. Thus, the aim of the study is to develop an actionable, feasible symptom monitoring tool for patients with UGI cancers, based on the perceptions of healthcare professionals.

Scott Ho

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Understanding the immune response to the gut microbiota

The collective microorganisms that reside within the human intestines, also known as the human gut microbiome, are crucial for human health and disease. While many studies have suggested associations between the state of the microbiome and human health, there is limited understanding of the exact mechanisms of how the microbiome interacts with humans. The majority of previous studies establish association between the composition of the microbiome and human health without any certainty of that one directly influences the other. Thus, research into how specific species interact with the host is crucial to progressing towards establishing how the microbiome causes human health and disease. This project aimed to investigate how a single bacterial species influences the immune response. Epithelial cells from the colon were used (Caco-2 cell line) within the experimental model. The epithelial cells were exposed to the bacterial species chosen for six hours then the immune response was determined through how levels of certain genes were influenced by this bacterial exposure. The results suggest that these members of the gut microbiota do stimulate an immune response and that different species induce different levels of responses. However, biological replicates are needed to state this with confidence. This project validates this experimental model as a method to determine epithelial cell responses to the gut microbiota which will help to establish causative relationships between states of health and disease to certain combinations of bacterial species in the gut.

Declan Connoley

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The utility of the Enhanced Liver Fibrosis test in alcoholic liver disease

Background and Aims: Alcohol is the third commonest cause of death in 18-65 year-olds, with liver fibrosis severity correlating with prognosis. The Enhanced Liver Fibrosis (ELF) test is a biomarker able to stratify fibrosis severity. We assessed the diagnostic and prognostic performance of ELF in ALD.

Method: Paired ELF tests and liver biopsies from 786 patients were assessed. Results were compared between ALD (n = 81) and non-ALD aetiologies (n = 705). Prognostic data were available for 70 ALD patients for a median of 5.9 years. Multiple ELF thresholds were assessed and area under receiver operator characteristic (AUROC) curves used to determine diagnostic utility in histologically staged biopsies. Survival data were assessed using Cox Proportionate Hazard Ratios (HR) adjusted for age, sex and treatment centre; and logistic regressions adjusted for age and sex.

Results: Median age in the ALD cohort was 50. Diagnostic performance of ELF in ALD was excellent, with AUROC 0.895 in cirrhosis and 0.923 in moderate fibrosis. Using ELF 9.8 to exclude and ≥ 10.5 to diagnose cirrhosis, 87.7% of ALD cases could have avoided biopsy, with a sensitivity of 91% and specificity of 85%. A unit increase in ELF was associated with a 2.6 times greater risk of a liver related event (LRE) at 6 years.

Conclusion: ELF accurately stratifies liver fibrosis in ALD independently of inflammation. Prognostically, ELF performs as well as biopsy in ALD with performance similar to that observed in other aetiologies of CLD.

Kunal Mishra

Nanyang Technological University, Singapore

Identification of novel inhibitors against the malaria parasite Plasmodium falciparum(3D7)

Malaria remains one of the most prevalent mosquito-borne diseases on the planet, with 219 million cases reported in 2017 with Plasmodium falciparum accounting for more than half of these. While there are many antimalarials in use, there have been many instances of resistance reported, creating a need to develop novel therapies against the parasite. With the rising costs and low success rates of novel drug development, drug repurposing serves as an alternate strategy to develop novel therapies by speeding up the drug discovery pipeline. This study explores the concept of drug repurposing for use against malaria, with the eventual goal of identifying compounds which can be accelerated through the drug discovery pipeline for clinical testing. The Selleck Chemicals Anti-cancer library containing 414 anti-cancer compounds was explored for antimalarial activity via a medium-throughput screening (MTS) assays. Highly synchronised cultures of the drug sensitive 3D7 strain were grown in the presence of each of the compound (10 μ M in DMSO) for one complete life cycle, and growth inhibition was measured using a fluorescence-based assay. A total of 131 compounds showed complete growth inhibition against P. falciparum, with varying targets and mode of actions in cancer cells. Through an extensive literature study on the mode of action, pharmacokinetic data, current clinical trial progress, as well as prior studies in malaria, 50 compounds were determined to be suitable for further studies and validation.

Session 2B - Creating Connections Through Digital Applications

Adi Raber

Monash University, Clayton Campus

Can Cognitive Training Reduce Anxiety Symptoms in Children with Autism Spectrum Disorders?

Worldwide, 1 in 59 children is diagnosed with an autism spectrum disorder (ASD). Approximately 40% of these children also experience anxiety, making it one of the most common conditions to co-occur with ASD. Despite these staggering numbers, and the additional challenges anxiety presents further to existing ASD symptoms, there is a dearth of research relating to treatment for anxiety in children with ASD. There is evidence for the efficacy of non-medical therapies for anxiety, such as cognitive behavioural therapy and video-based modelling. However, these interventions may be less useful for children with ASD when compared to typically developing children, even when modifications are implemented to tailor therapy to the particular needs of children with ASD. This research aims to review randomised controlled trials in the literature of non-medical interventions for anxiety in children with ASD, highlighting the strengths and limitations of applying current interventions to this population. Moreover, this research seeks to outline the rationale behind moving towards computerised forms of cognitive training. These have previously been shown to ameliorate skills in various areas of cognition and behaviour in children with ASD, yet are presently lacking in the context of anxiety. A cognitive training program designed to target anxiety in children with ASD, while accounting for the unique presentation of anxiety in this population, may successfully alleviate challenges faced by an overwhelming percentage of children. Ultimately, this has the potential to improve the ability of children with ASD to cope with anxiety-provoking situations in everyday life.

Session 2B - Creating Connections Through Digital Applications

Koek Wei Jie Dominic

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Investigating the effectiveness of perspective-taking in video game

Migration has increased the ethnic and racial diversity of many countries in recent years, which could result in tensions among people. However, research has shown that video games have the potential to reduce prejudice and foster intergroup understanding. This study investigates the potential of using the video game “Papers, Please”, where players take on the role of an immigration officer to approve or deny immigrants and returning citizens. The game requires players to make moral decisions, which could serve as an intervention to reduce one’s prejudice towards immigrants. Past studies have also shown that challenge-skill balance might positively influence game-based learning outcomes. Even though the game challenge was significantly greater than participants’ skill, the findings of this study suggested that players experienced a small decrease in favourability and liking towards immigrants after 30 minutes of game play. Significant correlations were found between players’ perspective-taking of the immigration officer and their favourability of immigrants, which could evoke emotions, such as suspicions towards immigrants. During the gaming session, participants experienced moderate flow, significantly correlated to players’ skill in the game, that influenced players to take on the perspective of the immigration officer. Furthermore, game challenge did not appear related to change in favourability towards immigrants. Results of the study suggested that positive change in attitudes could be explored using video games that allow players to play the role of immigrants. Keywords: Immigration, Video Game, Perspective-Taking, Challenge, Skill, Flow, Prejudice

Session 2B - Creating Connections Through Digital Applications

Yaw Chue Yan Grace

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The Case of Singapore's Little India: A Failed Digital Ethnic Enclave Economy or a Hybrid in Progress?

In Migration studies, the phenomenon of an 'ethnic enclave economy' serves to help new immigrants to settle down, find jobs and access information from the host country, in hopes of achieving a higher socio-economic status. Existing literature expounds on how issues faced by inhabitants of these enclaves are because of geographical boundaries circumscribing the reach of minorities. Yet, these largely ignore the ongoing 4th Industrial Revolution, which is characterized by a transition towards digital infrastructure and technologization of society. Technology has caused the ethnic enclave to be no longer restricted to a bounded-spatial location due to the proliferation of digital usage among both immigrants and locals alike. This is especially pertinent given that technological infrastructure provides a perfect means for business transactions through virtual spaces such as social media and digital applications. However, the case of Singapore's Little India reveals that the digital metamorphosis of the ethnic enclave into a perfect hybrid of physical and virtual space - the digital ethnic enclave - is incomplete and flawed. We find this to be because of the ethnic configuration and demographics of Little India, as well as immigration/heritage management by the state, which can be improved. We use a grounded-theory approach, which is an interactive method of gathering data through ethnographies and interviews with key players in the ethnic enclave economy to explore these epistemic flaws. This paper contributes to the field in providing a greater understanding of integration dynamics (and issues) faced within the ethnic enclave economy in the Digital Age.

Elle Nguyen

Monash University, Clayton Campus

Sleep and mental health in new recruit ambulance paramedics: A 6-month longitudinal cohort study

Poor sleep and mental health disorders are prevalent among paramedics, particularly post-traumatic stress disorder (PTSD), depression and anxiety. Impaired sleep may be a risk-factor in the development of mental health symptoms, however, due to a lack of prospective studies in paramedics, our understanding of how sleep relates to mental health problems is limited. This longitudinal study investigated sleep and mental health symptoms in paramedics as they transitioned into their early career, and examined whether poor sleep prior to emergency work is related to the future development of mental health symptoms in this population. Shift work naïve Graduate Ambulance Victoria paramedics (N=27) will be studied at two time-points: prior to emergency work and after six months of active duty emergency work. Sleep patterns will be assessed over a 14-day period at both time-points using a sleep diary and an activity monitor. Validated questionnaires were used to screen for symptoms of sleep apnoea, insomnia, shift work disorder, trauma exposures, PTSD, and depressive and anxiety symptoms. A linear mixed model will compare potential changes in sleep and mental health symptoms between time-points. A multivariable logistic regression will determine the odds of new-onset mental health symptoms at the six-month follow-up, given baseline sleep difficulties. The results from this study are likely to determine certain aspects of sleep that may increase vulnerability to mental health symptoms and should therefore be targeted through sleep interventions. Ultimately, these findings have potential to inform industry policies to reduce the high rates of mental health problems among paramedics.

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Zhao Feng Liu

Monash University, Clayton Campus

Catching them before they fall: Falls in the Elderly and the Health Promotion Approaches to Prevention.

Falls are the most common source of injury amongst the elderly population in Australia. The likelihood and severity of falls increase exponentially with age. The public health challenge of this issue is expected to be further exacerbated by Australia's aging population.

The complications resulting from falls amongst the elderly pose a significant cost to the Australian healthcare system, both through the direct drain on Australia's finite medical and human resources, as well as in its indirect impact on the quality of life for the affected patients. It is estimated that the economic costs of managing fall-injuries will reach \$1.4 billion by 2051.

A literature review will be conducted to analyse the effectiveness of various preventative public health approaches aimed at reducing the number of falls amongst the elderly. These approaches aim to mitigate the risk factors contributing to falls, which can be categorized into biological and environmental factors. Preventative approaches can be grouped into two categories: active intervention seeks to make changes in an individual's lifestyle, such as promoting physical activity, whereas passive intervention involves approaches to increase public knowledge and awareness.

It is hypothesised that multicomponent approaches involving both active and passive intervention will be the most effective at reducing the rate of falls, compared to the nationwide average of falls without the aforementioned approaches. The implications of this study suggests that effective multicomponent interventions should be integrated into community programs to reduce the rate and complications of falls.

Clara Chee Wenxin

Nanyang Technological University, Singapore

Sign Language Interpreters and Deaf Participants Perspective Of The Interpreter's Role

The relationship between the Deaf community and hearing sign language interpreters is intriguing given that it is beyond that of service user and service provider. With these two groups of people coming from different communities and having had different linguistic and cultural experiences, there is a particular likelihood of miscommunication at times. The fact that professional interpreting is relatively new in Singapore, with no standardised certification for now, makes it even more challenging to ascertain what are the expectations one should have of a sign language interpreter. This may lead to differing expectations on the part of Deaf service users and the hearing sign language interpreters. This study hence seeks to investigate the expectations of hearing interpreters by the Deaf community as well as by hearing interpreters themselves of their own profession. 30 Deaf/Hard-of-Hearing participants, as well as 10 hearing interpreters, were surveyed on their expectations of hearing interpreters in various categories. These categories were: qualifications, language proficiency, proficiency in interpreting, professionalism, awareness of audistic behaviour and involvement in the Deaf community. The data was analysed using SPSS and the findings revealed significant differences between the two groups across the different categories, particularly in terms of the qualifications to be an interpreter. As such, this paper will look into the areas in which these expectations differ and provide possible reasons for the disparities in ratings between the Deaf community and hearing sign language interpreters.

Akhila Palekar

Monash University, Clayton Campus

Examining genetic counselling's impact on counselees' perceptions and behaviours in breast cancer genetic testing and for alternative genetic counselling methods

Hereditary breast cancer can be detected using numerous genetic tests, such as that of BRCA 1/2 testing. The communication of genetic test results necessitates genetic counsellors to communicate this information to the patient in a manner that conveys accurate risk perception and feasible surveillance options. Despite breast cancer's high incidence, literature reviews regarding genetic counselling practice and its outcomes are infrequent, thus a review of the current literature was conducted by firstly searching through the SCOPUS and Web of Science databases for studies related to 'breast cancer' and 'genetic counselling' and variations of these key terms. The studies included in this review (n = 22) examined either a mental health or behavioural outcome of traditional genetic counselling, or comparatively examined the outcomes of traditional genetic counselling with a supplementary or adapted method. Synthesising current research found several key concerns in clinical genetic counselling, it was found that whilst generally beneficial to counselees by reducing risk misperception, there was still a need to identify patients psychologically vulnerable to over-surveillance, for example from unnecessarily frequent mammograms. Furthermore, genetic counselling is yet to be optimally integrated into the healthcare system, particularly where test results and surgical decisions do not occur within the appropriate timeframe, necessitating a spotlight on the supplementary and adjacent resources identified in this review to streamline the genetic counselling process. Thus, this review identifies areas of key improvement in genetic counselling practice, particularly in onco-genetic counselling (OGC) which will only continue to be in demand as screening technology improves.

Session 3B - Intersections of Media & Multiculturalism

Hamamatul Hosen

Monash University, Clayton Campus

Unity or fragmentation? : The Media Representation of the French National Football team

France's 2018 World Cup win was widely embraced in the media as a joyous and unifying occasion. However, some also called it a win for Africa and used the event as an opportunity to comment on the multiethnic composition and ethnic heritage of the players. This contrasting representation highlights how the French national team (FFF) has historically been linked to the struggle over racial and ethnic identities in French society.

This research aims to examine the relationship between discourse surrounding national identity and the media representation of the FFF. I will address the following questions: What is the relationship between national identity and the FFF? Why does the media representation of the FFF fluctuate? What role do these representations have on the current debates on identity?

This study will incorporate a qualitative analysis of literature and media excerpts of the FFF. I will compare and contrast the different attitudes and language used in the media during different periods of the FFF's performance, namely in 1998, 2006, 2010, and 2018. I hypothesize that the media utilizes the multiethnic composition of the team during good performances to strengthen and represent the ideal French national identity. Yet, during poor performances or scandals, the media invites opinions that question the authenticity of the team's 'Frenchness'.

Overall, given the increasing hostility towards immigrants in Europe, the study may be useful in understanding and highlighting the extent of the tensions that are present in French society.

Session 3B - Intersections of Media & Multiculturalism

Leow Jing Xuan

Nanyang Technological University, Singapore

Driving Without the Brain? Comparing the Influence of Value Dispositions, Media Attention, and Science Knowledge on Willingness to Use Driverless Cars

Driverless cars can bring about various benefits when introduced to society, but only if they are widely supported and adopted by the people. Yet, little is known about the motivators of public support for driverless cars. This is especially true for the context of Singapore, even though driverless cars will be integrated into the Singaporean society in the near future. Our study employs the cognitive miser model, science literacy model, and media attention variables as theoretical frameworks to investigate the motivations behind people's willingness to use driverless cars. Findings from a nationally representative survey of 1,006 respondents indicate that value predispositions, especially affect, play a major role in shaping people's willingness to use driverless cars. Furthermore, benefit perceptions mediate the relationship between affect and public willingness to use driverless cars. Meanwhile, scientific knowledge and media attention have limited influence on willingness to use driverless cars. The findings establish a foundation for understanding public acceptance of driverless cars, while corroborating past studies in affirming the significance of the cognitive miser model over the scientific literacy model. We conclude with practical strategies that can aid stakeholders in effectively communicating about driverless cars to the public.

Session 3B - Intersections of Media & Multiculturalism

Ravathi D/O Gunasegaran

Nanyang Technological University, Singapore

Tamil Writing Teachers' Perception about the Role of English in the Classroom

This study examines Tamil writing teachers' perception about the role of English in Tamil classrooms. Kadakara (2015) found that Tamils tend to replace their mother tongue with English language, the dominant language as it is more distinguished and has a greater influence. This implies that Tamil students tend to be far more proficient in English than in Tamil. This may pose challenges in the mother tongue classrooms. Students also find writing to be the most difficult skill to learn as opposed to listening, speaking and reading skills in Tamil classrooms. Canagarajah (2006) states that multilingual writing should not be viewed as a narrowly defined process of text construction and it is critical to consider the repertoire of a writer than that of a language or culture. He suggests creating a classroom environment where "first language is treated as a resource and not a problem" (p. 603). In this study, semi-structured interviews were conducted with 3 teachers from primary schools and 3 teachers from secondary schools. The study reveals that writing teachers primarily take process-oriented approach in teaching Tamil and that students face difficulties in the correct use of terms of address and specialised lexis as they often are translating these terms from English. There is also a lack of awareness in the stylistic variation between English and Tamil language. These difficulties have resulted in Tamil language teachers viewing the presence of English language as an impediment rather than a resource in the Tamil classrooms.

Session 3C - Education & Innovative Learning

Ryan Buhagiar, Asher Lim & Shayla Rance

Monash University, Clayton Campus

Student-led pro bono IT services for small non-profit organisations

Non-profit organisations (NPOs) support social and economic development by providing services for communities and advocacy for various causes. IT solutions can improve organisational efficiency, communication, reach, and impact in small NPOs. These range from common solutions like website development, to advanced applications like biometrics. The literature identifies a lack of skilled personnel as a barrier to IT use for small NPOs. There are also generalised suggestions from government to increase technology use within small NPOs. Furthermore, existing volunteering platforms offer limited opportunities for undergraduates to volunteer in a professional capacity.

Session 3C - Education & Innovative Learning

Veronica Yuen Sok Yee

Nanyang Technological University, Singapore

Improving Singapore Primary Schools' Strategies to Promote Reading Literature

The National Library Board's 2016 National Reading Habits Study on teenagers reported that only 25% of the respondents read fiction books more than once a week. There is hence significant room for an increase in the consumption of literary books. A method to do so is to inculcate the habit of reading at a young age. This, in turn, positively affects the development of reading and cognitive skills. Reading at a young age also aids the development of 21st century competencies and lifelong learning. The finding is supported by an analysis of literary texts targeted at children. Given the benefits of reading literature at a young age, this paper aims to investigate how local primary schools' strategies to promote reading literature can be improved. Primary school students are targeted because primary school education is compulsory in Singapore. Schools also play an important role in inculcating the habit of reading in children, given the hectic work schedules of parents. To achieve its objective, this paper analyses the strategies that local primary schools adopt to promote reading. That of British primary schools will also be examined because Singapore closely follows Britain's education system. The findings are subsequently used to create a student-centred collaborative model that primary schools can adopt to enhance their promotion of reading. This paper will conclude with an analysis of the limitations of the study and propose areas for further research.

Session 3C - Education & Innovative Learning

Joel Hung Yi Guang

Nanyang Technological University, Singapore

Parental Involvement in Children's Education

Using a case-study approach, this project seeks to investigate how the parents of five families in Singapore are involved in their children's education. With the recent emphasis on holistic education by Singapore's Ministry of Education, this project examines, in particular, how far parents are concerned with both the academic and character/values education of their children. Given that adolescents are at a point in their lives when interventions by their parents are likely to have significant effects on them, the project concentrates on teenagers of 13-16 years old. Through interviews with both parents and children, the data shows not only parents' perspectives and rationales on their parenting practices but also how their children perceive and experience parental interventions or the lack of them in their academic and character/values development. This study sheds light on the important issue of teenagers' academic and character/values education and highlight some effective parenting practices in children's holistic education, given the emphasis on values in the 21st century.

Session 3D - Sustainability in Natural & Built Environments

Cole Teller

Monash University, Clayton Campus

Analysis of hafnium isotopes in zircons from Patagonian migmatites

The Famatinian Orogeny is a mountain belt in the Sierras Pampeanas region of northwestern Argentina, which formed between 490 and 460 million years ago. The granites which make up this orogeny originated in several cycles of active magmatism within this time period and are composed of melt originating from a chemically heterogeneous metapelitic protolith. The purpose of my research under Dr. Melanie Finch was to use hafnium isotopes entrained in zircons within migmatites to trace the geochemical homogenization of these granites as they are reworked from the original metapelitic protolith. The studied zircons originated from the paleosome (sample B1) and leucosome (sample B2) of a migmatite in the Famatinian Orogeny. The studied migmatite originated as a granite which underwent biotite dehydration melting, with the leucosome representing remobilized and solidified melt, and the paleosome being the unmelted remnant. The analysis was performed via laser ablated inductively coupled plasma mass spectrometry. Usable data was collected from 78 zircons, 40 from the paleosome and 38 from the leucosome at Monash University's Isotopia lab. The results indicate a reduction in variation in $^{176}\text{Hf}/^{177}\text{Hf}$ isotope ratios in sample B2 as compared to B1, which is in line with contemporary models which suggest that as a magma is reworked, mobilized, and physically mixed over time, it will experience gradual geochemical homogenization. The implications of this research are that the isotopic and chemical signatures of a rock may be traced through the evolution of a rock from protolith to pluton.

Session 3D - Sustainability in Natural & Built Environments

Baihe Zhang & Yuliang Chen

Monash University, Clayton Campus

An analysis into the habitability of Mars by comparing its fundamental living conditions with that of the Earth

Over the past several decades, the Earth has been confronted with extreme climates, global warming and natural disasters such as earthquakes and tsunamis. Consequently, it is imperative that we find a planet with similar planetary habitability to the Earth. Planetary habitability is the measure of a planet or an astronomical body's potential to develop and sustain habitable environments to life. Of all the planets in the solar system, cumulative evidence suggests that Mars is the most Earth-like planet regarding its water patterns, making it a promising substitution for the Earth. However, the differences between the two planets with respect to existing energy sources and physical conditions (temperature, climate, gravity, air quality, isolated and confined environment); makes it challenging for humans to habitat in this isolated and confined environment with higher space radiation and reduced gravity. Despite this, there has been a neglect in scholarship investigating the effects of the Martian environment. In this research, we will discuss the similarities and differences of the habitability factors between Mars and Earth considering their chemical, physical and geological attributes, and assess the challenges in maintaining an artificial habitable living environment for humans. In light of the existing literature, we anticipate that Mars has a great potential to be the planet for the emergence of new life, and that humanity's journey through the cosmos will ensure the survival of our species for many generations to come, as earthlings and Martians.

Session 3D - Sustainability in Natural & Built Environments

Sebastien Lucas-Lely

Monash University, Clayton Campus

Are we our Architecture

'We shape our buildings and afterwards our buildings shape us', Winston Churchill exclaimed in his 1943 parliamentary speech to the bombed English. This mentality has led to the neuroscientific research on how the spaces we inhabit have psychological impact on how we compose ourselves however is it possible that a building can have everlasting effect on our lives? Through understanding what elements and how a design can affect one's psyche; we can question whether an architect can become an autocratic designer; with the power to create super-spaces and the might to design malicious-spaces. This presentation aims to address what elements can be used to create appropriate fields how these elements can be adapted to manipulate how a user interacts with the space and if possible, how the user is permanently shaped. To discover these elemental considerations, a mixture of site visits and literary reviews will aid the discovery of the potential power of the architect. These site visits will be particularly aimed towards a mix of; high-rise apartments, town-houses, and individual residences; which will allow for analysis of the characteristics of these spaces, the lifestyles of the inhabitants, and how a life can be formed by the design. Data from this research can lead to more unique architecture better suited forms for its function and the possibility to transform traditionally malicious architecture into super-spaces.

Noorul Wasima D/O Annal Mohaideen

Nanyang Technological University, Singapore

Language Dominance and Identity of Tamil-English bilingual youths in Singapore

This article studies the relationship between language dominance and language identity of Tamil-English bilingual youths in Singapore. Being a multi-racial country with 4 official languages – English, Chinese, Malay and Tamil, Singapore has adopted a notable language policy. Residents learn English as first language and their respective Mother Tongue as a second language in schools. Despite equal emphasis, the decreasing second language usage among youths has been a growing concern in Singapore. However, language dominance may not necessarily be a direct reflection of a speaker's language solidarity. Hence, this paper assesses the extent to which language dominance affects language identity of speakers. 50 Tamil – English bilingual youths were chosen for this study. A 15 minute speech sample of each participant was collected and 50% of the data set was decoded for the measurement of language dominance. The analysis began with the calculation of Mean Length of Utterance (MLU) and moved on to the total number of English and Tamil morphemes in each utterance. Meanwhile, the youths took part in an online questionnaire showcasing the alignment of participants' language identity. Naturally, one may assume that an English dominant speaker will have a higher affiliation towards English language and vice versa. However, despite being largely English dominant, majority of the participants showed a deeper sense of belonging towards Tamil language. An interview with these exceptions, allowed us to discuss the role and implication of identity factors such as family, history and religion on language loyalty.

Session 4A - The Brain

Rebecca Kirkham

Monash University, Clayton Campus

The Acute Effects of Aerobic Exercise on Reward Processing and Decision-Making

Addictive-compulsive disorders (such as obsessive-compulsive disorder, impulse control disorders and substance use disorders) are the second greatest contributor to mental health burden. Despite this, there are limited intervention options, low levels of engagement and poor treatment outcomes. Whilst traditionally viewed as distinct diagnoses, all of these conditions are characterised by shared impairments in reward processing, decision-making and related neural circuits. As a potential intervention, aerobic exercise has shown early therapeutic promise in animal studies, however the evidence is still in its infancy for human studies and its possible beneficial role in reward processing and decision-making. This study aims to use a between-subjects randomised experimental design to investigate the effect of aerobic exercise on behavioural measures of reward processing and decision-making in 40 sedentary adults (aged 18-50). The exercise intervention group will complete a 20-minute high-intensity interval session on spin bikes and the control group will participate in 20-minutes of gentle stretching. It is hypothesised that compared to the control condition, acute exercise will lead to increased levels of reward valuation, reward learning, response selection/inhibition indexed via the Value Modulated Attentional Capture and the Stop Signal gamified cognitive tasks. Analysis will be conducted primarily using mixed-model Analysis of Variance and post-hoc tests to compare groups over 3-time points, baseline, 10-minutes post-intervention, and 60-minutes post-intervention. This study's outcomes could provide significant preliminary findings to inform the specific and personalised exercise parameters required for more accessible, personalised and neurocognitive-targeted treatment methods for addictive-compulsive illnesses and wellness programs more broadly.

Session 4A - The Brain

Maria Petraki

Monash University, Clayton Campus

Targeting the inflammasome: the key to treating perinatal brain injury?

Background: Neuroinflammation in the neonatal brain can lead to cerebral palsy. The inflammasome is a key signalling platform which matures pro-inflammatory cytokines into their bioactive forms.

Aim/Hypothesis: My current project aimed to explore the therapeutic efficacy of an inflammasome inhibitor, MCC950. I hypothesised that inhibition of the inflammasome following neonatal hypoxic ischemic (HI) brain injury would reduce neuroinflammation, neuropathology and improve behaviour.

Methods: Postnatal day 10 rats underwent surgery, followed by hypoxia. At 6 and 24 hours post HI, pups received MCC950 or saline via intranasal route. Behavioural testing was performed at 24 and 72 hours and rats were then culled and brains collected. Immunohistochemistry and qRT-PCR were performed.

Results: HI impaired motor control ($p=0.0027$), reduced brain weight ($p0.0001$), body weight ($p0.0001$), and increased left hemisphere tissue loss ($p0.0001$) compared to sham and MCC950 did not alter these parameters. HI decreased neurons ($p0.0001$), increased microglial activation ($p0.0001$), cell death ($p0.0001$), IL-1 β ($p0.0001$) and astrocyte activation ($p0.0001$) compared to sham and MCC950 had no effect on these outcomes. HI increased NLRP3 ($p=0.0086$), IL-1 β ($p=0.046$), IL-18 ($p=0.0142$), Caspase-1 ($p=0.0152$), Caspase-11 ($p=0.0376$) and Gasdermin-D ($p=0.0046$) expression compared to sham. MCC950 reduced IL-18 ($p=0.0303$) and Caspase-1 ($p=0.064$) showed a trend towards reduction compared to HI+vehicle. **Conclusions:** The inflammasome pathway is activated following neonatal brain injury and MCC950 6 and 24 hours post injury was not effective in reducing neuropathology, but had an effect on gene expression. Further research into different timing and dosing of MCC950 as a therapy for neonatal brain injury is warranted.

Session 4A - The Brain

Ho Yan Yi

Nanyang Technological University, Singapore

Spiking Neural Networks: The next frontier of machine learning

While machine learning is poised to revolutionise the world of commerce and science, its implementation is still plagued by issues of high energy consumption and prolonged training time. Currently, widely used machine learning models such as LSTM and RNN rely on the backpropagation error algorithms and can be said to learn through brute force. This could soon change however, with the advent of 3rd generation neural networks-Spiking Neural Network(SNN). Combining neurology and computer science, the SNN is a sophisticated machine learning architecture mimicking the functions of the human brain. It demonstrates an impressive capacity for unsupervised learning, through use of biologically plausible mechanism such as Spike Timing Dependent Plasticity and lateral inhibition. This research paper aims to not only study the distinguishing features of SNN but optimise its efficiency and compare it against the benchmark set by traditional machine learning models. We first implemented a SNN model, by adopting a script developed by pre-existing research and training the SNN to perform digit recognition using the MNIST dataset. Following this, we conducted experiments to determine the relationship between the model's train and test accuracy, and the number of neurons, training samples and epochs used respectively. Finally, application of SNN to improve Self-Organising Maps was explored.

Session 4B - Climate Change & Pollution

Sarah Sullivan

Monash University, Clayton Campus

The large-scale solar revolution: environmental and social implications for regional communities

This research will explore how the implementation of large-scale solar projects need to consider certain social licensing issues, in order to adopt a holistic viewpoint to address greenhouse gas emissions. Failure to act on legislative targets and respond to community concerns in regional areas can lead to ecological issues like The Heat-Island Effect; this refers to heat being absorbed back into soil shrubbery after being reflected from solar panels and damaging minerals. Additionally, these issues include the mis-use of agricultural land, as well as technical problems like transporting energy through infrastructure from regional areas to suburban locations. In terms of my methodology, I be collecting data from academic publications such as Ecogeneration and Scientific Journals, as well as various Australian government reports and conducting a Literature Review. This aims to provide greater understanding of the complexities of renewable sources and their impact on existing natural features. This research will focus its discussion around biodiversity and energy capacity issues in the era of climate change urgency. This is demonstrated by the Victorian Government's commitment to the Victorian Renewable Energy Target, which legislates that by 2020 25% of electricity from the grid will be powered by renewable energy sources. Moving forward, it is imperative that the major players in the clean energy industry, including developers and financiers, need to co-operate together effectively, as fierce debate still lingers surrounding a post-2020 climate policy culture. Therefore, these technologies should be utilized efficiently, however identification of potential consequences is important towards establishing long-term environmental usage.

Session 4B - Climate Change & Pollution

Juline Lew Yun Yee

Nanyang Technological University, Singapore

Perception Makes Reality: Cross-Country Analysis Comparing Factors Influencing Risk Perception of Nuclear Energy

Climate change has intensified the search for alternative energy sources. Recently, some countries have shown interest in implementing nuclear energy, in what has been dubbed a “nuclear renaissance”. Yet, risk perception plays a role in influencing public support of nuclear energy. In this present study, we apply the cognitive miser model as the key theoretical framework to understand the factors influencing risk perception of nuclear energy in Indonesia and Singapore. Using data collected from nationally representative door-to-door surveys of 1,000 respondents from Indonesia and 1,000 respondents from Singapore, this study investigates the effects of value predisposition, media attention, reflective integration, and knowledge on the risk perception of nuclear energy. The findings revealed that in both countries, affect was negatively associated with risk perception while subjective knowledge was positively associated with risk perception. Additionally, in Indonesia, trust in government, trust in non-profit environmental organisations, attention to TV news, elaborative processing, and contextual knowledge were significant predictors of risk perception. Conversely, in Singapore, risk perception was positively associated with trust in business leaders and content knowledge, and negatively associated with trust in international institutions. Interpersonal discussion and elaborative processing were found to moderate the effects on risk perception. In both countries, lower attention to online news indicated higher risk perception for those who engage in less interpersonal discussion, while the effect reverses for those who have higher engagement in interpersonal discussion. We concluded the study with a discussion of the theoretical and practical implications. Keywords: risk perception, nuclear energy, cognitive miser model

Session 4B - Climate Change & Pollution

Manimaran Sonali

Nanyang Technological University, Singapore

What is the value of nature in tropical coastal cities? Systematic literature review of cultural ecosystem services in the urban tropics

Nature performs various functions that accrue numerous benefits – ecosystem services – to human beings. Measuring these benefits is an effective way to ensure that natural resources are protected or managed for sustainable usage. Studying cultural ecosystem services (CES) allows for the evaluation of how ecosystems provide recreational, spiritual, educational and other cultural opportunities to humans. CES are a growing, but still largely understudied area of research, particularly in tropical coasts. It is therefore imperative to assess the state of knowledge of tropical CES so as to (1) summarise the values of various CES in coastal ecosystems, (2) identify trends in CES studies and (3) highlight existing research gaps. This study performs a systematic literature review of CES in tropical coasts, in which both explicit CES studies and other relevant studies (not framed as a CES study) were analysed. Through the review, more than 60 papers were analysed qualitatively and quantitatively. Tourism and recreation were the services that were most studied, with majority of studies taking the form of economic valuation, using many different and even novel methods. Studies were also most often conducted in Southeast Asia and on coral reefs. Many studies have some management, conservation or policy objectives associated with their research as well. CES studies also frequently discuss the effect of user preferences on valuation outcomes. This review also highlights various other trends as well as some limitations of current CES studies and compares the extracted values of CES. Keywords: ecosystem services, tropics, coast, cultural services, valuation,

Dangi Siddharth Hasitkumar

Nanyang Technological University, Singapore

SYNTHESIS OF SELF DEGRADABLE PLASTICS

Plastic pollution is a serious problem that our world faces. 3 trillion plastic bags are manufactured every year round the globe, but only 1% of them are actually recycled. This statistics is enough to show our dependence on plastic bags and plastics. We need to find out a way to remove all the plastic waste lying in our environment. Plastics take hundreds of years to degrade naturally. So the question is “Is there a way to increase the rate of degradation of plastics by changing its chemical structure?” And the answer to it is photo-catalysis. When light of sufficient energy strikes the photo catalysts (metals having small band gap), it leads to electron-hole pair separation which catalyses the subsequent reaction. The objective of this research is to study the properties of photo-catalysts and find methods to integrate it within the plastic structure that leads to self-degradation in presence of radiation. The photo-catalysts used in this experiments are TNPs(Titanium Nano Particles) made using flame synthesis method. The integration of TNPs is done by two processes: 1. Dissolving in a solvent 2. Hot air blower method. The resulting material is irradiated with UV light for 100 h. The mass loss is recorded and degradation rate is calculated. Scanning Electron Microscopy (SEM) is used to investigate changes at molecular levels and predict the structure of the plastic after irradiation. The half life of plastic is used as a parameter to compare between the efficiency of the photo-catalyst.

Sharon Chan Pei Yi

Nanyang Technological University, Singapore

Genomic Profile of Novel Variants of *Acinetobacter baumannii* Genomic Resistance Island 2

Multidrug-resistant *Acinetobacter baumannii* belonging to the global clone (GC) 2 has been increasingly associated with nosocomial outbreaks that greatly limits therapeutic options. Mobile genetic elements that harbour multiple resistance determinants have been characterised to reveal a wide array of genomic resistance island (GRI) profiles for *A. baumannii* isolates. AbGRI2 was definitively established in 2013 to distinguish it from the GRIs found in comM and Tn6167. However, rapid and frequent gene turnover often results in novel and significant genetic variability across isolates, henceforth subjecting the structure and phylogeny of AbGRI2 to considerable deviations. Although many variants have previously been detected, little is known about how the global pool of AbGRI2 isolates has evolved over the last few decades. By performing bioinformatics and in-silico analysis using public database, we examine the structure and context of at least 20 novel variants of AbGRI2 in global isolates. We found that all isolates carry the *sul1-qacEΔ1-aadA1-orfQ-orfP* cassette array and *intl1-tnpM* genes in the integron-containing segment, flanked by the *bla*TEM gene, *aphA1b* gene or other mobile elements. This indicates that AbGRI2 plays a critical role in aminoglycoside and sulphonamide resistance which enhances its pathogenic potential. Moreover, the variants were observed in isolates from Australia, China and the United States indicating its capacity for globalisation. As an extension to determine their evolutionary lineages, a phylogenetic tree was constructed with Kalign. Overall our results revealed the genomic profiles of novel AbGRI2 variants and demonstrated the utility of genomic analysis to study alternative forms of GRIs.

Yukiko Horne-Okano

Monash University, Clayton Campus

CHANGES IN AORTIC STIFFNESS IN HAEMATOLOGICAL CANCER PATIENTS FOLLOWING ALLOGENEIC STEM CELL TRANSPLANTATION

With the exception of cancerous complications, cardiovascular disease (CVD) is the primary cause of death in haematological cancer survivors, primarily due to the many risk factors these conditions share. Observing vascular health is valuable in monitoring subtle changes in cardiovascular function and subclinical CVD in an acute setting. This study aims to determine the effect of allogeneic SCT on aortic stiffness in acute haematological cancer patients, and subsequently compare compliance with age and sex-matched time controls. We hypothesise that aortic stiffness will increase post-transplant in acute patients, and that they will also display greater stiffness than healthy controls. Aortic stiffness was measured via MRI by looking at the mechanical distension of the artery. Secondary cardiovascular measurements included cardiorespiratory fitness (VO₂ max test), left ventricular function (MRI) and blood pressure. Testing occurred prior to transplant, and approximately three months post-transplant in acute patients. In control subjects, there will be a three-month interval between testing. A paired t-test will analyse pre-and post-data in acute groups, and an ANCOVA will compare the acute group to the controls, taking into account relevant covariates from secondary data. 26 acute haematological cancer patients (ages 19-71, 65% male, five deceased) undergoing allogeneic SCT have been recruited, and all baseline data has been collected. This cohort has been age-and-sex-matched to healthy controls for comparison, for which data collection is near completion. Recruitment is complete, with current progress focussing on collecting follow-up data and data analysis, which will be complete by September.

Augustine Koh Jing Jie

Nanyang Technological University, Singapore

The role of membrane vesicles in horizontal gene transfer in *Enterococcus faecalis*.

Enterococcus faecalis (*E. faecalis*) is a commensal gram-positive bacterium residing in the gastrointestinal tract, but also an opportunistic pathogen responsible for urinary tract infections, bacteremia, wound infections and endocarditis. Such infections caused by *E. faecalis* is very difficult to treat due to resistance to multiple antibiotics. Multidrug resistance arise due to chromosomal gene mutations, as well as horizontal gene transfer (HGT) of plasmids or DNA fragments within and between bacterial species. Other than transformation, transduction and conjugation, some bacterial species utilize membrane vesicles (MVs) for HGT. In this research, the objective is to address whether MVs could be an alternative mode of HGT of plasmids employed by *E. faecalis*. MVs from *E. faecalis* with plasmid were isolated, purified and subsequently added to recipient *E. faecalis* and *E. coli* (without plasmid) for plating on kanamycin agars and CFU enumeration. According to our experimental results, we concluded that *E. faecalis* is unable to pack plasmids inside MVs for HGT to recipient bacteria, due to absence of kanamycin-resistant colonies as well as the absence of plasmid bands from the MV samples (post DNase-treatment) isolated from OG1RF with pMini in the gel image.

Session 4C - The Body

Wendi Huang, Esma Fazlic & Christine Huynh

Monash University, Clayton Campus

A Gender Comparative Analysis: How HPV Vaccination Impacts Sexual Practices

Although existing vaccines have been developed against nine types of Human Papillomavirus Virus (HPV), they are unable to protect against other types of HPV which can cause not only cervical cancer, but also anal, head and throat cancers. Therefore, the continuance of safe sexual practices provides vital protection and prevention of HPV related illnesses not covered by the HPV vaccine, as well as other STIs. Previous research is neither sufficient nor conclusive in regards to whether HPV vaccination uptake correlates with changes leading to risky sexual behaviours. Moreover, services, information and previous research on male HPV-related issues are significantly lacking compared to those focusing on women. The impact of vaccination on male sexual behaviours within Australia is completely absent. This is concerning, as HPV is commonly considered a feminized disease despite the equal roles and responsibilities men have in transmission and protection against HPV, which appear less prominently. The study has two aims: firstly, to conduct a gender comparative analysis on how HPV vaccination status influences decisions to engage in safe sexual behaviours among Monash students. Secondly, to also include a feminist bioethical perspective into the public health studies of safe sexual practices. Two questionnaires will examine attitudes and past behaviours towards risky sexual practices. Results will be analysed to indicate the direction of findings and for any gender differences. Our research will address this grave literature gap within male-related HPV research and increase visibility within the research community pertaining to the gender disparity of sexual responsibility.

Session 4D - Sustainability & Environment

Tanvi Oza

Monash University, Clayton Campus

Sugarcane runoff into the Great Barrier Reef: An approach to accelerating on-ground management

Coastal and marine degradation is a significant issue worldwide and is continuing to be exacerbated by anthropogenic and climatic stressors. In Australia, there has been focus on the export of terrestrial pollutants from sugarcane farming into the Great Barrier Reef (GBR), and contributing to its degradation.

Despite introducing numerous regulatory and incentive-based initiatives to minimize nutrient runoff into the GBR, water quality continues to be of low quality and current management responses are not effectively solving the issue. Therefore, there is an urgent need to accelerate on-ground management through additional levels of protection to safeguard its future.

Coastal wetlands are known to provide a plethora of ecosystem services including filtering terrestrial runoff. The restoration of wetlands offers a significant opportunity to protect the GBR, given appropriate quantification of their services, and the development of effective incentive-based programs for land-holders.

This research focuses on evaluating the effectiveness of wetlands in trapping runoff from sugarcane farms; and assessing farmer attitudes towards implementing wetlands into policy. Environmental DNA can provide information on sediment provenance in wetlands, thereby assessing their effectiveness in trapping runoff. When combined with interviewing farmers to assess perceptions of cost, convenience, future threats to their business, and willingness to manage wetlands on their land; policies for tidal wetlands as additional protective measures for the GBR lagoon may be developed. Given the threat of future erosion, sea-level rise and increased runoff into the GBR, research in this area is timely, cutting-edge and aims to provide holistic policy recommendations to stakeholders.

Session 4D - Sustainability & Environment

Ayesha Ali

Monash University, Clayton Campus

An Alternate to Concrete

Concrete has been used by humans for a long time; after water, it is the second-most utilised substance on Earth. It is used globally in basic infrastructures like bridges, roads, runways and dams. The main ingredient of concrete is cement. Its production grows by 2.5 % annually and is expected to increase from 2.55 billion tons in 2006 to 3.7-4.4 billion tons by 2050. However, for every ton of cement produced, 1.25 tonnes of CO₂ are released into the atmosphere. Global cement production accounts for more than 1.6 — 10 tonnes of CO₂ discharges from all human activities. In contrast, hempcrete is a bio-composite made of the inward woody part of the hemp plant mixed with a lime-based binder. It is a carbon negative material: the hemp crop takes in CO₂ while it grows which, in turn, is stored in the hempcrete block throughout its lifetime. The purpose of this research paper is to compare the properties of hempcrete with concrete and to see if the former performs better than the latter in terms of sustainability, structural strength and commercial viability. To do my research I have completed a meta-analysis of various research papers and journals. I argue that hempcrete cannot be used alone as a structural material; for it to be commercially viable it would need to be used in conjunction with and must be used with a load-bearing structure like timber. However, it is expected to cost more than concrete as its cultivation is illegal in many places.

Session 4D - Sustainability & Environment

Zoe Evans

Monash University, Clayton Campus

Developing a tool for analysing and improving the behavioural and educational outcomes of citizen science and conservation endeavors

It is generally assumed that participation in citizen science or conservation endeavours will generate an increase in understanding of the issue, and environmentally significant behaviour on the part of the individual. However, this is largely not borne out by what little analytical data exists. As things stand, it is very difficult to find and analyse multiple case studies simultaneously, as no consistent method of data collection or analysis exists. Consequently, it is difficult to develop a strategy to ameliorate the lack of impact on individual behaviour and understanding generated.

A wide-ranging literature review has been employed in order to determine which methodologies are most promising for analysing the above problems. The literature to be examined will include scientific and behavioural pedagogy, theories of environmentally significant action & participation, and research concerning citizen science initiatives. This is with a view to developing an assessment tool which can be refined through application to extant case studies. Eventually this tool will be applied to an active conservation endeavour in order to refine it and test its suitability in ongoing program development.

This research aims to generate a framework in which participation-based initiatives can be developed to better meet certain goals. Those goals being ameliorating environmental understanding and environmentally positive behaviour in the populace.

Through the development of this research, it is proposed that it will be possible to develop a more coherent method for producing and assessing education and behavioural outcomes from citizen science and conservation.

Session 5A - Connecting Cultures

Ella Ballerini

Monash University, Clayton Campus

The transformation of Rwanda: Post-genocide reconstruction, reconciliation and national healing

Post-conflict states aim to achieve reconciliation between divided racial, ethnic, religious or other social groups. The 1994 Rwandan Genocide against the Tutsi resulted in the deaths of more than 800,000 Tutsis and moderate Hutus; leading to the destruction of the social fabric of the nation. In its aftermath, the Rwandan government quickly embarked on an ambitious program of reconciling a nation divided between the two major ethnic groups.

The purpose of this study is to examine the efficacy of Rwanda's approach to reconciliation as a tool for nation-building. Three key mechanisms adopted by the Rwandan state to achieve this aim were identified and analysed. These include the traditional judicial system of Gacaca courts, social reconstruction through community-based programs and the introduction of economic policies to drive development.

It was hypothesised that this dynamic combination of both 'top-down' state-driven and participatory community-based approaches, would be effective in driving reconciliation. It was found that these mechanisms have largely contributed to the restoration of social bonds between fragmented communities. However, continuing tensions exist due to unresolved prosecutions.

There is much to be gained from the case of Rwanda for other post-conflict societies. This study has shown that some of these mechanisms are likely to be applicable in other post-conflict states if adapted to the contextual situation. The case of Rwanda is therefore an insightful example of the potential avenues for reconciliation in the broader field of post-conflict peacebuilding and development.

Session 5A - Connecting Cultures

Joanna Cookson

Monash University, Clayton Campus

Burying the Past: The Impact of the 2018 Memory Law on the Historiography of Anti-Jewish Violence in Poland

More than 70 years after World War II ended, Holocaust remembrance remains controversial in Poland. The 2018 amendment to the 1998 Act on the Institute of National Remembrance Commission for the Prosecution of Crimes Against the Polish Nation (IPN Act) generated global controversy amid concerns that it will perpetuate a monolithic narrative of Polish heroism and victimhood in preference to acknowledging Poland's dark past and promoting reconciliation between all sectors of Polish society. This research project will explore the extent to which Poland's so-called 'memory law' is likely to stifle academic debate on the legacy of anti-Semitism and Polish participation in anti-Jewish violence during World War II. A case study of the Jedwabne massacre a crime perpetrated by Polish citizens against their Jewish neighbours that was attributed to German forces even into the twenty-first century will provide an illustration of anti-Jewish violence with a contested historiography, and a close analysis of the drafting of Article 55a of the IPN Act will demonstrate key barriers the memory law poses for academic freedom in Poland. An examination of scholarly literature on the Jedwabne massacre will reveal the deep fissures in academic and public discourse on anti-Jewish violence on Poland, which will be re-examined in the context of memory law scholarship and Article 55a. Notably, findings from the literature review will be contextualised by reference to the Polish government's current platform of historical revisionism and memory politics, revealing the menacing effect of the memory law in deterring historical debate.

Session 5A - Connecting Cultures

Pawel Malys

University Of Warwick

Poland's social policy: a product of the Sunday Mass(es)?

Whilst religion remains a contested area of debate for social scientists, there is overwhelming evidence pointing to a decreasing importance of religion in formulating policy. Indeed, religion has lost the argument against modernisation in many Western countries, with many states, such as France, regarding it as a private matter, ergo playing no role in policy. Poland, on the other hand, serves as a strong anomaly to this tendency. Research estimates that as many as 95% of Poles declare themselves to be Catholic. The political impact of Catholicism has been well-noted by scholars working in this area, and this appears to be evidenced and further supported recent moves by the governing party to issue generous financial support to families with children, as well as moves to further harden the law aimed to restrict abortion, while the continued hostilities towards LGBT+ groups are symptomatic of the deep influence of religious teachings on the worldviews of Poles.

This project will analyse the attitudes of policy-makers and the general public on the role of religion and social policy. To do this, I will conduct a series of interviews with members of the general public and Polish political figures (including MPs and, if possible, members of the Polish government) to ascertain their views on role of religion in politics. In so doing, the project will make a valuable contribution to normative debates around the merits of secularism and will provide a lens into the development of secularisation in the Polish case.

Session 5A - Connecting Cultures

Gaya Raddadi

University Of Warwick

Constructing Memory in France and Tunisia - A Comparative Study on Nation-building and Cultural Identity

The aim of this project is to analyse the connection between art and building of national identity. For this purpose, a comparative study will be presented on the Louvre (France) and the Bardo National Museum (Tunisia). The Louvre is an emblematic legacy of the Age of the Enlightenment, while the Bardo National Museum was founded by French representatives when Tunisia was still a French Protectorate.

Firstly, the philosophical and political framework will be considered in favour of analysing the museum as locus of power, tool of creation of a collective memory, national identity, state legitimacy. To contextualise this analysis, the framework provided will be applied to the chosen case studies. Reflections on the Louvre will encompass its shift from a royal palace to symbol of the French Revolution, to the acquisition of its modern significance as depository of France's national patrimony and its performative role in the projection of France's grandeur during the Napoleonic era. Meanwhile, the analysis of the Bardo National Museum as depository of history and cultural identity will take place in the context of Tunisia first as a French Protectorate, and its transition to an independent state. Comparing and contrasting the two institutions allows us to analyse the role of national museums in both a European and non-European context.

In conclusion, this research aims at arguing that regardless of contextual differences, the importance of museums for the construction of national identity in non-European contexts are on par with the European experience.

Nicholas Wei How Tham

Monash University, Clayton Campus

Microplastics pollution: An emerging threat to terrestrial ecosystems

Plastic pollution represents a huge threat to the environment, especially in the form of tiny pieces of plastics known as microplastics (5mm). There has been extensive research on the impact of microplastics on marine ecosystems in the past decade, however, the presence of microplastics on terrestrial ecosystems, particularly farmlands, and the corresponding consequences have been overlooked. Globally, significant amounts of microplastics have been found in agricultural lands, introduced via the use of biosolids as organic fertilisers. According to research in the *Science of the Total Environment* journal, 2,800 19,000 tonnes of microplastics are added to Australian farmland each year through biosolids. This presence of microplastics could lead to broad changes in agricultural landscapes such as changes to soil nutrients. This research uses recent academic literature to determine the impact of interactions between microplastics and terrestrial organisms in farmlands. In particular, it will focus on the interactions between microplastics and soil-based ecosystems including organisms such as earthworm and terrestrial fungi and how this reduces farm productivity. The implication of this research aims to understand the impacts of microplastics on agricultural farmlands and raise awareness for researchers to have an equal focus on both land and ocean when considering microplastics, as well as determining ways to reduce and mitigate the microplastic pollution. This knowledge will flow onto the agricultural community and assist farmers in maximising their crop productivity by being aware of the potential side-effects of using biosolids as fertilisers.

Gemma Mitchell

University Of Leeds

Thin film lubrication of non-conformal geometries

Elastohydrodynamic lubrication is a mode of lubrication typically found in mechanical components like gears, roller bearings and cam-follower mechanisms. It is desirable to effectively lubricate these surfaces and interfaces within tribological contacts. This research focuses on recommissioning existing equipment and developing new methodologies to optically measure thin film lubrication at rolling/sliding interfaces.

In many industrial applications appropriate lubrication is necessary to prevent unnecessary wear of machine elements. However, in many components they do not have smooth surfaces, leading to loads being applied over very small contact areas. Many mathematical models currently assume a smooth surface, the consideration of asperities is important to give a closer physical representation and analysis of contact. Through the recommissioning of this equipment and development of methodologies future research may be feasible to contribute to the understanding of how rough surfaces affect thin film lubrication.

The analysis of previous experimental methods has determined the functions of different parts of the equipment and realisation of parts which are missing. It has been discovered the hard drive, which controlled the equipment and analysed interferograms taken, crashed and has been removed. The project has now adapted to researching how functioning machine elements can be integrated with modern software and cameras to control moving elements and capture images of the contact area. A MATLAB code may be developed in this or future research and combined with optical colorimetry techniques to analyse the interferograms and determine film thickness, along with the effect of surface asperities.

Victor Covasan

University Of Sheffield

Spatial Scales of Collisionless Shock Ramps Observed by the NASA MMS Mission

The scale of the transition region in collisionless shocks is one of the core parameters defining the nature of the discontinuity since it is correlated with the relative influence of dispersive or dissipative effects in balancing the nonlinearities leading to the formation of the shock itself. It is therefore fundamental to understand the ways in which the interplay of these two entropy-generating processes evolves with changes in the propagation speed of the discontinuity to be able to verify the validity of current models describing the dynamics of shock ramps. Similar investigations have attempted to quantify these relationships based on the data provided by Cluster and THEMIS however they have been constrained by aspects such as large spacecraft separation or relatively low resolution of the fluxgate magnetometer measurements. This prompted the requirement to reconsider the problem of ramp scales in collisionless shocks. The more recent NASA MMS mission provides capabilities that rectify the two limitations by delivering a much higher sampling rate as well as a satellite separation up to ten times smaller. Over one hundred shocks were analysed, sampled randomly over the second phase of the mission and the data was processed using variance analysis methods and four-satellite timing for the construction of the boundary normal. The results showed a strong dependence of the ramp scale on Alfvénic Mach Number (MA), for low MA the ramp scale corresponding to the dispersion scale (c/ω_{pe}), while for increasing MA the scale was found to approach a few c/ω_{pe} .

Session 5B - Space

Eduardo Enamorado

University Of Durham

Analysing the Development of EU Outer Space Policy

The space sector provides over 230,000 jobs in the EU, and it is worth between 46-54 billion Euros to the EU economy. Space has indeed become a global business yet today the European space industry faces substantial competition from America, India, China and Russia.

EU intervention in space, together with those of its Member States and the European Space Agency, needs to aim to strengthen the European space industry's competitiveness at a global level. However, in order to determine how to strengthen the European space industry, it is crucial to understand the current EU space policy and how it has developed over time.

The main academic question focuses on understanding how the EU has failed or succeeded in developing stable strategies and new technologies to promote a substantial industrial base for outer space applications and services. There is however a set of sub-questions that are raised by the research project.

Is there a coherent and stable set of provisions / a framework? When and how it developed?

How has the EU supported the global competitiveness of the European space industry?

Describe the development of different markets for space applications and services.

Has Europe become more technologically independent to access space?

Without being aware of it, European citizens rely on outer space technologies when they use their mobile phones, do financial transactions, take an aeroplane, watch the weather forecast or look for the nearest restaurant. Space has become part of modern times and could become a more substantial part of our future.

Beverly Chee

Monash University, Clayton Campus

Regression or progression: vaccinations

Vaccinations are listed as one of the major public health achievements of humankind and have been used to eradicate and prevent infectious diseases such as measles and polio. Vaccines are important because they prevent and protect vulnerable populations, for instance, babies, from diseases. Most countries have implemented policies and legislation to ensure residents receive their required vaccinations, for instance, through immunisation schedules. Up until the last 20 years, most people have followed the prescribed vaccination schedules. However, during the last few years, many developed countries such as the United States and Australia have experienced vaccination boycotts and anti-vaccination sentiments. This study reviews recent literature on disease epidemics to determine the impact of the anti-vaccination movement on public health in developed countries. This study has found that anti-vaccination movements have regressed public health and increased the rate of disease in developed countries, particularly in affluent communities. This is evidenced by a news report citing that a large-scale measles outbreak impacting 695 people as of April 24, 2019, is the highest in 20 years in the United States. This review aims to ascertain the impacts of the anti-vaccination movement and inform policymakers, so they are able to design tailored education programs and community efforts to raise awareness about the legitimacy of vaccines and the dangers associated with the anti-vaccination movement.

Laura Woodbridge

Monash University, Clayton Campus

Reluctant governments, vulnerable claimants: Evaluating redress schemes for historical crimes, wrongdoing and injury

As governments, organisations, and institutions around the world move to apologise for and respond to historical wrongs, there is a corresponding push towards providing compensation to those affected and/or their descendants. Compensation may be provided outside of the courts, through an executive or legislative framework, or in schemes set up by non-government organisations. The success of these schemes, and their reception by claimants, vary.

This paper will assess a range of compensation schemes, both around Australia and internationally. This comparison will inform conclusions about the strengths and weaknesses of these redress schemes from the perspective of claimants, who are often vulnerable and have particular needs that depend upon the unique nature of the historical wrong or injury that requires redress. In particular, the structure of redress schemes, whether payments should be ex gratia, deeds of release, evidentiary requirements, and the process of assessment are considered. The ways in which governments and institutions may work to limit their liability to claimants in the context of redress schemes, and the impacts this has upon claimants, are considered.

Victims and survivors of past crimes, harms, and wrongdoings increasingly come forward to request compensation, and governments and institutions are increasingly willing to provide it. This comparative evaluation of redress schemes around the world will therefore contribute to the literature on the development of best-practice models especially those based in restorative justice which are fully sensitive to the issues at play in compensating for historical wrongs.

Jacqueline Zhu

Monash University, Clayton Campus

Blocked Ears: The Misguiding Effects of Forensic Audio Enhancing and Transcription on Juries' Perception

Audio recordings permitted as forensic evidence in court should ideally be clear and audible to enable juries to make informed decisions. However, in many situations, recordings are usually of poor quality and difficult for the normal person to discern what is being said. To overcome this issue, audio enhancing is employed, and parties present their own version of transcripts in an attempt to influence the jury's perception. While the original audio recording serves as the evidence, enhancing and transcribing techniques primes listeners to adopt their own contextual expectations. As a result, juries are misled as to the content of covert recordings because of their false beliefs surrounding enhanced audio and transcript reliability.

This research aims to review the current literature on forensic audio and the methods of ascertaining the content of these recordings following Dr Helen Fraser's 'call to action'. There is a particular focus on Australian courts, however other jurisdictions and their practices for using audio recordings will be used as a comparison. Interviews with Dean Catoggio, forensic audio analyst and General Manager at the National Institute of Forensic Science, will be used to assess the current situation and investigate the interpretation of audio in court.

Consequently, the inadequacies of audio recordings as evidence will be addressed to highlight the misconceptions surrounding enhanced audio, transcription and the interaction between the two when influencing juries. This may call for mitigation of these risks in audio evidence before they are ultimately presented at trial before a jury.

Nyasha Musundire

IIE MSA

The Social Science of Human Organ Trade

There is a global shortage of organs available for transplantation, from the long waiting lists to no chances of survival (National Kidney Foundation,2019). While most investigations have shown that the poorer are more inclined to organ trading because they are mostly in need of money, some philosophical researchers have highlighted on the ethics of organ sale (Greenberg,2013). However, there appears to be less focus on the wider issues arising from people involved in organ trading through a donation/commercial purposes. This study is, therefore, intended to understand the cultural, socio-economic and political contexts of the transplantation trade and analyse the extent to which society is affected by these factors.

This study uses the system-based research design for literature review, whereby, other research studies are evaluated, secondary data collected and analysed and results from other studies are synthesized. The problems surrounding transplantation are then found to be greater than anticipated: i)the rise of criminal networks such as brokers, kidnappers and murders in the illegal trade of human organs; ii)the governmental/political involvement in organ trade (i.e.China and Iran).

Understanding the controversies related to the issue of organ trading, it is then recommended that, although safety legal measures are implemented, the risks should not be overlooked because human organs are an essential part to ones living. The study has made theoretical and practical contributions by suggesting innovate strategies: i)strengthening existing policies; ii)educating the public and governmental interventions of those at risk in black markets.

Raphael Morris

Monash University, Clayton Campus

Difference, Impairment, Disability: A Three-Part Model of Disability

What guides us in talking about disability? One principle is to foster positive social change and advocate for disability rights. Another is to give disabled people conceptual resources to make sense of their experiences. A third is to avoid pathologising benign differences and to celebrate diversity.

Existing models of disability cannot simultaneously fulfil all three purposes. The medical model pathologises difference and erases the social dimensions of disability, offering medical solutions to social problems (Shakespeare 2010). Although the social model of disability disentangles the individual and the social aspects, the nature of individual impairment remains a problem. If impairment is intrinsically negative, the model stigmatises difference (Tremain 2010). If impairment is not intrinsically negative, then it cannot explain the experiences of many disabled people (Crow 1992).

This paper offers a revisionary conceptual analysis of disability. My aim is a conception of disability that satisfies all three of the above reasons for discourse around disability. I argue that to do this we must distinguish three related concepts. Firstly, differences, which are traits that deviate from the statistical mean of a population. Secondly, impairments, which are traits that intrinsically lower quality of life. Thirdly, disabilities, which are traits that lower quality of life because of extrinsic social norms and practices that render society inaccessible to people with those traits. I propose a three-part model of disability that incorporates difference, impairment and disability as distinct components. The proposed model lays the foundations for a more inclusive, coherent and productive discourse around disability.

Tran Ngoc An Huynh

Monash University, Clayton Campus

The costs and outcomes of eosinophilic oesophagitis in Australia: data from a metropolitan hospital

Background: Eosinophilic oesophagitis (EoE) is a chronic, immune-mediated condition that is increasing in incidence and prevalence worldwide. This project sought to characterise outcomes and healthcare expense of the management of EoE in a tertiary referral service.

Methods: Patients diagnosed with EoE since 2011 were identified. Hospital cost data attributable to outpatient visits, endoscopies, treatment and hospitalisation were calculated.

Results: 64 patients (75% male, mean age 38.7 [range 15-81] years), with median follow-up 2.5 years were studied. 40/64 patients presented with food bolus obstruction as the index episode. Over the follow-up period, 45 patients required inpatient admissions for a mean period of 1.3 days. Food bolus impaction accounted for 95% of admissions.

Combined endoscopic, histologic, and clinical remission was achieved in 9 patients, after a median follow-up of 22 months. The median cost per patient attributable to EoE was \$9767, or \$3907 per patient year. Patients underwent a median of 4 endoscopies, which accounted for 73.6% of the total cost attributable to EoE. The median number of outpatient attendances per patient was 4.5.

Presentation ever with food bolus obstruction (incident in 53 [82.8%] patients) at any time significantly increased mean cost attributable to EoE (\$13413 vs \$9401, $p=0.01$).

Conclusions: EoE accounts for high healthcare utilisation and expense, predominantly accounted for by endoscopic procedures. With increasing incidence and prevalence of this condition, more effective therapeutic options sparing the need for endoscopies and reducing the risk of hospitalisation due to food bolus obstruction are required to minimise the healthcare burden of this condition.

Floriano Tori

Vrije Universiteit Brussel (VUB)

Entanglement Entropy Evolution in a Quantum Ising Spin Chain with Longitudinal and Transversal Magnetic Field

Quantum mechanics is the physics that describes the world on the scales of atoms and smaller. One fundamental property predicted by quantum mechanics is entanglement. If two particles are entangled, then a measurement performed on one of them will influence the result of the same measurement on the other, even if the particles are far apart. For general systems, entanglement entropy is introduced to quantify how entangled a system is. A more entangled system will have a higher entanglement entropy.

In this work, the evolution of this entropy is studied in a specific system which is a chain of interacting particles on fixed positions subjected to two magnetic fields. A non-entangled state of the chain can, if evolved over time under specific conditions, turn into a state that is entangled. First, this work presents the theoretical background needed to study entanglement. Subsequently, the results obtained in a previous paper describing this system were reproduced. Finally, different effects on the evolution were analyzed. Changing for example the magnetic fields present was found to influence the growth of entanglement of the system. The studying of the system was performed numerically.

Evolution of entanglement entropy has applications in different fields. Water will, when the temperature is decreased below a certain point, change its properties by turning into ice. This effect of a system changing its properties can also occur when other parameters than temperature are changed. Entanglement entropy can give insights into how systems behave as they are about to undergo a transition.

Session 5D- New Perspectives in Health Care & Physics

Terhi Kangas

Vrije Universiteit Brussel (VUB)

Continuous Glucose Monitoring: Patients' Empowerment and Self-care Agency

Modern technologies are increasing availability and significance in healthcare. Self-care apps are promoting what sociological literature has come to call “positive medicalization” by offering individuals the possibility to reclaim the agency in their own care. Traditional consultation visits are moving towards a “health care to-go” model. One specific case where health technology has been prominent is Type 1 Diabetes treatment.

Session 6A - Identities, Gender & Social Inequality

Michael Walton

Monash University, Clayton Campus

The Queerest of Them All: The Grimm's Little Red Riding Hood:

In recent years, the fairy-tale has been experiencing a revival with every year producing new adaptations and imaginings of canonical tales. These reimaginings, such as "Snow White and the Huntsmen", often superficially update the heteropatriarchal politics of the source tale with the aim to create a more palatable version of the tale for today's audience. Yet, implicit in this idea is the assumption that the possibilities for fairy-tales to explore queer identities and ideas occurs only in contemporary culture, and must be imposed on the text.

However, as this paper will argue, the possibility for queer readings and the exploration of queer identity already exists within the fairy-tale tradition, even in the classically heteropatriarchal texts.

Through an examination of the Brothers Grimm's 1812 tale, "Little Red Riding Hood", which has entered our popular imagination as a tale about the socialisation of girls and their obedience to the paternal authority, this presentation will argue that queerness is part of the fabric of the tale, often challenging the dominate heteropatriarchal ideology. This, in turn, suggests that queer identities and possibilities have always existed, and been explored, within the fairy-tale tradition.

Session 6A - Identities, Gender & Social Inequality

Madeline Hunt

Monash University, Clayton Campus

From Britons to the Welsh: Perceptions of Identity in Twelfth-Century Wales

Cultural and national identity are important elements of understanding who we are as individuals and collectively, as a people. It was no different in the medieval period. This paper seeks to explore how the Welsh, as a people, identified, distinguished and differentiated themselves from their neighbouring 'nations' at the time of, before and after, the Norman conquest of Wales in the 1080s; and how the incoming Normans, as a foreign power, perceived them. This will be explored through the method of close textual comparison of two primary sources, the Welsh 'Chronicle of the Princes', which records the events which took place in the years between 680 and 1282; and Gerald of Wales' 'Description of Wales', written in 1194 from the perspective of the Normans. This research will provide an important contribution to the study of medieval British history addressing the lack of analysis of the way in which the Welsh, as well as the other native cultures of the British Isles, perceived themselves in the medieval period and how they were perceived by others cultures, such as the incoming Normans. This research attempts to address the gap in the literature regarding the identity of the Welsh at the time of and just after the Norman conquest of Wales in the 1080s.

Session 6A - Identities, Gender & Social Inequality

Jack Mitchell

University Of Warwick

The Gendered Implications of Early Modern Slavery in West Africa

The history of slavery is one that has been told within the scope of the European experience and as something exclusive to American history. This fundamentally underplays the African experience of the slave economy and fits into the wider misunderstanding of Africa as 'the dark continent'. This paper therefore intends to focus on the history of slavery with regards to the African experience, whilst also seeking to understand the specifically female experience of slavery. To achieve this I will investigate three areas; firstly by returning to primary sources from African witnesses of the slave trade, as well as documents that explore the gendering of slavery both in the Americas and Africa. These provide the facts of the slave trade, which have seldom been understood from the female perspective. Secondly, by reviewing current historiographical trends that elaborate on the deep demographic ramifications of population transfer in West Africa, this paper intends to demonstrate how slavery violently altered the structure of society and ultimately transformed the life of the West African women. Thirdly, by looking beyond the period of slavery itself, this paper will explore how slavery came to stunt the future of the region, by facilitating colonial expansion and oppression for centuries after. In doing this, the rarely understood gendered implications of slavery will contribute to the development of African women's history. My research will therefore help to decolonise the often Eurocentric understanding of the Slave Trade and help to form a dialogue on the lasting legacy of slavery itself.

Session 6A - Identities, Gender & Social Inequality

Lucy Mooring

University Of Warwick

There's Nowt As Queer As Folk (Understanding Queer women and Rural space)

I come from Rural North Yorkshire- our most famous saying is 'there's nowt as queer as folk' this means there's nothing as weird as people. But, growing up queer in the Rural North, it felt like I was even weirder than this and utterly alone. I wanted to research how queer women like myself have historically and continue to navigate rural space. I wanted to affirm to myself and others that queer history is everywhere and that queer people have always existed. To do this, I seek to interview other queer women who like myself have navigated the complexities of queerness and ruralness. Through questionnaires, and in-person interviews I want to give a voice to other queer women. This seems important because of the historical erasure of queer voices and history and because I wanted to look beyond my own experience. Many women such as myself were fortunate enough to navigate their sexuality with help from online friends and worlds- this is not the case for women of the past and I wanted to understand their journeys. My work will be based heavily on archival history, understanding queer space through a historical lens. I believe my work will demonstrate the contradictions of rural space- the enforced heterosexuality, absence of partners, conservative values but also the privacy and safety of their own space. I believe I will also affirm my main research strand which is that understanding queer history, space, and voices are necessary

Session 6B - Sustainability

Thomas Vasquez-Lee, Jennie Do & Pinithi Dahanayake

Monash University, Clayton Campus

Why aren't we recycling e-waste? : Investigating Monash University students'

The rapid proliferation of electrical and electronic waste (e-waste) in Australia is contributing to severe, worldwide environmental degradation (Caravanos, Clark, Fuller & Lambertson, 2011). University students are high users of technology due to the digitization of tertiary education, making them an ideal population to examine Australia's high per-capita e-waste output (Balde, Forti, Gray, Kuehr & Stegmann, 2017). We will investigate Monash University students' current e-waste recycling habits and perceptions, barriers to recycling, and their knowledge of the existing Mobile Muster e-waste recycling initiative on campus. Our methodology will consist of three parts. Firstly, we will ideally partner with Monash Buildings and Property department to attain data on the current usage of Mobile Muster collection points around Monash Clayton and Caulfield campus. Secondly, we will conduct face-to-face interviews with Monash students to identify their e-waste perceptions and barriers to recycling. Finally, an online survey will be distributed across the university to supplement interview findings. We hypothesize that e-waste recycling rates will be low amongst university students, the primary reason likely being lack of awareness. We will produce a poster campaign and collection point that are informed by our research to help overcome barriers to recycling. The knowledge we produce through our research will inform other organisations implementing successful sustainable e-waste management solutions. We will present at ICUR a literature review on current e-waste recycling habits and perceptions, a detailed research plan as well as preliminary results.

Alice Paine

University Of Leeds

Identification of Volcanic Ash in Great Britain: novel perceptions of global volcanism and modern risk assessment. Volcanic hazards aren't constrained to their country of origin. In 2010, Europe's aviation network suffered £1.1 billion of losses due to an eruption of Eyjafjallajökull volcano in Iceland. Geologically, this was not an exceptionally large incident. Following this, nations needed to recognize the poignant risk of volcanism in the future a risk set to increase alongside Europe's reliance on global interconnections. The question remains: is modern society prepared for future eruptions? To answer this, my study extracted and analysed sediment cores from a hitherto uninvestigated site in Northern England. Ash layers were frequently found, and high variance in particle shape/size/colour between layers implies a variety of eruption styles have the capacity to inundate this region.

Observed in conjunction with similar research conducted across Europe (Swindles et al. 2017), these findings raise poignant considerations for future hazard management. Recurrent identification of ash particles in spatially-unique sediments across Europe emphasizes how this region has been previously affected by volcanism, and inevitably will be again in the future. Yet, response policies formulated post-2010 will only be effective if events of equal or lesser magnitude than Eyjafjallajökull unfold (Parker, 2015). Studying historic eruptions can indicate their extent/frequency: aiding preparations for when larger, more destructive eruptions unfold. Political and infrastructural perceptions of volcanic risk must shift from 'prediction' to 'preparation', and a key driver for this will come from searching novel sites for evidence of volcanism. If cryptotephra deposits continue to be found in the NE, political initiative to develop effective future response measures will subsequently increase.

Mark Anis

University Of Sheffield

Insights into improving the temperature coefficient of capacitance (TCC) in Multi-layer Ceramic Capacitors (MLCCs)

A further study of Barium Titanate (BaTiO_3)-based MLCCs in an attempt to improve temperature coefficient of capacitance explores four different processing routes for 10% Ca-doping to achieve a composition of $\text{Ca}_{0.1}\text{Ba}_{0.9}\text{TiO}_3$ and how that affects the ferro-electric Curie Temperature (T_c) of the composition.

Processing routes are as follows 1-2: Preparing from raw powders with and without a calcination step, 3-4: Adding Calcium Carbonate (CaCO_3) and Titanium Oxide (TiO_2) raw powders to chemically stable Barium Titanate powder with and without a calcination step. Ball-mills were done for 20 hours with isopropanol as solvent to enhance mixing and reduce segregation.

Qualitative and quantitative X-ray diffraction results of both powders and pellets show necessary element combinations and identification of chemically reacted powders, showing good powder mixing and extent of reaction. Additionally, 500 LCR scans were taken at 1000, 10000, 100000, 250000 and 1000000 Hz from room temperature till 320 degrees Celsius

Tests show positive results for an increase in T_c from ~ 120 to ~ 150 degrees Celsius for some of the processing routes. The testing conditions are discussed more thoroughly as well as the difference in processing routes for the same composition. An in-depth analysis of the implications is given, and what this means for the different processing routes and the different ceramic pellet conditions. Core-shell microstructures are discussed and how they apply to this composition of BCT (Barium Calcium Titanate) A final conclusion of some of the new potential applications is covered, leaving an open-ended basis for future work on the topic.

Session 6B - Sustainability

Eleftherios Ioannou

University Of Sheffield

Arbor Low Neolithic henge monument in Augmented Reality

Arbor Low is a nationally-protected archaeological site and one of the most visited archaeological monuments in the Peak District, UK. The enclosure contains a stone circle with 50 limestone slabs, all now fallen. This project used Augmented Reality (AR) so that the stones can be viewed standing and interacted with in situ.

A low-resolution 3D model of the stones and landscape enclosure was used for optimal rendering speed on a smartphone. Rendering realism is enhanced by using photographs of each individual stone to colour the models of the stones and to create normal maps to give the impression of bumpy surfaces on the low-resolution 3D models. Transparency effects are used to blend the virtual models with the real world.

A graphical user interface allows the user to control which stones are standing or lying down in the AR view on the smartphone. Information 'hotspots' are virtually placed in different site locations to display educational information about the monument. The Unity real-time engine and AR Foundation were used for implementation so that the application could be deployed on both Android and Apple devices.

The resulting AR software will be used to support field trips for undergraduate students in the Department of Archaeology in the 2019/20 academic year. In addition, a further intention is that it will be available via online stores so that members of the public can use mobile devices to either display the site in their own homes or see the stones standing in situ.

Session 6C - Health & Performance

Ashling Morone

Monash University, Clayton Campus

Associations between weight-based stigma, psychological distress, and somatic symptomology

Experiences of stigma can have negative consequences for many aspects of an individual's life, including their mental and physical health. A growing body of research has looked to examine the relationship between weight-based stigma specifically, and any health effects.

The aim of the research is to establish the relationship between the experiences of weight stigma, psychological distress and somatic symptomology.

Using a cross-sectional research design, this study intends to conduct a secondary analysis of existing survey data that assessed weight-based stigma, psychological distress, somatic symptomology, and demographic characteristics. In total the survey had 581 participants, all of which were undergraduate university students. Statistical analyses will be conducted on the variables of weight-based stigma, psychological distress and somatic symptomology in order to establish the relationships between these variables.

While there is some research into the associations between weight-based stigma and health, this research project's further analysis can add to the greater pool of knowledge leading to a more comprehensive understanding of this issue. By better understanding the health consequences of weight-based stigma, there is a stronger impetus for policies to be developed that discourage such stigmatising behaviours.

Session 6C - Health & Performance

Marcus Voon

Monash University, Clayton Campus

Exploring the effect of time spent participating in sport, on academic performance in university students.

Most people have personal opinions on the effect of sports on academic performance. However, there is little attempt at deciphering the cost and benefit of each additional hour spent participating in sports. Consequently, university students must decide how much time to allocate to sports based on sub-optimal information. This research seeks to discover what the optimum number of hours spent on sport per week is, for the university student seeking to maximise his academic performance.

Ongoing research in the form of literature review suggests that students who have participated in sports generally outperform students who do not. This is attributed to factors such as increased determination, time management, self-confidence and stress relief. However, students at the top end of the spectrum, in terms of hours spent on sports, such as American NCAA Division 1 collegiate athletes, have been associated with significantly lower academic performance, in terms of Grade Point Averages (GPAs).

The current hypothesis is an inverse U-shaped relationship between hours spent on sporting participation and academic performance. As a student participates in sports, he may experience significant benefits initially, but as time spent on sports increase, lack of time left for study as well as diminishing returns from sporting benefits on study occur. This ultimately leads to worsening academic performance as hours spent on sports increase. The optimum time spent is yet to be discovered.

Hopefully this research will be able to aid university students to better allocate their time and simultaneously challenge preconceived notions towards sporting participation.

Natasha Musundire

IIE MSA

Family pressures to succeed and mental health in college students

In many developing countries, college students are becoming largely driven to achieve perfection than ever before. Following the intense economic pressures, many are faced with the desperate need of obtaining degrees that lead to desirable careers, with the hope of improving their family's socio-economic status (Sarma, 2014). However, under such circumstances of pressures to succeed, this may result in significant mental health issues in college students. Although the relationship between academic stress and mental health is well documented, there has been a gap in literature with regards to significant demographic factors that create academic pressure and mental health (Dundess, Cho & Kwak, 2009). Specifically, this study aims to investigate the relationship between family pressures to succeed and mental health among college students from low-income households.

The study used a literature review-based study by analysing, criticising and synthesising findings from other research studies. Results indicated that family expectations in succeeding after college completion led to depression, anxiety and other health-risk behaviours in many college students from low-income household. Furthermore, the direct impact was strongly associated with: fear of not attaining desired grades, fear of not being able to change their family's financial status and fear of dishonour from family members. The findings of this study highlight the importance of developing effective interventions and university services to reduce academic stress in college students. In addition, it is recommended that future studies continue investigating the impact of other demographic factors on mental health.

Roxanne Petropoulos

IIE MSA

Depression in relation to untreated ADHD and its stigma

The aim of this research report was to describe the correlation between depression and untreated and treated ADHD. In particular, the researcher will assess if individuals with untreated ADHD experience more depression as a result of the stigma from the untreated disorder compared to individuals with the treated disorder. The research conducted included demographics such as; age, gender, whether the individuals are receiving treatment for the disorder or not and the number of friends the individuals have. Participants were invited to complete their Socio-Demographic information, Stigma-by-Association Scale (SAS) and the Center for Epidemiological Studies Depression Scale (CES-D). Descriptive statistics were used to differentiate between the participant's demographics and their Total scores for both scales (SAS and CES-D). It was hypothesised that there would be increased scores indicating depression in individuals with untreated ADHD compared to those with treated ADHD as well as increased depression scores in individuals dealing with ADHD who were treated negatively. Both hypotheses were supported within the research, and it was evident that individuals with untreated ADHD who were treated negatively had the highest depression scores. Furthermore, it was concluded that individual's experiences with others in dealing with untreated ADHD, would impact their depression levels more so than dealing with treated ADHD.

Krutika Ambani

Monash University, Clayton Campus

A model to explain the evolution of nocturnal and diurnal sleeping patterns in mammalian species

Mammals have very diverse sleep patterns, including diurnal (day-active) and nocturnal (night-active) patterns. A computational model of the sleep-regulatory circuits in the mammalian brain has been able to parsimoniously replicate many sleep patterns found in mammals. The parameters in the model correspond to physiological processes in the mammalian brain. Although the model is able to reproduce mammalian sleep patterns, it is unknown why certain sleep patterns (and corresponding parameter values) evolved. In this study, two populations were simulated in a predator-prey system. Each member was represented by a 'genome' containing the model parameters. Evolutionary fitness was defined based on time awake, time asleep, interactions with one's own species, and interactions with one's other species. Genes that maximised fitness had a higher likelihood of being passed on to the next generation. 'Mutations' were introduced at random in each generation. It was found that if the prey population was on average diurnal, the predator population would evolve to also become diurnal. The prey would escape by evolving to become nocturnal and the predators would then also evolve to become nocturnal. This cycle continued indefinitely, with the predators lagging always behind (pursuing) the prey. Higher mutation rates were found to result in more rapid cycles. A toy model was developed to explain these dynamics. These findings indicate that co-evolution may be a key factor that drives selection of sleep patterns. The model could be used in future to understand the factors that led to humans evolving consolidated night-time sleep.

Peiyuan Luo & Sharon Tomy

Monash University, Clayton Campus

Investigating the drug mechanism of triazine dimer, a novel antimalarial agent

Malaria is a bloodborne protozoal infection of the Plasmodium species, predominantly Plasmodium falciparum which is responsible for upto 99.7% of malaria incidence in the African region. This protozoa is transmitted by the female Anopheles mosquito carrier through direct blood exchange. This epidemic threatens global health with an estimated death of 435,000 cases in 2017, particularly in the African and South American regions. The clinical presentation may be as minor as fever and rigors to jaundice, anemia and may even cause death if not treated effectively. This infection may be treated with antimalarials, such as chloroquine, quinine and artemisinin, depending on its origin. However, the increasing resistance to the frontline treatment, artemisinin combination therapy, is rapidly developing in the South Asian regions. This has highlighted the need and urgency in developing novel antimalarial agents. Triazine dimers are proposed to be a new class of antimalarial with a currently unknown mechanism. The most recent literature suggested that triazine dimers could exhibit its antimalarial activity in the same manners as chloroquine due to the similarities in their structure. However, the triazine dimers are equally as effective towards chloroquine-sensitive and chloroquine-resistant P. falciparum. It is therefore reasonable to speculate that triazine dimers may exhibits its antimalarial activity via a completely new mechanism. We hypothesised that triazine dimers are able to kill P. falciparum protozoans via DNA damage. The experimental investigation, comet assay, can be used to qualify and quantify the DNA damage.

Session 6D - Climate & Fauna Issues in the Australasian Region

Stephanie Daborn

Monash University, Clayton Campus

Mapping vulnerability to climate change in Australian cities

Climate change is an important issue threatening humanity both in the long and short term. While climate change impact relies heavily on the environment, vulnerability to climate change is also a function of human factors. The Intergovernmental Panel on Climate Change (IPCC) has found that age, language fluency, education and socioeconomic status are four of the most important demographic factors contributing to climate change vulnerability in urban settings. Urban areas are particularly important, as by 2050 the United Nations projects that 70% of the world's population will live in urban areas. This research uses 2016 Australian Census data and the Australian Bureau of Statistics' Census Table Builder tool to map Greater Sydney, Greater Melbourne and Greater Brisbane, illustrating which local government areas within these cities exhibit the highest climate change vulnerability. Vulnerability in this study was calculated as a function of the percentage of the population aged below 15 and above 65, English proficiency, high school completion and income below \$400 per week (the bottom third of incomes in Australia). Sydney, Melbourne and Brisbane have been chosen as combined these cities are half of Australia's population. This research found that local government areas on the cities' peripheries are generally more vulnerable to climate change. This research will inform local governments about the level of vulnerability in their area, allowing councils to determine whether policy and education programs addressing household climate change vulnerability need to be implemented immediately or as a part of a longer-term plan.

Session 6D - Climate & Fauna Issues in the Australasian Region

Ines Decorte

Vrije Universiteit Brussel (VUB)

Genetic diversity of the mud crab *Scylla serrata* along Indonesian coasts

The mud crab *Scylla serrata* is an important commodity in commercial fisheries in the Indo-West Pacific and especially in Indonesia. Increasing exploitation rates and mangrove degradation are threatening *S. serrata* populations along Indonesian coasts. The genetic diversity of *S. serrata* populations was investigated at three sample sites in three different geographical regions of Indonesia, which could provide useful information for fishery management. Tissue samples (pleopods) of 45 *S. serrata* individuals from three sampling sites (Kupang, Tarailu and Inamo) were collected and preserved in 99 % ethanol. A fragment of the mitochondrial cytochrome c oxidase subunit I (COI) gene was amplified, sequenced and used to analyse the genetic diversity and differentiation of the populations. The COI sequences showed 14 haplotypes within the three populations. Two of the three populations (Tarailu and Inamo) showed high haplotype and low nucleotide diversity, while the third (Kupang) showed both high haplotype and high nucleotide diversity. Kupang showed no genetic differentiation with the other two sites, likely as a cause of being located along a connecting ocean current. Tarailu and Inamo did show a significant genetic separation from each other. The necessity of having sustainable fishery practices and management is important for *S. serrata* populations that do not have a supply of larvae from nearby populations through ocean currents. More research will be necessary to receive a complete picture of connectivity and genetic diversity of *S. serrata* populations along Indonesian coasts.

Session 11A - Psychology

Alice Kunjumon

Monash University, Clayton Campus

Negative impacts of FoMO (Fear of Missing Out)

Aristotle once quoted "the more you know, the more you know you don't know." This quote summarises the craving for knowledge and belonging which leads to social media addiction.

Between 2018 to 2019, over 297 million individuals around the world have started using social media; with Facebook, YouTube, WhatsApp, Instagram, and Snapchat being the most popular forms of networking platform. As a result, individuals have been spending an increasing amount of time on social media; thus leading them to become addicted. One reason for this addiction is due to 'Fear of Missing Out' (FoMO). FoMO is defined as "a pervasive apprehension that others might be having rewarding experiences from which one is absent" (Przybylski et al., 2013). This notion has various negative impacts on individuals. Previous studies have explored the interaction between social media and FOMO. However, there has not been a literature review which has examined the negative social, physical and mental effect on individuals. Therefore, this study aims to fill the gap of literature review, as it explores the various types of effects (social, physical and mental) FoMOhas on individuals.

Francis Cheong

Monash University, Clayton Campus

How much should I sleep in on weekends? Modelling the intrinsic trade-off between social jetlag and sleep debt

Sleep regularity is an important predictor of health. Understanding factors that promote irregular sleep patterns is therefore valuable for the design of sleep interventions. People are often forced to wake at a particular time during the week due to social constraints e.g., work, education. This may accumulate sleep debt, which is often compensated for by 'sleeping in' on weekends (free days), resulting in what is known as social jetlag (SJL). Later 'evening' chronotypes struggle most with this, as their social times are not aligned with their preferred sleep/wake times. Night-time activities also delay sleep onset times, further away from regular work day sleep times, increasing SJL. Mathematical models of human sleep/wake have shown how exogenous factors, including work schedules, impact sleep regularity. However, endogenous sources of variability in sleep timing - including self-selected bed times - have not been explored. A previously validated mathematical model of human sleep/wake neurophysiology was extended to incorporate both sources. Exogenous factors were modelled as constraints on when sleep could occur, following a weekly pattern (5 work days, 2 free days). Endogenous factors were modelled as variability in the threshold for sleep onset. When exogenous factors were applied, the model reproduced empirical population-level patterns of sleep variability, including social jetlag. When endogenous variability was incorporated, the model reproduced empirical distributions of intra-individual wake effort, a need to provide greater conscious stimulation to maintain wake. This suggests that for different chronotypes, there may be an optimal wake time or range on weekends.

Session 11A - Psychology

Ashley Torres

Queensborough Community College, CUNY

Student Reactions to the Implementation of Problem-Based Learning in Introductory Psychology Courses: A Qualitative Review

Problem-based learning (PBL) is a student-centered pedagogical approach and curriculum design of methodology where learners are tasked with critically analyzing and solving problems. PBL is both problem centered, and learner centered in a dynamic process whereby students are actively involved in posing and solving problems related to the content and context under investigation. Recent research has indicated that PBL has positive implications for diverse populations. PBL surpasses language barriers, cultural behaviors, or gender and class social norms that can negatively impact student learning. This study takes place in the most diverse county in the United States at an institution that is equally diverse, with students from 139 countries and who speak 87 different languages. Within this study student reactions and vulnerability is not only measured by academic readiness or performance, but also on issues relevant to acculturation, socioeconomic status, and access to culturally-relevant pedagogy and support resources. An analysis of Psychology 101 student learning outcomes identified the need for students to meet higher level learning goals. Using a phenomenological qualitative approach, I am exploring themes in observed behaviors to students' reports of their responses to PBL in introductory Psychology 101 courses. Undergraduate introductory courses ordinarily aim to increase critical thinking skills and conceptual understanding of a broad range of concepts, the use of PBL in these courses is visceral since the core processes are deeply rooted in knowledge construction, self-directed learning, and contextualizing. This research focuses on the goals and benefits of PBL to increasing student learning outcomes for classrooms with diverse students.

Session 11B - Economic Policy & System

David Young

Monash University, Clayton Campus

Emerging Global Monetary Systems for the 21st Century

Since the GFC, various nations have begun constructing alternative monetary infrastructure, these include the International Monetary Fund's Special Drawing Right, various prospective Cryptocurrency innovations and hard/soft asset backed systems i.e. Gold/Energy. This development raises questions concerning the US Dollar's position and enforceability as world reserve currency. This is not a geopolitical 'housecleaning' issue but a socially frictional one of approaching concern given the contemporary political climate. Focus is placed on the relative strengths/weaknesses of the various emerging Monetary Systems as opposed to declaring a victor.

I am investigating monetary history to pre-empt analysis of modern monetary trends and Central bank foreign holdings alongside shares of international trade. My research also seeks evidence of contrast throughout various institutions monetary outlooks. I'm sourcing documentation from the US Federal Reserve, People's Bank of China, International Monetary Fund and the Reserve Bank of Australia for this contrast analysis. Additionally, a wealth of established and unique commentary on this issue will be exploited.

I anticipate that fundamental amendments to the current global monetary system would cause social, economic and political transitory frictions. Acknowledging this, the imperative outcome of this research becomes anticipating these frictions so as to minimise and/or mitigate extreme outcomes. Recognition of past structure, comparison of present alternatives and anticipation of future friction are the goals of my research.

Nuraiym Kemelova

Baruch College, CUNY

Kyrgyzstan's WTO Accession Results

The Kyrgyz Republic is considered to have the most liberal trade and investment policies among Central Asian (CA) countries. It was the first to introduce its currency, it removed the state monopoly on foreign trade and investment, and it was the first to join the World Trade Organization (WTO). However, despite these liberal reforms, the growth has been slow compared to other CA countries, and the integration into a world economy has been limited. The outcomes of the membership are complicated with the exogenous shocks such as the transition to the market economy after the collapse of the Soviet Union, and the Asian Crisis of 1997 that spread to Russia and CA. However, it is still possible to conclude the Kyrgyz republic's membership results. The paper argues that the WTO membership did not generate significant growth in both exports and investments in the Kyrgyz Republic right after the accession. The results show that the membership alone is not sufficient and needs to be supported by the sound regulatory environment for services that are closely related to exports and investments, the improved infrastructure, and elimination of corruption. Even though the overall outcomes are not positive, the WTO accession still proved to be advantageous for some sectors due to greater access to cheaper imports used in the production of goods, and the emergence of the clothing sector in Kyrgyzstan is an example. However, due to high informality of the Kyrgyz economy, the results of the WTO need further research using field studies.

Session 11B - Economic Policy & System

Silvio Pantoja

Baruch College, CUNY

Doomed to Fail: the Unsustainable Nature of Abenomics

Japan is the third largest economy by GDP, yet it suffers from protracted economic stagnation that has led to a severe demographic decline. This has been one of the largest economic dilemmas in decades. Many policies have tried to promote growth in the Japanese economy the latest being Shinzo Abe's Abenomics, announced in 2012. My research explores the short-term results of Abenomics in the seven years of its implementation and examines the long-term implications of the policy.

My research focuses on the monetary, fiscal, and structural policies implemented since 2012, noting the expected contribution to the Japanese economy of each. Then, using the data provided by the Statistical Office of Japan, as well as the IMF and World Bank, this paper shows that the realized short-term impact of the policies in terms of consumer demand, inflation rate, and total GDP growth is minimal, with demand declining, and stagnant GDP and inflation growth. In addition to the policies exacerbating long-term structural issues in Japan. My research highlights the disparities in the realized growth of the Japanese economy compared to the predictions Abe and his cabinet gave for the policies. Finally, it suggests that Abenomics will not be sustainable in the long term due to the rise of temporary workers in the economy, the declining population, and the nation's reliance on negative interest rates. By highlighting the ineffectiveness of these structural and monetary strategies this research hopes to suggest new solutions that will allow for sustainable growth in the economy.

Session 12A- Stigma & Discrimination - Past and Present

Emma Grace Clarke

Monash University, Clayton Campus

The Affects of Doubt: Wittenburg in 1550-1605

Satan in the sixteenth century, was treated by theologians as an exterior, physical threat, who recruited adherents to an anti-Christian sect these being in the majority, witches. These supposed adherent's ancient practices holy enough to them, were framed as diabolical by their erudite betters. Hans Peter Brodel states the sin of these learned men was not the fabrication of diabolical practices but viewing these traditions in the most negative way...However, one must question this perspective of the academic narrative that historizes a singular thread of theological discourse as one of domineering thought controlled by the state and ecclesiastical bodies. Consequentially it is imperative to analyses doubt and skepticism developed during the Early Modern Period that was marred by a true belief in the devil, leaving skeptical theologians to critique existence of witches and her acts of maleficium or harmful magics. To understand the effect of skeptics upon sociological patterning one must analyze popular thought of the masses, who were under the influence of a maelstrom of demonology. This demands a psychoanalytical examination of mirco-histories of trial records in Wittenburg followed by a comparison of result. Within these trials the overwhelming reality was that within the witch's narrative, the Devil only appeared after the use of torture, and many still maintained their innocence. The results of this research find that skepticism had a greater impact than initially understood by historians, this doubt observable on a nascent level within the witch's interrogational narrative.

Session 12A- Stigma & Discrimination - Past and Present

Rachel Sultana, Brooke Maat & Vanessa See

Monash University, Clayton Campus

The stigma associated with endometriosis pain management of working nurses.

Endometriosis affects 1 in 10 women of reproductive age in Australia, causing chronic pelvic pain. Current research has been directed toward new diagnostic tools for endometriosis, with a clear link between reduced mental well-being and management of chronic pain with medication. There is currently no research directed toward the stigma associated with the management of endometriosis pain with medication in healthcare professionals, such as nurses. We will investigate the attitudes of nurses with clinically diagnosed endometriosis towards their ability to manage pelvic pain with medication within a hospital workplace, and the stigma they may be experiencing. An online survey will be distributed to Victorian nurses with clinically diagnosed endometriosis who have worked within a hospital for a minimum of 12 months. These results will be statistically analysed, with results presented to key stakeholders in a 3 hour interactive workshop. The guest list has been created in conjunction with the Victorian Government's 'National Action Plan for Endometriosis', including state government, nursing unions and hospital workers. This workshop will promote multidisciplinary discussion regarding the stigma associated with the use of medication to manage endometriosis pain within a health workforce, leading to investigation of how hospital environments can become more supportive to nurses. This research will also provide a platform for nurses suffering from endometriosis to advocate for themselves. Overall, there will be further encouragement for open communication about chronic pain, its management and how workplace environments can become more supportive for healthcare workers.

Session 12A- Stigma & Discrimination - Past and Present

Gisselle Belia

Baruch College, CUNY

The Construction of Race in the census of the Dominican Republic

This study departs from a statistical approach to examine a unique dataset that provides insight on Dominicans' perception of race. Race can be defined in the context of being an autonomous field of social conflict, political organizations, and cultural/ideological meaning (Omi and Winant 1986, page number). The Dominican Republic National Census exemplifies how race can be used as a political tool. This paper analyzes the historical modifications to the race and color items in the Dominican Republic census survey, while comparing it with data from the Latin American Public Opinion (LAPOP) that examines racial discrimination and racial self-identification during 2012-2014. This comparison allows for the evaluation of the effect and of the consequences of removing the race and color items from the census survey. Since 1981, the Department of Statistics has severely constricted racial self-identification questions. This particular item was substituted with a citizenship question which has a broader meaning and allows for the differentiation of Dominicans from Haitians. In an effort to diminish the percentage of people who self-identified as black, during the dictatorship of Trujillo in YEAR, the item "Indio or Indigenous" became a racial category. Since some Dominicans are reluctant to identify as black, many prefer and classify themselves as "Indio." This paper examines this and other historical changes in racial identity, and aims to determine if there is a relationship between the census survey questions and the lack of racial identification in the Dominican Republic.

Session 12A- Stigma & Discrimination - Past and Present

Noah Bloomberg

Baruch College, CUNY

The Thirteenth Amendment and its Application for Mass Incarceration in the United States

The Thirteenth Amendment to the US Constitution, passed in 1865, abolished slavery in the United States. The legislators in favor of the amendment expressed their intentions for it to eradicate all conditions of slavery and their prejudicial effects such as denial of the right to testify and denial of the right to enjoy the rewards of [one's] own labor. The amendment, however, contained an important exception clause allowing for conditions of slavery when serving as a punishment for a crime. This clause has made possible mass incarceration in the United States; 25% of the world's incarcerated people are currently in US prisons. Additionally, people of color are disproportionately represented among the US's incarcerated population.

My paper will examine how the exception clause of the Thirteenth Amendment created a loophole for the US government to permit the same civic and racial injustices toward African-Americans to take place that resulted from chattel slavery pre-Thirteenth Amendment. Drawing upon law reviews, the history of slavery, and United States federal court cases, I will document how federal policies related to prisoners and the United States penal system have created a form of second slavery in the United States under the guise of a criminal justice system. The Thirteenth Amendment ostensibly eradicated an institution that deprived enslaved African-Americans of their natural and civil rights. In reality, however, it has replaced it with a legal permission for US private prisons to exploit disenfranchised people for cheap labor thus failing the goals of amendment's original supporters.

Session 12B- Education & Privacy

Mark Ranasinghe

Monash University, Clayton Campus

Evaluating a Multidisciplinary Diabetes Education Program for Improving Glycaemic Control and Cardiovascular Risk: A Retrospective Study

With a growing trend favouring fewer medications and greater emphasis on self-management through lifestyle change, health education programs offer a cost-effective and easily implementable method that could pave the future for chronic disease management.

Limited research exists on the efficacy of these programs for improving diabetes and cardiovascular disease, particularly in regard to objective measures of glycaemic control and cardiovascular risk. Such programs have the potential to be implemented across a wide variety of community settings.

In this study, we evaluate a community-based education program aimed at informing, engaging with and empowering patients with type 2 diabetes mellitus (T2DM) to make effective lifestyle changes.

The significant proportion of patients who underwent nil or positive change in relation to their glycaemic control medications highlights the value of education as both a supplementary and stand-alone tool. This is not only convenient and generally preferred by patients, but is also of financial benefit on a patient and government level. Beyond this, these programs may translate to reduction in overall downstream risk associated with cardiovascular and cerebrovascular adverse events. This also acts to reduce the burden on resources and efforts focused on addressing these dreaded further complications, in addition to improving patient prognosis.

The research also draws attention to the significance of empowering patients to seize control of their health through supporting them in developing self-management strategies and healthy habits that potentially carry benefit for a lifetime.

Stephen Enciso

Monash University, Clayton Campus

The importance of bilingual education to the health and wellbeing of Aboriginal people and the decolonisation of Australia

In the 1970s, the Australian Government funded a number of bilingual education programs in Aboriginal communities in the Northern Territory. These programs were welcomed by communities, who saw them as a way to preserve culture and identity across generations. Today, most of these programs no longer exist and the few that remain are fighting a constant battle against financial and institutional pressures to stay in place. In this article, I will argue that having properly funded bilingual programs must be seen as a necessity for the health and wellbeing of Aboriginal people, and an important part of the struggle to decolonise Australia. Firstly, I will engage with the literature on language policy and nationalism, focussing on recent policies in the Northern Territory, such as the First Four Hours Policy and the roll-out of NAPLAN, to show how language policy is complicit in de-legitimising Aboriginal culture and identity and creating pressures to assimilate. Then, I will turn to the theory of decolonisation, applying the concepts of Onkwehonwe scholar Taiaiake Alfred about the restrengthening of culture and identity, as part of the refusal to submit to the assimilatory and destructive logic of colonisation, to the Northern Territory context. I will argue that properly funding and supporting bilingual education programs is necessary for enabling the Warrior Spirit that Alfred thinks will regenerate Aboriginal peoples and make it possible to achieve his notion of Peace.

Session 12B- Education & Privacy

Xin Yi (Tina) Cheng & Harleen Chohan

University Of British Columbia

iCON: The impact of interdisciplinary, culturally-tailored health education in stimulating positive health behavioural changes in South Asian and Chinese populations in British Columbia

Approximately 30% of British Columbia's population consists of minority populations, of which 26% and 37% are South Asian and Chinese populations respectively. These communities bear a disproportionately large chronic disease burden compared to the general population, which can be reduced through modifying health behaviours. This project evaluates the effectiveness of interactive culturally-tailored health education, delivered by interdisciplinary health professionals, in improving chronic disease health outcomes. Evaluation metrics included: improvement of knowledge and management of health conditions, willingness to adopt lifestyle changes, and confidence in navigating BC's healthcare system. We conducted two, free chronic disease management health forums in two communities with large Chinese and South Asian populations and invited participants to fill out evaluation surveys at the completion of the events. Between 2018 and March 2019, 171 Chinese and 58 South Asian participants completed the surveys. Part A of the survey explored demographics (e.g. age, level of education, income, English proficiency), healthcare challenges respondents faced and confidence in accessing healthcare resources. Part B evaluated the effectiveness of the health forums in improving respondents' knowledge, self-management/prevention strategies and identification of specific changes they would like to make in their health behaviors. Post-forum interviews were conducted two months afterwards to assess actualization of health-seeking behavior. Our results demonstrate that this culturally-tailored, interdisciplinary, and interactive delivery approach to health education is effective in improving health outcomes in BC's Chinese and South Asian populations by encouraging willingness to make lifestyle changes and sustain them, and supporting improved access to resources.

Session 12B- Education & Privacy

Debbie Clark

Monash University, Clayton Campus

Biometric Information in the Workplace: A Legal Perspective

The rise of new sophisticated office sign in methods, such as fingerprint scanners, gives employers access to their employee's extremely sensitive information. The law has never recognised biometric information as property, but the Privacy Act 1988 (Cth) promotes the protection of the privacy of individuals and their sensitive information. Although biometric information is considered sensitive, it still can be obtained through notification and gaining consent. But as current privacy laws were drafted before the conceptualisation of new technology that collects sensitive information, how are employees to interact with, and protect their, biometric data collection? This presentation will identify the current state of Australian privacy laws concerning biometric information, and the unresolved issues surrounding if the concept of sensitive information itself is property. I will then discuss the legal scholarship of the increasingly fraught intersection of privacy, technology and regulation, and the impact for employers and employees in lieu of the recent *Lee v Superior Wood Pty Ltd* [2019] Fair Work Commission decision. Finally I will explore the common ground between the legal and philosophical debate on personal information, and imagine what ramifications for the workplace, and society as whole, would occur if biometric information was recognised as property.

Basya Buchbinder

Baruch College, CUNY

Synthesis of Novel Quorum Sensing AI-2 Inhibitors

Quorum sensing is a way that gene expression is regulated in a density dependent manner. The expression of genes that create biofilms will occur only when a certain threshold of signaling molecules are reached. Biofilms are extracellular matrixes that help bacterial organisms proliferate. Certain species of virulent bacteria use biofilms as a way to cause disease in humans. The signaling pathway that allows biofilms to form can be disrupted by inhibitors. One such pathway is known as the AI-2 pathway. This signaling pathway allows different species of bacteria to communicate their presence to each other. In this experiment, novel AI-2 inhibitors are created and tested on E.coli to determine their relative ability to disrupt formation of E.coli biofilms.

Sunjuri Sun

Monash University, Clayton Campus

Respiratory management strategies and bronchopulmonary dysplasia in extremely preterm infants

Background: Recent comparisons between different national neonatal registries have shown variations in clinical outcomes such as survival and bronchopulmonary dysplasia (BPD). There is often greater inter-centre variability in terms of clinical practices and respiratory management strategies, which warrants further investigation of how these variations influence neonatal outcomes.

Methods: A retrospective cohort study was conducted for all extremely preterm infants (born less than 28 weeks' gestation) admitted to Monash Newborn at the Monash Children's Hospital (Melbourne, Australia) and the Oxford Newborn Care Unit at the John Radcliffe Hospital (Oxford, United Kingdom) over a period of three years, from 2015 to 2017 inclusive.

Results: A total of 492 infants were included in the study 310 from the Oxford Newborn Care Unit and 182 from Monash Newborn. The overall incidence of BPD for extremely preterm infants was 62.20% and was similar across Monash and Oxford (64.84% at Monash vs. 60.65% at Oxford, $p=0.355$). There were significant differences in terms of clinical practices between the two neonatal units. Oxford had higher rates of incubation at resuscitation, surfactant administration and use of nitric oxide. Monash used nasal CPAP and parental nutrition more frequently than Oxford.

Conclusions: Bronchopulmonary dysplasia remains a significant cause of neonatal morbidity amongst extremely preterm infants. Despite significant differences in clinical practice, both units had similar rates of the composite outcome (BPD or mortality).

Jeremy Wein

Monash University, Clayton Campus

A Novel Alternative to Antibiotic Treatment in the Age of Multi-drug Resistance - Understanding how Chi-like phages target bacterial flagellum of Salmonella Typhi

Other than being causative agents of animal diseases, viruses have a paramount role in the biosphere. Bacteriophages, or phages, are viruses which infect prokaryotes. They are the most abundant lifeform in the biosphere, more abundant than all other life forms combined. They can attach to defined extracellular targets and inject their genome into the host cells.

Most phages are comprised of a head, containing a capsid within which their genetic material is enclosed, attached to a tail, specialised for genome ejection. Some viruses are able to attach and travel down the flagellum of their host cell and translocate their genome through their long tail tube into the bacterium. Such a phage is YSD1, a Chi-like phage recently discovered in a waterway survey in the United Kingdom.

This project aims to characterize the structure of the putative distal tail protein of the newly discovered phage, using protein expression, purification, crystallisation, and X-ray crystallography. Understanding this structure will may shed insight into host recognition and migration of the phage down the migration of the phage down the flagellum. Moreover, there is the possibility of gaining information as to the mechanism of genome ejection which YSD1 and other Chi-like phages employ. This which may have implications in our understanding of phage evolution, bacteriophage treatment for multidrug resistant infections, or maintaining a symbiotic relationship with our gut microbiome.

Farhan Chowdhury

Queens College, CUNY

An analysis of big data to curate, analyze and visualize the patterns of multiple atmospheric measurements in NYC to characterize urban air quality patterns.

Greenhouse gas (GHG) emissions and air particles have been increasing at an alarming rate for the past few decades. Since 80.7% of the population lives in urban areas across the United States (U.S. Census Bureau, 2016), atmospheric particulate matter is a hazardous environmental threat to the health of urban populations overall and specifically to New York City residents. Although federal, state and local regulations have reduced emissions from transportation, off-road, and stationary sources, the City's air quality still fails to meet Federal standards mostly due to ozone and fine Particulate Matter (PM2.5) levels. There are public health impacts associated with air pollution. NYC Department of Health & Mental Hygiene estimates that, every year, PM2.5 pollutions in New York City causes more than 3,000 deaths, 2,000 hospital admissions for lung and heart conditions, and approximately 6,000 emergency department visits for asthma in children and adults (Kizzy M. Charles-Guzman, 2012). Studying the patterns of various components in the atmosphere will lead us to better understand urban air quality and its spatial and temporal patterns.

My research is to compile, compare and correlate data from sensors measuring PM2.5, CO₂, O₃, CO, NO, NO₂, temperature, pressure, relative humidity, wind speed and wind direction. The sensors are located at the CUNY ASRC building in Harlem. This analysis will lead to further measurements to determine the major sources and sinks of these components.

Session 13A - Changes in Australian Culture, Education & Environment

Phoebe Tsai

Monash University, Clayton Campus

A Culture of Fear? An Analysis on The Media Portrayal of Offenders with Mental Illness

Mental illness has become a public health issue in recent years with increased political focus in Australia. The Terms of Reference (ToR) published by the recently announced Royal Commission into Victoria's Mental Health System (RCMH) highlights the political awareness of the mental health issues. This research aims to analyse media discourses from 2015 to 2018 on offenders with mental illness focusing on three Victorian media outlets: The Age, the Herald Sun and The Conversation. Existing research tends to focus on the health component and little has been done on the discourse surrounding offenders. As a result, this research will examine whether the media portrayals of offenders with mental illness perpetrate a 'culture of fear', and if it does, how does it do this?

Session 13A - Changes in Australian Culture, Education & Environment

Renate Plehwe

Monash University, Clayton Campus

100 years of Australian English: Variation and change in modal verbs of obligation

Previous research on the modal verbs of obligation (must, have to, need (to), (have) gotta, ought (to), should) in Australian English has failed to address key questions regarding the link between sociolinguistic variation and overall changes to the system; alternative functions of these modals, such as the epistemic function, have also received comparatively little attention. The aims of this study were to track changes in the modal verbs of obligation in spoken Australian English over time and to examine which social factors may be relevant to the spread of these changes.

The data on which this study is based were extracted from corpora from the Sydney Speaks project (Travis, 2014-2021). Participants (N=174) belonged to four ethnic communities (Anglo, Greek, Italian, Cantonese) and were born around Sydney between the 1890s and 1990s. The modals to be examined were selected based on previous research (Collins, 2005; Tagliamonte & D'Arcy, 2007; Tagliamonte & Smith, 2006). Over 3,000 tokens of the target modals were extracted and coded for analysis to identify changes in the system over time.

An increase in deontic have to and a decrease in epistemic must over time were observed, mirroring trends seen in other dialects of English worldwide. Other trends, such as an observed increase in deontic need (to), do not appear to have been reported in other dialects. Ethnicity also appeared to be a relevant factor for certain changes, such as the increase in deontic need (to).

This study provides valuable insights on variation and change in Australian English.

Tahnee Burke

Monash University, Clayton Campus

Investigation into the natural variation in sulfide distribution on xenoliths of metasomatised mantle from the Lake Gnotuk and Lake Bullen Merri Maars

Mantle xenoliths, chunks of mantle rocks that have been brought to the surface in sudden volcanic eruptions, provide insight into processes that occur in the Earth at depth. Specifically xenoliths can provide insight into chemical changes within a rock due to interaction with high temperature and high pressure fluids or magmas; termed metasomatism. By investigating the changes in minerals, compared with typical mantle rocks, information about the formation of ore deposits can be obtained. This assists in the discovery of new ore bodies by providing information about the conditions of formation. This is crucial as society depends on ore deposit minerals but new deposits are becoming harder to find. Several xenoliths from Lake Bullen Merri maar volcano in Western Victoria were investigated as thin sections under a microscope and through various light filters and magnifications. As ore forming minerals, sulphides, are carried in fluids rich in oxygen, it was assumed they would form in and around the hornblende crystals, which were formed by the infiltrating fluid. Results demonstrated that the sulphides were abundant in samples containing hornblende and magnetite, hydrous oxidized minerals, meaning oxygen rich fluid must have been added to the mantle. Subduction of oceanic crust allows sea water to infiltrate the mantle and cause multiple types of metasomatism. The resulting sulphide rich, high temperature and pressure fluid is a key step in the formation of an ore deposit. This research provides information about processes that are not directly observable but are integral parts of ore body formation.

Session 13A - Changes in Australian Culture, Education & Environment

Elizabeth Leong

Monash University, Clayton Campus

Are You ready Kids?: Perception of Preparedness for First Year Chemistry Studies at Monash University

The first year of university is by far one of the greatest challenges that a student will face in their educational career. It is a time in which students have to navigate and create a balance between learning new academic skills as well as obtain new social and independent living skills. Various literature has suggested that the success of their academic transition into university is highly dependant on their preparedness for the challenges that they will face in their tertiary studies (McInnis, 2010; McInnis, James &Hartley, 2000). This research explores the perception of preparedness for academic success among first year chemistry students at Monash University.

An online questionnaire was administered to approximately 1400 first year chemistry students. 845 students responded to the questionnaire which revealed that 88% of students have had prior chemistry knowledge and that 34% of the overall surveyed cohort considered themselves prepared or very prepared for university chemistry on a Likert scale. It was also found that students with prior chemistry knowledge had a more positive perception towards university studies compared to students who have not had prior experience with chemistry.

A post-survey is in process aiming to compare the students' perception in retrospect as well as that of educators. The findings of this research aims to demonstrate the impact of perception of preparedness on student success for the introductory first year chemistry units. The interpretation of this data will be used to inform future teaching methods in the School of Chemistry.

Session 13B - Pregnancy & Children

Adi Raber

Monash University, Clayton Campus

Predictors of Cognitive Enhancement following Attention Training: Evidence of Compensation in Children with Developmental Disorders

Recent years have seen a growing interest in how cognitive training interventions can enhance cognitive skills in children with developmental disorders. However, although investigating factors that influence training gains is vital in optimising this approach, evidence regarding who these interventions are most beneficial for has not yet been delineated. The current study aimed to examine the impact of daily living skills and symptoms of autism on outcomes of a cognitive attention training intervention in children with developmental disorders. Thirty-eight children aged 4-11 years with developmental disorders, attention difficulties and intellectual disability completed a cognitive attention training program, TALI Train, five times a week over a 5-week period. All children completed assessments of their attentional skills both before and immediately after training, while parents completed rating scales of their child's daily living skills and symptoms of autism before training. Mixed-effects model analyses showed that while symptoms of autism did not predict any gains following training, poorer daily living skills at pre-training predicted greater improvement in selective attention, the ability to attend to particular stimuli while filtering out distractors. The findings suggest that lower-functioning children have more potential than higher-functioning children for improvement in this domain. Thus, the importance of pre-existing capacities in tailoring interventions to the individual's specific needs is highlighted. This research provides encouraging evidence that cognitive attention training may be especially beneficial for those who need it the most.

Nicole Young

Monash University, Clayton Campus

Impact of maternal ethnicity on neonatal outcomes of babies born small

Background: Maternal ethnicity has been linked to differences in neonatal outcomes of premature babies. However, the relationship between ethnicity and neonatal outcomes of small for gestational age (SGA) babies is not clear.

Methods: Retrospective cohort study comparing neonatal outcomes of babies born SGA to mothers born in Australia, New Zealand (ANZ) to those born to mothers born in South Asia (SA) from a large metropolitan hospital network between 2013-2017. Univariate and multivariate analysis of neonatal outcomes between groups was conducted, including resuscitation, respiratory, conditions of prematurity, and outcomes of term infants.

Results: 1018 SA and 959 ANZ SGA babies were included. SA babies were significantly older (median (IQR) 39(38-40) weeks) and heavier (2590(2310-2780) grams) compared to ANZ babies (38 (37-40) weeks) and 2480 (2059-2740) grams; $p < 0.001$ for both. There was no difference in perinatal mortality (0.5% vs 0.9%; $p = 0.2$). After correction for differences in maternal and infant demographics, SA SGA babies were 1.5 times more likely to develop hypothermia (CI 1.1 to 1.8, $p = 0.001$); but 60% less likely to be born with a major congenital malformation (CI 0.2 to 0.7, $p = 0.001$) and 36% less likely to need gavage feeding (CI 0.4 to 0.9, $p = 0.02$) as compared to ANZ SGA babies. No significant differences in any other neonatal outcomes were observed. Conclusions: Babies born SGA to SA mothers have a different neonatal outcome profile as compared to babies born to ANZ mothers. Further research into the influence of ethnicity on placental function, organogenesis and fat stores of SGA may be warranted.

Session 13B - Pregnancy & Children

Ridmi Dolamulla

Monash University, Clayton Campus

Women's use of contraceptive methods over a 12-month period: Insights from the ACCORD study

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Context: The use of and the reasons for the use of different forms of contraception at particular stages of a woman's reproductive life is not yet widely understood. Analysis of data regarding women's choice of contraceptive methods may assist in providing a framework to general practitioners (GPs) about a woman's contraceptive journey.

Objective: To investigate the contraceptive histories of women involved in the ACCORD study

Design: The 'Australian Contraceptive Choice Project (ACCORD)' study was a cluster-randomised trial, which took place between April 2016 and May 2017. Women recruited, through GP clinics, completed baseline, 6 and 12-month surveys based on the US Contraceptive CHOICE project and adapted for the Australian setting. Questions included past and present contraception, bleeding patterns, side effects, level of satisfaction and reasons for discontinuation.

Setting: Melbourne metropolitan GP clinics

Participants: 740 women participants were recruited from 57 GP clinics. Eligible women were aged between 16-45, sexually active in previous six months (or expecting sexual activity in subsequent six months), in need of contraception, not pregnant nor planning a pregnancy, spoke proficient English and were interested in discussing contraception with their GP

Findings: Data collected from women at baseline, 6 months and 12 months will be analysed using the logistic model

Implication(s) for Practice: This quantitative analysis will help characterise the range of contraceptive products used and the reasons for their use by individual women assisting GPs to provide better contraceptive advice.

Session 13B - Pregnancy & Children

Miranda Quenby

Monash University, Clayton Campus

Maternal Antibody in Milk After pertussis vaccination: Report on the first 9 patients

Antenatal pertussis vaccination protects newborn infants from pertussis safely and effectively. Optimal timing is unknown and there are no studies investigating impact of timing on pertussis antibody levels in breastmilk. In this pilot study we aim to investigate antibody concentration in the breastmilk of women vaccinated at different times. Here we report on the first 9 participants. Breastfeeding women who had received pertussis vaccination in pregnancy were approached and given study information. After consent, a blood and colostrum sample was taken within 48 hours of delivery and a breastmilk sample at 14 days. Higher concentrations of anti-PT SIgA were found in colostrum compared to serum and breastmilk. The concentration of anti-PT IgG was higher in serum compared to colostrum and breastmilk. Anti-PT SIgA concentration decreased over the 2 week period with a mean concentration of 16.95 EU/mL in the colostrum and 3.45EU/mL in the breast milk at 14 days. There was no relationship between the week of vaccination and concentration of SIgA to PT in colostrum ($r=0.14$) Anti-PT SIgA and IgG is detectable in the breastmilk of women vaccinated in pregnancy. Further work is needed to evaluate any relationship with timing of vaccination.

Session 14A - Human Relationships

Zhou Yu

Nanyang Technological University, Singapore

A critical analysis of the values and ideologies portrayed in a selection of Roald Dahl's most popular books

Ranked as one of the top-selling children's authors, Dahl's books have reached many. This paper aims to explore a representative selection of Dahl's books by critically analysing the values of the main characters and the ideology of the author. In so doing, the paper seeks to draw out the differences in worldviews between Dahl's Britain and contemporary Singapore that might affect the young Singaporean reader's values. This study focuses on six of Roald Dahl's best-known books, which are therefore likely to hold significance for children's values education. Applying a political ideology framework of advocacy, attack and assent, the paper explores the characterisation of the main characters and the author's ideologies (both explicit and hidden) in the books. A review of the literature and Dahl's autobiography novel *Boy* surfaced three complexities in Dahl's portrayal of values. These concerned power relations between adult and child, violence being cushioned by humour and worlds with distinct extremes of good and evil. These themes were also applied in the analysis with particular reference to the politics of assent. The values and ideologies of the books were compared to the Desired Outcomes of Education and the National Pledge, in order to evaluate the potential significant effects of reading the books on children's values education in Singapore.

Session 14A - Human Relationships

Lim Jia Yi

Nanyang Technological University, Singapore

The Myth of Herbalism: An Inter-disciplinary Investigation of Plant Remedies Used on Alor Island

Herbalism: truth or myth? For centuries since the beginning of time, herbalism has been practiced in societies as the means of survival – the only, perhaps in ancient times – against diseases that have plagued the earth long before modern medicine found cures. For some, it continues to be a way of life. The Abui people, who have made their home in remote Alor Island, Indonesia, have treated themselves for hundreds of years with herbs and plants in their natural environment, and continue to do so today despite access to modern medicine. In fact, given the choice, they prefer natural remedies to those offered by science and technology. Building on previous studies, this paper further investigates the use of plant remedies to treat a variety of ailments using techniques employed by field linguistics, before applying interdisciplinary analysis to propose the possible socio-cultural motivations behind their strong belief in this healthcare system. The data collected with field interviews are compiled and presented in a botanical dictionary for plants in the Abui area, their medicinal properties and other relevant information. Using comparative methodology, herbalism practices in the Abui society is then cross-culturally dissected and compared to similar practices in other societies to identify patterns, and possibly, truth in the healing properties of these plants.

Session 14A - Human Relationships

Miguel Regalo

Monash University, Clayton Campus

Nurturing Good Friendships in Schools: An Aristotelian Response to Bullying

Bullying is the ongoing and deliberate misuse of power in relationships. Despite widespread and enthusiastic efforts to implement systematic prevention programs, it remains a ubiquitous issue in schools, and teachers often feel unconfident addressing non-overt incidents. Although there is broad recognition that fostering positive relationships is an essential component of an effective curricular response, many students (including bullies and the bullied) continue to find forming sincere friendships a challenge. In fact, friendships can be a source of bullying, wherever there are experiences of conflict, peer pressure, and social exclusion. Given such circumstances, it seems there is a need to re-prioritise friendship in schools, for both teachers and students, as a response to bullying behaviours.

Aristotle emphasised the cultivation of friendship as a central part of his ethical theory - he thought they were fundamental to developing as a virtuous person, and living a meaningful a life. Aristotle identified three kinds of friendship: pleasure, utility, and virtue, and it is the third that is most preferable because it is based on mutual well-wishing out of concern for one another. Such relationships take time to develop, and depend on care and empathy.

Can young people learn to redefine friendship? Can teachers help their students become better friends? Through a philosophical examination of productive and collaborative pedagogies, in light of the principles of Aristotelian friendship, the research intends to supplement contemporary approaches to student wellbeing with pedagogical strategies that place friendship at the centre of learning.

Session 14A - Human Relationships

Emma Grace Clarke & Sarah Comley

Monash University, Clayton Campus

Student Commensal Practice: Monash Case study

Our research explores the benefits of commensality (social eating) to university students' wellbeing, with a focus on isolated students. These isolated students are overwhelmingly international and rural students who are separated from their families. This isolation impedes students' abilities to benefit from commensality; yet these students have the most to gain. Benefits of commensality have been comprehensively studied within the family unit, with improvements to BMI, mental health, and food choices identified. Furthermore, commensality represents an opportunity to share stories that reiterate socio-cultural value systems and establish cultural identities integral to daily life. Students who are isolated are unable to perform these cultural storytelling rituals as they lack the socio-cultural structures that are necessary to perform them. We claim that the cultural, social and health benefits of commensality can also be applied to universities with the creation of the necessary social structures. We aim to explore the impact of food sharing within the intercultural context of Monash University as a pilot study. This is achieved through nine co-designed workshops run over across the university semester, in which socially isolated students are encouraged to engage in commensality and surveys. Through qualitative data collection and regular commensal practice, we analyse student self-reporting in four categories: social, cultural, academic, and health. These research workshops are expected to link the practice of commensality to improved student wellbeing, including: mental health, social capital, and educational agency.

Session 14B - Neurology & Self Identity

Melissa Choo

Monash University, Malaysia Campus

Fighting Dementia: A Literature Review of Interventions to Improve Overall Mood and Motivation in Patients with Dementia.

Background information:

World Health Organization (WHO) estimated that by 2020, the world population aged 60 and above would exceed the population of children under five, and by 2050, the population above 60 years would hit two million. WHO also listed dementia as one of the most common health conditions associated with ageing.

Dementia is a neurological disorder that deteriorates a person's memory, attention, thinking, orientation to time, place and person likewise affecting patients' quality of life due to the incapability to cater to their own daily needs like they used to before. Dementia has a positive correlation with depressive symptoms, usually resulting in a lack of motivation (apathy) in dementia patients, one of the biggest challenges faced by cognitive interventions. Research shows high levels of motivation dwindles the likelihood of severe cognitive decline. Hence, an increase in positive mood could possibly encourage a higher level of willingness to participate in intervention activities and is a crucial factor of mediating cognitive and everyday functioning in dementia.

Method:

This review will critically examine the current literature of interventions that targets to improve mood and motivation of dementia patients and provide possibly contribute as a steppingstone for future research on the current topic.

Implications:

Successful interventions of improving mood and motivation is important so that patients are more engaged in treatment activities and this could be implemented in the design of future cognitive or therapy interventions. This would enhance the efficiencies of various therapy interventions and further recover the patients' quality of life.

Session 14B - Neurology & Self Identity

Elizabeth Gerard

Monash University, Malaysia Campus

How Socioeconomic Status Affects Political Self-Identification Among Malaysian Youths

This study aims to investigate political self-identification (i.e., socio-political conservatism vs. liberalism) among Malaysian youths based on their socioeconomic status. In May 2018, Malaysia experienced a revolutionary political change after 60 years of governance by the National Front, made possible by young voters who made up 43.6% of the electorate. In the 2019 mid-year parliamentary session, the government will table an amendment to reduce the legal voting age from 21 to 18. Despite being a progressive move, Malaysian youths are ill-prepared to make informed political decisions. Youth political engagement literature rarely centres on multiracial societies, such as Malaysia, to investigate socioeconomic factors predicting political self-identification. Studying this will help Malaysian society to understand the changing trends of the electorate in forming more relevant and sustainable policies and initiatives. As such, the study aims to provide an alternative view to Western theory by investigating political self-identification in a society that is relatively racially segregated. Socioeconomic factors that will be examined include annual household income, levels of education, ethnic identification, age, gender and moral values. A representative sample will be obtained from private and government universities. To be eligible, candidates must have completed secondary education in a local government school; be currently enrolled in a pre-university or undergraduate programme; and be within the age range of 18 to 24. Data collection will involve administering surveys¹ analysed using multiple regression² and conducting focus groups involving five to six participants each.

Manini Bhatia

Monash University, Clayton Campus

Reliability of P wave Terminal Force V1

Background: Several ECG markers are postulated to represent underlying atrial remodeling and have been associated with ischemic stroke. P-wave terminal force in lead V1 (PTFV1) is one such marker. We examined factors that contribute to the reliability of PTFV1 and its association with ischemic stroke.

Method: Four hundred and thirty-five patients that presented with an ischemic stroke or transient ischemic attack (TIA) were identified through a prospectively maintained multi-site institutional stroke database. Control group consisted of age matched patients without prior history of an ischemic stroke or TIA. All patients underwent a 12-lead ECG and 24-hour Holter monitoring during the study period to exclude atrial fibrillation.

Results: Morphology consistent with PTFV1 occurred in both the stroke/TIA and control groups, with no significant difference in the median PTFV1 value between the stroke 3.96 mV ms [Interquartile range (IQR) 2.78 5.58] and control 4.23 mV ms [IQR 2.91 5.57] groups. Measurements of PTFV1 demonstrated excellent intra-observer reliability on the same P-wave (Intra class correlation (ICC) 0.91, p < 0.001) however a change in the P wave assessed led to a significant reduction in reliability (ICC 0.79, p < 0.001). Interobserver, inter P-wave assessment demonstrated further reduction in reliability (ICC 0.68, p < 0.002) with wide limits of agreement 6.17 5.78 mV ms, indicating significant under and overestimation of PTFV1.

Conclusion: The utility of PTFV1 as a clinical marker for ischemic stroke is limited by the reduction in reliability associated with inter-observer and inter P-wave measurements.

Sophie Huei Yi Thong

Monash University, Clayton Campus

A Proposed Model of Altered Time Perception in Unipolar and Bipolar Depression

The subjective feeling of passing time, the speed at which time appears to move, has been reported to be distorted in people with mental illnesses. Specifically, time has been experienced as slowed in unipolar depression while in bipolar depression, during phases of mania, time has been felt to move rapidly. Yet, despite these reports, few studies have examined the mechanisms that may underlie such altered time perception in unipolar and bipolar depression. In the literature, a model that may explain this phenomenon is the Dynamic Occupation in Time (DOiT) model (Larson, 2004). This model proposes that feelings of passing time during a task follow a left-skewed bell curve that begins with feelings of slowness, peaks with timelessness and ends with slowness again. These feelings result from a combination of two components: how intensely one is engaged in a task and how well one's capabilities match the perceived difficulty of said task. While not explicitly related to depression, after substituting the concept of a 'task' with the act of rumination, the latter component with emotional valence (negative to positive) and the ending slowness with time disruption, the model appears apt to describe altered time perception in both types of depression. Thus, by adapting the DOiT model with such substitutions, this research ultimately aims to offer a possible model of altered time perception in unipolar and bipolar depression. Additionally, the possible bidirectional relationship between time perception alteration and both depression types and its associated therapeutic implications will also be considered.

Session 14D - Technological Innovations

Gan Beng Yee

Nanyang Technological University, Singapore

Numerical Simulation of Spin State Spectroscopy in Silicon Double Quantum Dots

Future solid-state based quantum information processing will rely on binary quantum degrees of freedom that can be individually addressed by electronic or optical means. Electron spins confined to silicon quantum dots are promising candidates due to the abundance of nuclear spin free isotopes and the weak spin-orbit coupling inherent to silicon. However, the quantum dot single-particle spectrum can be complicated by additional valley degrees of freedom, possibly obscuring the binary spin degrees. Detailed information on spin and valley degrees of freedom can be obtained by higher-order tunneling spectroscopy in applied external magnetic fields. However, to date, spin-dependent co-tunneling in double quantum dots remains poorly understood. Here, we analyze spin state spectroscopy, measured in a donor-based silicon double quantum dot by representing the cotunneling current using a numerical model based on the Quantummaster equation for Quantum dot transport (QmeQ) package in Python.

Tang Xin Hui

Nanyang Technological University, Singapore

Aerogel Catalyst

Carbon dioxide is the most abundant greenhouse gas in the atmosphere. Therefore, great research attention has been given to removing this greenhouse gas from emissions and converting it to useful products such as methane. In this project, a series of Ce-doped, alumina supported nickel aerogel catalysts were developed by supercritical CO₂ drying of sol-gel precursors. Both the sol-gel chemistry and the drying procedure were optimised to yield aerogel catalytic monoliths. The catalysts with varying Ce:Al ratio and 1% Ni loading were tested for CO₂ methanation at 1 atm pressure between 200 and 500°C. Prior to reaction, the catalysts were reduced in pure hydrogen gas at 500°C for 3 hours. A benchmark catalyst of 1% Ni on alumina was also prepared by incipient wetness impregnation. The results show that the addition of ceria on alumina support affects the structure of the catalyst support and the metal-support interactions, which in turn lead to changes in conversion of CO₂ and selectivity of CH₄. At low ceria content, the optimum temperature for methane selectivity is 350°C. At high ceria content, both the selectivity towards methane and conversion of CO₂ increase with temperature.

Session 14D - Technological Innovations

Tong Xie

Monash University, Clayton Campus

Ionic Diffusion within MAPbI₃ Perovskites

Hybrid organic-inorganic metal halide perovskites have gained attention as high-performance thin-film photovoltaics. A two-step deposition is often used to obtain high-quality films. The diffusion of the halide salts into PbI₂ films is the determining factor of the second step. The diffusion of MAI into PbI₂ films can cause the mass increase of the PbI₂ films. Quartz crystal microbalance (QCM) can record the dynamic mass change of a thin film over time with ng/cm² resolution. This will be used to monitor ion diffusion into perovskite films, to help understand the diffusion mechanism of sequential deposition. The insights gained could further increase the efficiency of perovskite solar cell and lead to a better approach to large-scale fabrication.

Session 15A - Histories of Memory & Texts

Phoebe Ng Hui Yin

Nanyang Technological University, Singapore

In The Defence of Children's Fantasy

Fantasy has often been relegated to the domain of children because it does not fit the conventions of 'serious' literature, characterised as genre of the impossible, of inventive fiction, and of made-believe realms. In "Children's Literature in the 1890s and the 1990s", Kimberley Reynolds observes that contemporary fantasy utilises fantastical elements to make comments about the present state of civilisation and society. This is also echoed by Graham Martin in "An Inquiry into the Purposes of Speculative Fiction – Fantasy and Truth" who refines the characteristics of fantastical elements into various metaphors for psychological states, ranging from Session 14A - Human Relationships to political systems. Paying close attention to the imaginative geographical landscape, "The Neverending Story" in particular reflects the use of fantasy narrative space tying closely to psychological states and how the individual relates to the world around them. Attempting a psychological interpretation of Michael Ende's "The Neverending Story" (trans.1983), this essay aims to deconstruct the bildungsroman narrative through how it is used in contemporary fantasy, examining the ways which fantasy - through the act of reading - affects the figure of the child reader. Taking material from Shoshana Felman's "Literature and Psychoanalysis" and reverting back to the classic definitions of the fantasy and children's genres respectively as outlined by Tolkien and C.S Lewis, it adopts the perspective that the use of fantastical elements are invaluable as an emotional bulwark when situated within the genre of children's fantasy. As such, it carries therapeutic potential as a form of long-term emotional rehabilitation.

Session 15A - Histories of Memory & Texts

Gavin Waldron

Monash University, Clayton Campus

Johanan Alemanno: A Jewish Influence on the Florentine Renaissance

The late-fifteenth century saw a growing interest in Jewish philosophy among Florentine humanists, with the appraisal of *Hebraica Veritas* prompting Christian writers to work more closely with their Jewish contemporaries. Johanan Alemanno, a Jewish Kabbalist and philosopher, developed a friendship with the prominent humanist Giovanni Pico della Mirandola. This relationship enabled the exchange of ideas and textual resources, and directly contributed to Pico's development of a Christian form of the Kabbalah. This paper will discuss the collaboration between these two figures, exploring the ways in which their respective streams of thought were adapted across traditional divides.

Pico encouraged Alemanno to write a commentary on the Song of Songs and a piece on Solomon's virtues. 'The Song of Solomon's Ascents' was completed between 1488 and 1490, while Pico was finishing his own 'Heptaplus', a commentary on the six days of creation. This research draws upon selected anthropological writings, comparing philosophical and theological aspects to chart the confluence and divergence in their interpretations. Although Pico and Alemanno's religions and ideas ultimately differed, they shared a number of influences, and their fruitful collaboration can be traced in their respective works.

Session 15A - Histories of Memory & Texts

Adam Weitzer

Monash University, Clayton Campus

Performing Pasts: Constructions of Memory in Dmitri Shostakovich's Thirteenth Symphony in B flat minor, Op. 113 'Babi Yar' (1962)

While the study of cultural memory has dominated the humanities since the 1980s, it has only been acknowledged in musicology in the last decade. This paper considers commemorative art music from the early 1960s, when collective understandings of the Second World War were crystallising. Dmitri Shostakovich's Thirteenth Symphony in B flat minor, Op. 113 'Babi Yar' (1962) commemorates the massacre of 33,000 Jews by Ukrainian forces in 1941, setting five poems by Yevgeny Yevtushenko. Coupling Pierre Nora's monumental theory of collective memory with Edward Casey's phenomenological theory, I argue that this symphony is not only a retrospective 'site of memory', but that it is a 'site of remembering' which enacts the processes of historical memory-making within the music. To do this, I explore how the symphony creates a cyclical sense of time, and how Shostakovich's appeal to mimesis brings us closer to a direct re-experiencing of the subject matter. The presence of text, however, complicates issues of representation. On one level, I argue that Shostakovich's use of separate poems from different perspectives in each movement contests the Soviet Union's silencing of individual voices. On another level, his linking of the movements through a recycling of musical motives implies a broader transnational unity which characterised his ideal of 'Russianness.' To date, most scholarship has focused on how music becomes a 'site of memory' through its consumption and reception; this study seeks to go 'inside' the music to better understand how it may embody lived historical experiences.

Session 15B - Food & Agriculture

Thi Minh Chau Nguyen

Monash University, Clayton Campus

Intellectual property rights in restaurant food presentation: appealing appearance, but "difficult to digest"?

Intellectual property (IP) rights are part of a business' goodwill, which can contribute significantly to its commercial values. Yet, the protection of these assets is usually undermined by most businesses in the high-end restaurant industry, as protecting novel creations such as dishes' presentation and decoration techniques seems too unusual. Ironically, restaurant owners and chefs have become increasingly concerned that their unique and innovative techniques are imitated by knockoff businesses which gain profits without authorisation. This research addresses the protection of IP rights of restaurant food presentation in Australia, showing how the current social norms are not sufficiently effective in response to this issue. A study of Australian legislation, in particular the Copyright Act 1968 and the Trade Marks Act 1995, in light of literature review in comparison with the US, suggests two available legal tools: copyright and trademarks. A preliminary analysis indicates that current Statutes appear relatively flexible and open to recognise new categories of IP rights. Nevertheless, the Court remains reluctant to recognise and enforce such rights in practice due to lack of settled rules in this novel area. Additionally, a literature gap in the high-end restaurant industry opens up avenues for future academic research and debates to address IP rights infringements in relation to restaurant food presentation. More broadly, this research also raises awareness of the law and of the public at large to turn their minds to and adapt to the evolution of new IP rights in the modern society.

Session 15B - Food & Agriculture

Devmi Piyadigama & Saareta Devi Ramesh

Monash University, Malaysia Campus

Impact of an educational intervention on organic and genetically-modified foods for university students in Malaysia

Knowledge and attitude towards organic and genetically-modified foods are a major concern as studies conducted show that opinions among the general population are based on personal experiences or beliefs and not on scientific facts. From previous studies conducted in Malaysia, college-aged consumers are an understudied population. Thus, it is important to study university students as they are considered to be more open-minded compared to the general population. The research aims to create a visual-based educational intervention to inform individuals about genetically-modified and organic food to increase their knowledge. It will investigate the change in knowledge and attitudes towards organic and genetically-modified food of Malaysian students at Monash University, Malaysia Campus. Data will be collected using pretest and post-test questionnaires obtained from previous studies. The impact of the intervention will be analyzed using Statistical Package for the Social Sciences (version 24). A forum with experts will be organized to explore the topic of genetically modified and organic foods, and to generate further discussion on the current situation in Malaysia. The research is expected to encourage individuals to critically challenge their assumptions and promote informed consumer decision-making behavior.

Shi-Cheng Tong

Monash University, Malaysia Campus

Effect of cumulative addition of natural antioxidant on the stability of deep-frying oil

The usage of synthetic antioxidants in food industry is a major concern nowadays. This piques the interest of many to seek for naturally derived antioxidants. Here, the effect of cumulative addition of 99ppm of natural antioxidant namely ascorbyl palmitate, tocopherol and carotenoid on the degradation of oil during deep frying process was examined. Frying process was carried out for 13.5hour over a period of 3 days. The quality of oil at the end of frying was examined by analysing the total polar material (TPM), fatty acid composition (FAC), Fourier Transform Infrared Spectroscopy (FTIR), free fatty acid content (FFA), peroxide value (PV), colours and viscosity. Results showed that performance of antioxidant during deep frying process was: ascorbyl palmitate > tocopherol > carotenoid with TPM increment of $7.7\% \pm 0.50$, $8.6\% \pm 0.55$ and $14.7\% \pm 0.24$, respectively. However, synergistic fortification (tocopherol + ascorbyl palmitate) appears to perform worst within all test groups. Result of FAC and FTIR had shown similar trend in all set of oils with a decrease in carbon chain length and increase in amount of trans fat upon deep frying except for tocopherol and synergic fortified oil. Synergic fortified oil appears to have largest increment in FFA content ($0.338 \pm 0.0048\%$) and change in colour (3.66) while carotenoid fortified oil showed greatest increase in viscosity (143.6cP) and PV ($11.58 \pm 0.27\text{meq/kg}$). In conclusion, addition of natural antioxidants, particularly ascorbyl palmitate, at concentration of 99ppm successfully reduced the degradation of oil during deep frying process when used individually.

Session 15B - Food & Agriculture

Alisha Fulton

Monash University, Clayton Campus

A cost-benefit analysis of regenerative agriculture in Australia

Conventional agricultural methods rely greatly on non-renewable resources and impact heavily on soil health. Rising global temperatures and a growing global population make food security an increasingly important issue, and therefore it is vital that soil health is maintained in order to provide resources for future generations. Regenerative agriculture is a method of agriculture with the overall aim of sequestering carbon in soils; that is, pulling carbon out of the atmosphere and returning it to the soil as soil organic carbon. Therefore, conducting at least four of the six annual cropping practices involved in regenerative agriculture will have a huge impact on both human and climate health. This study aims to assess both the benefits and costs of regenerative agriculture in Australia, as well as its potential as a tool for climate change mitigation. This assessment was done through an analysis of the current literature on regenerative agriculture, with particular consideration of the organisation 'Regenerative Australian Farmers' as a case study for regenerative agriculture in the Australian context. It has been found that the initial set-up costs of regenerative methods can be significant, however, its long term profitability outweighs this, particularly during times of drought. 'Regenerative Australian Farmers' is an organisation that provides financial packages and services to farmers wishing to implement regenerative agriculture. It is suggested that this type of service be replicated in other countries, particularly developing countries, in order to overcome the initial costs of regenerative agriculture and establish a sustainable alternative to conventional agriculture.

Session 15C - The Influence of Media & Media of Influence

Paris O'Rourke

Monash University, Clayton Campus

Communicating climate change: An analysis of framing methods through a case-study of Walrus environments in the media.

While there is a 97% scientific consensus that climate change is anthropogenic, this is not reflected in the public and political agreement on the issue. The media have a large influence on how an issue is communicated and perceived by the public. This research aims to explore how current climate change events are framed in the news, through examining a case study. An integrative literature review of three theoretical papers and two news media examples will be used. The case study highlights the effect which climate crisis have on Walrus', an issue initially explored in David Attenborough's 'Our Planet' documentary. The Walrus' natural habitat, the sea-ice, has moved north due to climate change, this causes the creatures to jump off cliffs into what they think is water and consequently die or seriously injure themselves. The three authors explored, Nisbet, Beck and Newell et al, underline that climate change frames play on the idea of personal experience, by reinforcing thoughts of terror and tragedy. The discussion will also look at the psychological disconnect between the general public and climate change science through an investigation into how humans question traditional authorities. The framing of climate change has a direct influence on public opinion and action regarding social justice movements, voting and domestic practices such as recycling.

Session 15C - The Influence of Media & Media of Influence

Joelen Kong Ling

Nanyang Technological University, Singapore

Who Am I? - Multiple Identities on Instagram

“I” is a collective creation of the many different aspects and facets of a self. It is the product of a continuous performance, where our repeated expressions, actions and thoughts make and remake who we are. With the advent of the internet and social media, “being” online mediates how we express and form our identity. The phenomenon of the finstagram (fake instgram account) versus the rinstgram (real instgram account) in particular poses the question of why multiple distinctive identities are created. As such, this paper aims to explore how the experience of being online affects the negotiation of meaning behind the identities that make up who we are through semi-structured qualitative interviews. Interview results revealed that content differed based on its expected reception, as well as the audience it was intended for. In addition, recurring themes of journaling, expressive release and identity management were found to be motivating factors of maintaining separate accounts. Implications, limitations and future directions are discussed.

Session 15C - The Influence of Media & Media of Influence

Cheng Shao Meng

Nanyang Technological University, Singapore

Virtual Reality: Visualizing a 1850s Singapore River Artwork

This essay discusses the research and work that goes into translating an 1850s lithograph, 'Singapore River with Thomson's Bridge', into a 3D environment and virtual reality (VR) application. This project is done to commemorate Singapore's Bicentennial, a critical look into Singapore's past as Singapore observe Sir Stanford Raffles' landing into Singapore's shore 200 years ago. This project will investigate published VR works; the history and depiction of Singapore River during the colonial period; and the technical challenges of visualizing a 2D artwork into 3D using Epic Games' Unreal Engine 4. It will then conclude with putting all the elements together into an installation booth, with feedback gathered from participants using the first prototype of the installation. This essay will place heavy emphasis on the different methods of obtaining facts and information on visualizing an 1850s Singapore River using sources such as historical artworks, photographs, maps, books and online articles. It will also examine the usefulness, issues and limitation of these sources and how they help to inform the development of the application.

Session 15C - The Influence of Media & Media of Influence

Kathryn Quinn

Monash University, Clayton Campus

Ruth Bader-Ginsburg, a fan created Instagram 'influencer'?

In a time where social media infiltrates almost every aspect of young people's lives (Khamis, Ang & Welling 2017), the presence of educational role models on social media platforms could have far-reaching potential to inspire success. As role models in the academic sphere have not traditionally had a strong social media presence (Mendick, Allen & Harvey 2015), there is a gap in existing literature. This study considers how Ruth Bader-Ginsburg, Associate Justice of the United States Supreme Court, and an iconic academic figure, has been celebratised and celebrated on Instagram, to inspire young people. While Bader-Ginsburg herself does not have a social media presence, a simple Instagram search of '#notoriousrbg' returns over 75,000 results, predominantly posted by young females, inspired by her brilliant career. This case study examined the 100 top posts on Instagram with the hashtag #notoriousrbg. Data was collected over a period of five consecutive days, with 20 images collected per day. A content analysis of the Instagram posts and captions was employed to identify four common themes: artwork, branding, occasion, and feminism. The images were coded depending on the themes they had the strongest connections to. It was found that Bader-Ginsburg is generally depicted in two ways: either she is celebratised as a super hero type figure; or, she is admired for the positive changes she has made in the realm of gender equality. These findings indicate that Bader-Ginsburg is celebrated in a particularised and common manner by her fans and followers, that is informal and relatable.

Joycelyn Khoo Yi Xin

Nanyang Technological University, Singapore

Synthesis of a pH-Indicating Polymer via Living Radical Polymerization for Wound pH Monitoring

The surface pH of a wound (pH 7.5-8.9) is alkaline and it approaches the acidic pH of a healthy skin (pH 4.0-6.0) as it heals. As such, the recovery progress of a wound could be monitored via its pH. Phenol red, a pH indicator, is suitable to monitor the changes in the pH of a wound as its pH range of 6.8-8.4 coincides with the decreasing pH of a recovering wound. In light of the above, a biocompatible copolymer with pH-indicating properties was synthesized from methacryloylated phenol red (MA-PR) and poly(ethylene glycol) methyl ether methacrylate (PEGMA) via organocatalyzed living radical polymerization (LRP). MA-PR is a compound that is modified from phenol red for the subsequent copolymerization with PEGMA. To yield MA-PR, methacrylic acid was converted to methacryloyl chloride before the latter was reacted with phenol red. The conversion of MA-PR from phenol red was 28%. The copolymerization of MA-PR and PEGMA was carried out for 24 hours at a mild temperature (60°C). Its polymer molecular weight distribution index ranged at 1.4-1.8 and the highest MA-PR to PEGMA ratio obtainable in the copolymer is 1:21. As pH increases, the colour of the copolymer changes from yellow (pH 2) to orange (pH 7) to red (pH 9). The biocompatibility and the pH-indicating properties of this MA-PR/PEGMA copolymer demonstrate a potential to be utilized as a material to keep track of the healing progress of a wound.

Lee Cai Ling

Nanyang Technological University, Singapore

Thalassasmia Testing and Reproduction in Singapore: Abstract

With the advancement of technology in the past decades came the ability for foetuses to be tested. Such technologies play a vital role in reproductive decision making for couples. However, studies on the social impact of such technologies are only starting to catch up to these technologies. This paper presents a systematic review on Southeast Asian papers on prenatal genetic testing. Specifically, the author seek to explore motivations behind genetic testing in cases related to the genetic blood disorder Thalassaemia. The paper adopts an online ethnography approach, termed netnography, where the author garnered observations through technology-mediated communications in online forums. Findings indicate a general support for screening for reasons such as knowledge and planning for possible termination of afflicted pregnancy. On the use of online-mediated communications in the process of reproductive decision making, users regard it as a way to seek out knowledge from other experienced people, and also to share their experiences with others in similar predicaments. This paper serves to reiterate the importance of social considerations in shaping the outcomes of genetic testing, and to also highlight the uses and limitations of netnography when used in such settings as the research paper.

Regine Tiong Hui Yi

Nanyang Technological University, Singapore

The Absence of Neptune's Pearls Changes the Benthic Microbial Diversity on the Substrata

Marine microbes play a fundamental role in the health of habitat-forming species like coral and macroalgae that support their respective ecosystems in terms of its biodiversity. Conversely, understanding how microbial community changes due to anthropogenic removal of these species would give us insight on their influence on the microbial diversity on the substrata. With disappearance of *Hormosira banksii* on the coastlines of Australia and New Zealand, we used it as our target habitat-forming seaweed at Coalcliff, NSW, Australia. We removed *H. banksii* in densities of 100% and 50% and we compared the microbial diversities of these manipulated plots with 3 controls, including bare rock, untouched *H. banksii*, as well as untouched with scraping. Controls had higher microbial richness and evenness than both treatments. Richness and evenness decreased with the increasing removal of *H. banksii*. Microbial communities with fully removed Neptune's pearls were more similar to the ones found on the bare rock, with the exception of having a slightly higher proportion of Gammaproteobacteria. With increasing removal, Oxyphotobacteria was more prevalent while Verrucomicrobiae and Planctomycetacia were less prevalent. Yet, the community structure of the bare rock still remained distinct compared to the rest of the samples. The action of scraping was not significant in changing the microbial diversity of the substrata. The removal of Neptune's pearls was not significant in altering the microbial diversity on the host itself. Through this study, we were able to highlight how the absence of macroalgae is able to influence the community structure of benthic microbes.

Zahraa Al bander

Monash University, Clayton Campus

The relationship between the gut microbiota and inflammation

The gut microbiota encompasses a diverse community of bacteria that carry out various functions influencing host functioning. These comprise nutrient metabolism, immune system regulation and natural defence against infection. The presence of certain microbes is associated with inflammatory molecules that may bring about inflammation in various body tissues. Inflammation underlies many conditions including obesity, atherosclerosis and type 2 diabetes mellitus. Inflammation may be triggered by structural components of the bacteria which can result in a cascade of inflammatory pathways involving interleukins and other cytokines. As the gut microbiota composition differs between individuals and is contingent on a variety of factors like diet and genetics, some individuals may possess bacteria with pro-inflammatory effects whilst others may harbour those with anti-inflammatory effects. Recent technological advancement has allowed for better methods of characterising the gut microbiota.. This cross sectional study looks at the gut microbial species present within a sample of 41 overweight or obese individuals. It examines their faecal microbiomes for microbial species, and serum and blood markers to determine inflammatory molecules present, in attempt to identify a relationship between specific bacteria and inflammation, whilst accounting for confounding from diet and exercise through outcomes of validated questionnaires. Through multiple regression analyses, the species associated with inflammation can be identified. This in turn may inform clinical practice as anti-inflammatory microbes can be sought and utilised in prebiotic and probiotic therapy.

Emmaline Cher Chin Yeoh

Monash University, Clayton Campus

P53 and its altered presentation in cancer.

Cancer is the second leading cause of death globally. Tumour suppressor genes, when inactivated by mutation, causes cancer and are usually inactivated by frameshift or nonsense mutation. However, it is mostly due to missense mutations in TP53 (located on chromosome 17p.13.1), which is a tumour suppressor gene that provides instructions for making a specific protein, p53. Based on literature review, p53 typically functions as a tumour suppressor, meaning it controls cell division by preventing cells from dividing and growing uncontrollably. By attaching itself to damaged DNA, p53 determines whether it should be repaired or undergo apoptotic cell death (self-destruction). In a repairable DNA, p53 initiates the repair by activating other genes. If the DNA is unrepairable, its division comes to a halt preventing the development of tumours. Preliminary research has shown that mutations, in general, can be very different in terms of their type, position and structural impact. In TP53 mutation, it results in mutated p53, which can alter its presentation to p53-specific T cells making it undetectable by the host's immune system. There is a need for more information on how p53 is able to survive undetected. Therefore, this abstract calls for further research and analysis to be conducted on the ability of the protein that mutated TP53 produces. Insights of the research can then be a guide to the development of new cancer treatments providing more sustainable options for cancer patients.

Ryan Sam Zhi Hao

Nanyang Technological University, Singapore

Investigating the Impact of Physical Activity on Myogenesis through the Gut Microbiome

The gut microbiome is tightly regulated by host physiological changes including disease, sex or exercise level creating a unique gut microbiome composition. Consequently, the metabolites from the gut microbiome are heavily involved in host energy metabolism. Previous reports showed that germ-free mice had reduced muscle mass and that exercise influences gut microbiome composition changes. To understand the mechanism of gut microbiome on host muscle physiology, gut microbiome from active and sedentary young human donors were transplanted to germ-free mice. All active donors had higher butyrate levels compared with the sedentary group, suggesting a different microbiome composition. Although there was no difference in body weight and food intake, we found increased muscle weight in active group and increased fat contents in sedentary group. Interestingly, FGF21 mRNA levels in the tibialis anterior muscle was increased in the sedentary group. FGF21 is regulated by butyrate and known to lower blood glucose and triglyceride levels via neural signaling pathways. However, insulin and TG levels were not significantly different between active and sedentary groups. Lastly, serum FGF21 levels were variant by batch suggesting that serum FGF21 does not accurately reflect TA muscle FGF21 mRNA levels. Overall, we have confirmed that host activity level and microbiome interaction had effects on muscle weight and fat contents. We found increased FGF21 in TA muscle, however serum level FGF21 was variant by batches. This strongly suggests that microbiome does affect muscle mass and function, while further studies to uncover the correlation between microbiome and FGF21 changes are highly warranted.

Sasha Hermosa

Monash University, Clayton Campus

The role of alcohol consumption in people who inject drugs treated for hepatitis C

Hepatitis C virus (HCV) infection is a significant global public health problem causing liver disease, mainly through sharing of injecting equipment. But in 2016, the introduction of highly efficacious treatment and a global strategy to eliminate HCV by 2030 ignited coordinated action. Australia is on track to HCV elimination by ensuring universal access to treatment, particularly among people who inject drugs (PWID), the most at-risk population of HCV infection. However, alcohol is an equally significant risk factor of liver disease that has been given scant attention in clinical practice, despite the magnified risks among recently treated PWID.

Using an embedded, concurrent mixed methods study, secondary data collected by the Treatment and Prevention Study with PWID in Melbourne, patterns of alcohol consumption before and following treatment were compared. Additionally, predictors of hazardous alcohol consumption are identified. Then, in-depth interviews were conducted with treated TAP participants to explore their lived experience with alcohol consumption following HCV treatment.

Patterns of alcohol consumption may be higher after treatment due to the following predictors: unstable accommodation, single, male sex, low socioeconomic position. Lived experience may be informed by both internal factors and external social determinants of health. Findings would be integrated to inform future alcohol-based interventions in clinical practice.

Anjali Kumar, Sarvatha Mukundan & Kiera Taylor

Monash University, Clayton Campus

The social, cultural and health implications of migration on Hindu Indian women's menstrual practices in Australia

Hindu cultural practices often transcend religious significance and are ingrained in the everyday life of many Hindu Indian migrants in Australia. Among such practices, and of considerable interest to the current study, is the tradition of menstrual segregation commonly practiced in many countries, and its social, cultural, and health implications. In a western context, menstrual segregation is negatively viewed, and has attracted attention via media outlets that have highlighted feminist and human rights perspectives on the practice. These perspectives contribute to negative generalisations about Hindu people, and furthermore neglect the meaning and religious significance Hindu women ascribe to their menstrual practices. The study will be conducted in partnership with local migrant resource centres, and aims to understand the changes in Hindu migrants' menstrual practices upon transitioning to Australia, as well as the factors that influenced or resisted change. This grounded theory study will use semi-structured interviews to examine the perspectives of 20-30 migrant Hindu women aged 18-55 years old in Melbourne's south-eastern suburbs, and will be analysed using the three levels of coding primarily used in qualitative studies: open, axial, and selective coding. The results will highlight the individual experiences of Hindu migrant women, which may be beneficial in assisting other Hindu migrant women to navigate their new cultural landscape, balance acculturation and cultural preservation, and encourage positive mental and physical health.

Session 16C - The Chemistry of Pollution

Mathew Baker

Monash University, Clayton Campus

Causal Responsibility Attributions in a Unique Pollution Setting

Causal responsibility attempts to assign a justified rating of responsibility to a cause of an effect. People attribute responsibility to causes constantly and further understanding of how they do this is essential to legal reasoning, policy-making, and causal cognition, among others. Previous research indicates that whether the cause is necessary and/or sufficient for the effect to occur and the sensitivity of the cause-effect link to changes in background conditions, are taken into consideration when attributing responsibility. This study explores how participants' responsibility attributions interact with these concepts and provides a unique experiment setting in which to investigate further, described as follows. Two companies dump pollutants into a reservoir and probabilistic noise, emulating background factors, can increase or decrease the level of pollutants in the reservoir. An ecological disaster will occur if the level of pollutants in the reservoir reach a certain

threshold. Participants were shown a series of cases varied by the amount each company dumped and asked to rate the responsibility of the companies for the disaster. Two models to predict participants responsibility attributions are proposed. One apportions the probability of the effect occurring to the causes while the other uses a measure of the necessity and sufficiency of the cause to predict attributions. Preliminary analysis indicates that participants are sensitive to both the necessity and sufficiency of a cause. This could have implications for the numerous psychological and philosophical theories that only consider one of these factors. Evidence that the background conditions influence responsibility attributions would help explain the results of previous research.

Session 16C - The Chemistry of Pollution

Jasmina Begam Khalikuzzaman

Nanyang Technological University, Singapore

DEVELOPMENT OF NEW ROUTES TO HYDROPHOSPHINATION: AN INVESTIGATION INTO TANDEM HYDROPHOSPHINATION OF CONJUGATED SYSTEMS

Tandem double hydrophosphination of $\alpha,\beta,\gamma,\delta$ -unsaturated-1,3-Indandiones has been established. The reaction conditions were optimized and excellent diastereoselectivity has been achieved. Extension of the substrate scope and mechanistic investigations were performed. The stepwise manner of the double P-H addition was established and characterization of the intermediate monophosphine was completed. Based on the mechanistic investigation, the 1,6-addition product was produced first which can be proven by analyzing the ^1H , ^{13}C and $^{31}\text{P}\{\text{H}\}$ NMR spectra.

Session 16C - The Chemistry of Pollution

Lee Ming Yang

Nanyang Technological University, Singapore

Too small to matter? Transformation and eco-toxicity of nanomaterials

Nanomaterials encompass a novel class of materials that are gaining popularity in consumer goods and various industrial applications – most notably for their unique properties compared to conventional materials. However, over the course of nanomaterials' lifetimes, the body of the product inevitably degrades, releasing nanoparticles into the environment. These particles are then exposed to environmental parameters, undergo physiochemical transformations and finally accumulate in the environment, possibly leading to various eco-toxicity effects. As a result, a significant number of studies have focused on identifying the possible transformations and environmental risks of nanoparticles, with the ultimate goal of ensuring safe and responsible application of nanomaterials in everyday products. This review aims to consolidate the results from previous studies related to each stage of the pathway of nanoparticles from product to environment. We chose to narrow our scope down to the top 5 most prevalent nanomaterials (nano-TiO₂, nano-silica, nano-zinc, carbon nanotubes and nano-silver) in the near future, based on recent market data. Subsequently, the review focuses on: i) past models developed to estimate environmental concentrations of nanoparticles, ii) the possible physiochemical transformations and eco-toxicity effects specific to each nanomaterial selected, and iii) a discussion to identify potential gaps in the studies conducted and recommend areas where further investigation is warranted.

Session 16D - Culture & Stories

Eliot Vogel

Monash University, Clayton Campus

iDocs: the future of storytelling

iDocs, or 'Interactive Documentaries', are a new and fascinating field of media presentation. They allow the viewer to engage with visual, aural and potentially more learning styles in the same narrative. By combining a multitude of stimuli, such as text, voice, animation and video to a regular narrative, iDocs such as Bear71, the first person story of a bear living in a Canadian reserve and Snow Fall, a story about an avalanche and the people that were caught in it, can create an increased interaction between the story and the viewer. The highly positive ratings and comments given for both works indicate that they are extremely engaging. This begs the question: Can the iDoc format increase user engagement, enjoyment and the speed of learning and memorization? While this format of presenting information is relatively new, this report aims to take Bear71, Snow Fall and pair them with similar paperback narratives. Four stories, two of which will be iDocs, and two regular articles, will be part of a survey to test how interactive each of the stories was, and which one was more interesting and interactive for the average viewer, along with which format made the information more digestible and easily memorable. Owing to the multiple forms of engagement, one can hypothesize that the iDoc will be a valuable and effective method of portraying information in the future, and potentially a method that can be utilised to revolutionize the presentation of narratives in the modern digital era.

Chia Hui Ning

Nanyang Technological University, Singapore

Analyses of Relationship between Text and Visual in a Series of Three Picturebooks by Jon Klassen

The aim of this paper is to examine the relationships between text and image in picturebooks for children. A series of three picturebooks by Jon Klassen were selected by personal taste, recognition, and quality, and analysed from the dual perspectives of literature and art. A framework of text and picture interactions (reinforcing, complementary, reciprocal, and establishing) was surfaced in a review of literature and used to explore the relationships between text and image in the books. The analyses found that only the complementary and reciprocal interactions exist between both semiotic modes and that often text image interactions extend beyond each double-page spread and occur between the spreads. Thus, a reader's developing contextual knowledge plays a critical role in the construction of the narrative yet is unaccounted for by the framework. Furthermore, the reciprocal relationship often cues humour and irony which rests on the reader's ability to infer and predict from textual and visual cues. The analyses also surfaced the importance of wordless spreads in Klassen's picturebooks, which are not reflected in the framework. These are thought to serve as reflective spaces for the characters, as well as for the readers, to reflect on the narrative. Therefore, this paper proposes a new category for the framework – the 'reflective relationship'. While the text and image interaction framework proved useful in analysing the constructedness of the picturebooks, it could neither account for the reader's building of contextual knowledge through reading nor the space for reflection provided by wordless spreads.

Shaun Lim Tyan Gin

Nanyang Technological University, Singapore

This paper provides an insight to the toponymy of the Abui community living in Alor Island. The Abui, translated literally into 'mountains' or 'enclosed space', are mountain people and the Abui language is a Papuan language spoken in the Alor-Pantar Archipelago (East Indonesia) by around 17, 000 speakers. This paper aims to investigate the influence of Abui plant names on place names in Alor Island. Current research on how botany shapes toponymic patterns in Alor Island remains scant – an area this research intends to tackle. Using field linguistics and language documentation methods, the author, together with a local consultant, have collected a list of twelve horticultural and agricultural plants common to the Abui people and thereafter, matched them with toponyms in Alor Island. The data was recorded in a database which noted the type of place name, its location, the agricultural and horticultural use of the landscape, and where possible, the etymology and/or oral stories surrounding the place name. This paper proves that Abui toponyms in Alor Island are mostly transparent, named after horticultural and agricultural plants found in the area, with horticultural plants like mea 'mango', wata 'coconut', and kanaai 'canarium' being the most common toponymic sources. It is hoped that the evidence and analysis in this paper can be used as a starting point for further research on the links between Abui botany and toponymy.

Bernice Leong Wan Kay

Nanyang Technological University, Singapore

Subtle Racism in Singapore

In Singapore, the Chinese is the majority group while the Malays, Indians and other races are the minority groups. Singaporeans are surrounded by the narrative that we are “multicultural”, however there may be subtle racism of the majority group towards the minority groups. The Intergroup Contact Theory proposes that certain prejudices the majority group has towards the minority groups can be alleviated through more frequent contact between the racial groups. Furthermore, the Common Ingroup Identity Model proposes that the effectiveness of the Intergroup Contact Theory can be moderated by re-categorizing Singaporeans in their respective racial sub-identities into a single, more inclusive Singaporean identity. Specifically, the research examines 3 types of relationship between variables – (1) superordinate identity and sub-identity, (2) superordinate identity and frequency of contact between racial groups, (3) superordinate identity and prejudice of majority group towards minority groups. Interviews and 2 stages of survey launch were conducted. Thereafter, results were analysed and their implications on subtle racism in Singapore were discussed.

Natasha Miles

Monash University, Clayton Campus

Ultrasound on the Threshold of Change - The Transformation of General Sonography in Thailand

General sonographic practice in Thailand is undergoing major reform. Previously, comprehensive sonographic examinations – performed by sonographers in Australia – were undertaken by radiologists. Ultrasound imaging was expensive, rurally inaccessible, and strained the radiologist workforce. A postgraduate program formed in collaboration with Monash University was created to address these issues.

This research, carried out between Dec 10-21 2018, aimed to examine the necessity, pedagogical method, outcomes of this program and scope of practice of sonographers in Thailand. The inaugural class of three students, their program coordinators and instructors were observed delivering the program on-site in Bangkok. Anecdotal evidence was collected through informal, non participant observation and interviews, with data used to formulate a reflective journal. The collected data forms the basis of a fourth year capstone research paper being written and developed in 2019.

Onsite in Bangkok, didactic, Thai-English lectures and scanning workshops provided clinical knowledge for program participants. Student sonographers performed preliminary comprehensive exams, with physicians reviewing and rescanning abnormal ultrasound appearances. The primary challenges appeared to be selection and dissemination of graduates into rural areas, and workplace adjustment to the shifting sonographer role.

The current paper informed by these findings is being developed in conjunction with an international professional body, the International Society of Radiographers and Radiological Technologists (ISRRT). It is an ethically approved survey examining the scope of practice for sonographers worldwide, and its impact upon global standards of practice. '

Sarah Bunnewell

University Of Warwick

Are Measures of Follicle Stimulating Hormone Associated with Recurrent Pregnancy Loss: A Systematic Review and Meta-Analysis

Background:

Recurrent Pregnancy Loss (RPL) affects 1-2% of reproductive-aged women; in around half of cases no explanation is found. Ovarian Reserve Tests (ORTs) are hypothesised to be indicative of oocyte quantity and quality and could be linked with RPL. This systematic review and meta-analysis aims to evaluate the association between Follicle Stimulating Hormone (FSH), a widely used ORT, and RPL.

Methods:

Database searches identified 4386 publications. Two reviewers independently screened for eligibility and the data of 13 studies was extracted for inclusion in qualitative synthesis. Eligibility criteria for quantitative synthesis was; FSH measured in women with unexplained-RPL (URPL) compared to non-RPL or explained-RPL (ERPL) controls. Unpaired t-tests were used to compare means in 10 eligible studies. Four studies were included in meta-analyses; Odds Ratio (OR) and 95% Confidence Intervals were calculated.

Results:

Women with RPL had significantly higher FSH levels when compared to fertile controls with no history of RPL (7.47 ± 2.72 , 6.68 ± 1.51 , $p=0.0001$). A significantly higher proportion of women with URPL had elevated FSH (>10 mIU/mL) when compared to ERPL controls (33.01% vs 20.50%, $p=0.0098$). Meta-analysis revealed that in women with elevated FSH, the prevalence of URPL was non-significantly higher than in women with Normal FSH (OR 2.69 [0.75, 9.62], $p=0.13$). Subgroup analysis revealed that this higher prevalence was also non-significant when ERPL controls were used but significant compared to non-RPL controls.

Conclusions:

Current literature indicates some association between FSH and RPL but further research is required to establish whether elevated FSH levels are predictive of further pregnancy losses in women with unexplained RPL.

Session 17A - Medicine & Biochemistry

Sallu Dawo & Sophie Haughton

University Of Warwick

What influences medical students in choosing a surgical career?

Background:

In 2016, Higher Education England reported a 24% decline from 74% of FY2 doctors entering higher training over five years with an increasing proportion taking a career break from medicine. [1] General and Vascular Surgery ST3 posts experienced the lowest fill rate at 86.5% compared to 100% in previous years. [2] Two systematic reviews on factors dissuading a surgical career highlighted poor work-life balance, limited theatre exposure and gender discrimination. [3,4]

Aim:

Cross-sectional study aimed at exploring factors affecting surgical career choice, career aspirations and confidence levels in managing surgical presentations at a UK-based medical school.

Method

Fifty-eight medical students from Warwick Medical School attended a one-day course organised by foundation doctors involving case-based discussions, simulated post-operative complications and surgical skills. Candidates consented to complete pre- and post-course questionnaires on career aspirations, deterring and promoting factors to a surgical career and confidence levels on six surgical presentations.

Results:

Theatre experiences were most memorable with 65.1% observing and 32.6% assisting. Poor work-life balance was the major deterrent (58.8%) followed by high competition rates (27%). The ratio of pre- and post-course career preference was not statistically different (0.41, $p=0.991$). Confidence levels increased in all six surgical case presentations.

Discussion:

Approximately 25% of this cohort were interested in pursuing a career in surgery, a majority of which were women. Poor work-life balance was the major deterrent (58.8%) followed by high competition rates (35.3%). Facilitating hands-on theatre exposure for medical students and junior doctors may tackle declining recruitment rates.

Joohee Kim

University Of Warwick

Inheritance of adaptive maternal effects through the germ-line

The research is based on the inheritance of adaptive maternal effects through the germ-line. This is based on the trauma experienced by the parental generation that can cause the transmission of psychiatric diseases to the offspring. However, little is known about how neuronal activity results in diseased offspring. A new model system, which will allow the easy monitoring of how environmental stress affects neuronal activity and induction of visible characteristics in the offspring will be used. The hypothesis is that the environment of the mother *Auanema freiburgensis* (roundworm) determines the type of offspring produced. Under normal conditions, the mother produces stress-susceptible progeny. However, when the mother is stressed, she produces stress-resistant offspring. In this project, a variety of candidate chemicals will be experimented on the roundworms to disrupt neuronal signalling to identify chemicals that are involved in the production of stress-resistant offspring. Alternatively, modern genome-editing technologies (CRISPR-Cas9) will be used to disrupt candidate genes involved in this process. These offspring are easy to distinguish because of their shape and colour. These data indicate that an environmental signal is detected by neurons, which transmit the information to the germline. The goal of the project will be to test candidate molecules that mediate the transmission of information between the neurons and the germline. Since there is an international community of researchers examining roundworms as model organisms for physiological study, the data obtained in this project may be used as pilot results and may add to the existing knowledge base.

Session 17B - Long Term Health Conditions

Mohammadmehdi Adhami

Monash University, Clayton Campus

Utilising markers of thyroid function and autoimmunity – a step towards personalised thyroid cancer management

Purpose: Indeterminate fine needle aspiration cytology (FNAC) imposes challenges in the management of thyroid nodules. This study aimed to examine whether preoperative anti-thyroid antibodies (Abs) and TSH are indicators of thyroid malignancy and aggressive behaviour in patients with indeterminate FNAC.

Methodology: This was a retrospective study of thyroidectomy patients from 2008 to 2016. We analysed Abs and TSH levels, FNAC and histopathology. Serum marker levels were categorised as 'Undetectable', 'In-range' if detectable but within normal range, and 'Elevated' if above upper limit of normal. 'Detectable' levels referred to 'In-range' and 'Elevated' combined.

Results: There were 531 patients included. Of 402 patients with preoperative FNAC, 104 (25.9%) had indeterminate cytology (Bethesda III-V) with 39 (37.5%) malignant and 65 (62.5%) benign cases on histopathology. In the setting of indeterminate FNAC, an increased risk of malignancy was associated with 'Elevated' thyroglobulin antibodies (TgAb) (OR 7.25, 95%CI 1.13-77.15, P=0.01) and 'Elevated' thyroid peroxidase antibodies (OR 6.79, 95%CI 1.23-45.88, P=0.008). Similarly, while still 'In-range', TSH > 1mIU/L was associated with an increased risk of malignancy (OR 3.23, 95%CI 1.14-9.33, P=0.01). In all patients with malignancy, the mean tumour size was 7.79 mm larger in those with TSH > 1 (P=0.03); furthermore, in PTC patients, 'Detectable' TgAb conferred a 4x risk of lymph node metastasis (95%CI 1.03-13.77, P=0.02).

Conclusion: In this cohort, in indeterminate FNAC patients, Abs and TSH were associated with an increased risk of malignancy. Additionally, TgAb and TSH were potential markers of aggressive biology. As such, they may be diagnostic and prognostic adjuncts.

Session 17B - Long Term Health Conditions

Paige Stevenson

University Of Leeds

Controlling the immune response in the Alzheimer's diseased brain

Microglia cells are the immune cells of the central nervous system; they play a key role in responding to infection and damage within the brain where they become activated to respond to the insult and restore conditions to normal. However, chronic activation of microglia is thought to be damaging and contribute to the pathology of neurodegenerative diseases such as Alzheimer's. Microglia can exist in a number of phenotypic states including a dormant non-activated state, an anti-inflammatory and a pro-inflammatory state. The pro-inflammatory state is believed to be the phenotype that contributes most to neuronal damage and chemicals that can promote the anti-inflammatory state appear to have potentially therapeutic value. We will use a number of inhibitors of specific pathways in microglia cells to characterise the extent that these compounds influence the resting microglia phenotype as well as the microglia response to activating stimuli such as lipopolysaccharides and oligomeric Amyloid beta. We will measure the expression levels of specific markers associated with pro-inflammatory and anti-inflammatory states, such as the cytokines IL-6 and IL-10 respectively, to determine the responses of microglia to specific chemical treatments. Work will be conducted in a laboratory environment, using cell cultures and techniques such as PCR, a method of producing multiple copies of DNA. This will help us to achieve our aim of understanding how we can use specific chemical inhibitors to fine tune microglia response and provide potential treatment to those with neurodegeneration.

Session 17B - Long Term Health Conditions

Haydn Simper

University Of Leeds

A Physical Simulation of the Human Defecation System for the Investigation of Treatments for Faecal Incontinence

Faecal Incontinence is a huge problem globally. With an array of causative factors contributing to its prevalence, the condition is complex, with a limited choice of treatments to improve the quality of life for those it afflicts. A common factor in the pervasiveness of this disorder is the weakening of coordinated defecatory muscles such as the puborectalis, pelvic floor and the internal/external anal sphincters.

To improve the quality of life of patients who exhibit faecal incontinence, numerous innovators have developed novel ways to restore function to defective defecatory systems. These treatments frequently exhibit implants which either actively or passively mimic the function of the anal sphincters, such that control of defecation is somewhat restored. One proposed treatment, undergoing exploration by a medical textiles company, affects a passive constriction around the anal canal. The implant, currently in a development phase, employs a complex woven structure which will be introduced in a minimally invasive surgery and over time integrate with tissues to mimic the occlusive pressure normally exhibited by a healthy sphincter.

In order to test such a proposal, this research involves the construction of a defecation simulator, enabling the proposed device and existing treatments to be compared to healthy and diseased baselines. The system will be used to evaluate: the occlusive pressure of the sphincter; mass retained; and time elapsed until breach of occlusive pressure, in each treatment scenario. Resultantly, development of the proposed device can be informed, potentially delivering a much-needed long term improvement in the treatment of faecal incontinence.

Session 17B - Long Term Health Conditions

Kevin Wang

University Of Leeds

Deep learning algorithm for colorectal cancer detection

Background

Colorectal cancer (CRC) is the second largest cause of cancer mortality in the UK. With early diagnosis and appropriate treatment, 57% of patient can survive for 10+ years. Both diagnoses and treatment decisions are made manually on glass slides or digital slides. Manual analysis of tissues requires visual inspection of highly complex cellular structures, which is time consuming, subjective and prone to error. Artificial intelligence such as Deep Learning (DL) has the potential to automate this task, improving on speed, objectivity and accuracy. Current research at the University of Leeds uses DL algorithms to classify CRC tissue in order to automatically predict response to therapy. However, it requires cancer tissue to be annotated by a pathologist prior to analysis which has the same disadvantages.

This project aims to develop a DL algorithm to detect CRC on digital slides, as a pre-processing step for downstream image analysis.

Method

8000 CRC images from St James Hospital were colour-normalised before training the VGG19 network. The model is trained with 5-fold cross validation to identify 8 categories: tumour, stroma, lumen, muscle, mucin, vessels, necrosis and inflammation. The model will be validated using an external dataset from the National Cancer Institute. A heatmap will be generated to representing probability of cancer cells on a whole-slide image and compared with existing pathologist annotations.

Results

The algorithm is still being developed at the time of submission. Preliminary accuracy after the first round of training is 0.91 on the training set and 0.59 on the validation set.

Santiago Beltran Diaz

Monash University, Clayton Campus

Bone Automated Segmentation and Interactive Length Interrogation in Standardized CT-scans (BASILISC)

Analysis of skeletal components of model organisms is essential for the understanding of limb development and repair. Differences between samples can be quantified using limb bone length as a parameter for comparison. Current approaches are very labor-intensive, as they require careful dissection, skeletal preparation, flat mounting and imaging, and manual measurement. Alternatives include microCT (CT) scans for visualization of skeletal components, followed by 3D modeling and analysis. Nonetheless, these techniques require heavy user interaction, thus making them time consuming. We propose standardized CT scanning, followed by image processing with Mimics software which also allows for data exporting, facilitating subsequent analysis.

The pipeline consists of acquiring CT data as DICOM files, followed by segmentation of long bones of the limbs, and measurement of each element. These steps have been optimized, ensuring the orientation of the samples and scanning parameters are standardized, which allows for a common threshold range across different samples, for ease of automation through Python scripting. Once segmentation has taken place, a center-line is fitted to each element, and the length of all the lines is exported within a comma-separated-values file. The developed approach is semi-automatic, where limited user interaction is required, reducing significantly the time taken from sample collection to bone measurement. Another advantage of using DICOM files is that metadata is preserved, including scale information. As proof of concept, mouse models with left-right asymmetry, at different developmental stages are being used in the optimization of the script designed to execute image processing and analysis.

Session 17C - Innovations in Technology

Akash Romesh

Monash University, Clayton Campus

The Past, Present and Future of Rechargeable Technology

With the advent of portable smart devices and electric vehicles, rechargeable batteries have secured the attention of the scientific community. Battery storage power plants have been used to store power temporarily and control power in peak demand times to stabilize the grid. Current lightweight rechargeable Lithium based batteries make them ideal for use in planetary landers and rovers. Rechargeable batteries, Lead-acid batteries in specific, have been used since 1859, first invented by French physicist Gaston Plant and are still used in vehicles due to its low manufacturing cost and ability to provide high starting currents. Over time rechargeable technologies have evolved from Lead-acid batteries to Nickel-Cadmium leading to Nickel-metal hydrides and finally Lithium ion batteries. Global interests to develop powerful portable electronics has sparked research races between companies to produce the 'better' battery and has led to Lithium-Sulfur and Sodium ion batteries. Present research focuses on increasing battery capacity, energy density and specific energy while focusing on materials that preserve optimal performance for a greater number of charge cycles. Perfecting these parameters requires extensive research in controlling internal reactions, preventing deposition of material and selecting suitable electrodes and stable electrolytes, resulting in an efficient battery capable of being used in portable devices and small and large scale power storage. This research focuses on analysing throughout the history of rechargeable batteries up to present technologies and discussing current developments while searching for common links between previous literature to predict the future of rechargeable technology.

Session 17C - Innovations in Technology

Jessica Coldrey

Monash University, Clayton Campus

From Art to Infrastructure: Creativity and the Plastic Waste Crisis in Australia

With the emergence of new technologies for manufacturing with recycled plastic, we are presented with opportunities for innovation which can assist us in bettering society and our shared environment. This body of research draws on Australian case studies which capture the ingenuity and creative spirit of professionals working in the recycled plastics sector through an integrative literature review. Projects selected are provided as examples of industry best practice due to their focus on local resource use, significant project scale, feasibility for replication and positive environmental impact. Information is sourced from journals, media releases, and statistics on recycling from the Australian Department of the Environment and Energy. Framed from a 6B - Sustainability and social science perspective, this project heralds the essential role creativity plays in the future of recycled plastics - one of the key environmental issues of our generation. The circular economic model is emphasised with reference to the success of featured projects ranging from artistic and design settings to engineering and infrastructure. In highlighting the imagination required to build a greener future, a path forward is outlined for finding new and beneficial ways to stimulate manufacturing with recycled plastics in Australia.

Raphael Morris

Monash University, Clayton Campus

How it could have ended: why choices matter in fiction

There is much philosophical work about truth in fiction. However, no existing work explains why – for example – without the hero, the villain would have won.

Fortunately, there are philosophical frameworks to address similar questions about the actual world, like why a glass would break if it were dropped. In this presentation, I apply these frameworks to the fictional case to develop a philosophical foundation for discussions about how some details of fictions depend on others.

Specifically, I draw on the work of David Lewis (1973) on how to understand sentences of the form ‘If it were X, it would be Y’. Lewis suggests we understand these as claims about alternate realities called ‘possible worlds’. For example, ‘If I were to drop a glass, it would break’ is true just in case in all the possible worlds most like our own world where I drop a glass, the glass breaks.

If we consider fictional worlds as possible worlds much like our own, we can use a similar strategy. Consider the worlds most like the world of the story, but where the hero just stays home. In all these worlds, the villain wins. This explains why, without the hero, the villain would have won.

Actions and events in fiction matter to us because of how the fiction would have gone without them. Explaining the effects of changing details of a fiction justifies why those details are meaningful and provides a philosophical basis to understand narrative themes from heroism to tragedy.

Aidan Ryall

Monash University, Clayton Campus

The Social Ontology of Historical Objects: How to Avoid Destroying the Lewis Chessmen

For an object to be acquired by the British Museum it must first meet one obvious criterion: it must be a historical object. The Lewis Chessmen, for example, must actually be the set of chess pieces that were made in the 12th century out of walrus tusk by some certain craftsmen. Curiously, there seems to be a distinction that must be made between the Lewis Chessmen as they exist today and the chess pieces as they originally existed in the 12th century. Although well crafted and clearly valuable in a financial sense, no contemporary of their original creator would have argued they deserved to be treasured and preserved for their historical value: it didn't exist yet.

Drawing on Ásta's conferralist account of social construction, Amie Thomasson's ontology of artefact kinds, and using philosophical analysis, I argue that these differences are not insignificant changes in relational properties; they are a change in kind. This presents a problem for our study of history. Historians traditionally look to material objects as a way of authentically accessing the past, and emphasises continuity of identity across time. The Lewis Chessmen must be the original chess pieces, and they are in a material sense, but in classifying them as 'historical objects' historians have arguably engineered a transformation in their ontological status.

I argue that each Lewis Chessman must consist of two coincident, entirely overlapping objects: one ordinary object (the chess piece), and one historical object (the 'Lewis Chessman'). Little philosophical attention has been paid to the ontological consequences of historical practices, nor has historical practise typically been viewed as a fruitful enquiry for social constructionists. This paper, therefore, presents an entirely novel problem and a new argument for the necessary existence of coincident objects under specific social circumstances.

Kwetsimani Mathebula

IIE MSA

THE INADEQUATE LAND TENURE SYSTEM UNDERS SOUTH AFRICAN LAW

The failure of the South African legislature to pass a land tenure legislation to formalize communal land rights of residents of tribal lands is worrying.

This is particularly concerning in light of the need for security of land tenure among residents of tribal lands, who still live on the lands on the basis of permissions to occupy, which get issued by tribal authorities pursuant to communal land right arrangements in terms customary laws of South Africa.

Since the enactment of the Communal Land Rights Act 11 of 2004, which was intended to offer redress to people whose tenure of land is legally insecure as a result of past racially discriminatory laws or practices, the law makers have failed to bring it to fruition because of constitutional concerns

Although the need for redress was identified in terms of Section 25 (6) of the Constitution of the Republic of South Africa, 1996, the limited promotion of economic development in terms of the Interim Protection of Informal Rights Act, 1994, is not enough as it comes short of providing individual ownership rights to the residents of tribal authorities.

This paper argues for the reform of land tenure in a way that will protect land tenure on a large scale.

Kamohelo Ngati

IIE MSA

THE UTILITY OF 'PIERCING OF THE CORPORATE VEIL' IN ADDRESSING CORRUPTION IN STATE-OWNED ENTERPRISES WITH PARTICULAR FOCUS ON STATE CAPTURE.

Recent revelations at the Zondo Commission on State Capture in South Africa concerning rampant corruption in key state-owned enterprises like Transnet SOC Ltd and Eskom Holdings (SOC) Ltd starkly shine a spotlight on the need for holding the wrongdoers personally responsible for the loss suffered by these enterprises.

Any efforts to hold the wrongdoers personally liable can be facilitated by the application of the Companies Act, 71 of 2008, to those entities as they are incorporated in terms of that Act.

According to section 20(9) of the Act, a court may declare any company not to be a juristic person and make any further order that the court considers appropriate if the incorporation of the company, any use of the company, or any act by or on behalf of the company, constitutes an unconscionable abuse of the juristic personality of that company as a separate entity.

Since both Transnet and Eskom are incorporated in terms of this Act, the current boards and/or the state can use this section to hold the wrongdoers liable since what they did in perpetrating fraud and state capture constituted unconscionable abuse of those companies as separate legal entities, with rights and obligations appropriate to themselves.

This paper argues that the Act should be used to retrieve some of the misappropriated funds from the wrongdoers.

Monash University, Clayton Campus – Poster Presentation

Poster Session – Tuesday 24th

Silkra Harvey

Monash University, Clayton Campus

Inclusive pedagogical approaches for culturally and linguistically diverse youth in secondary schools in Victoria

The increasing rate of globalization and forced migration has led to increased diversity of students with differing social, cultural, religious and linguistic backgrounds in classrooms across Australia. In order to meet the complex needs of students from refugee and migrant backgrounds, teachers must be adequately prepared, well-resourced and supported by whole-school approaches in order to implement truly inclusive pedagogy strategies and approaches. Against a backdrop of overt and subtle racism in broader society and within schools, students from diverse backgrounds, and refugee students in particular, face a process of Othering that can detract from educational experiences.

This small-scale study will be conducted in a secondary school with a large migrant and refugee population, located in the southeastern suburbs of Victoria, to address the perspectives of teachers in relation to implementing inclusive practice for culturally and linguistically diverse youth, and if these practices help to overcome the Othering experienced by many students of diverse backgrounds. This will likely encompass semi-structured interviews and classroom observations, which will be analysed according to ideologically based processes of Othering.

This research expects to identify barriers and enablers to implementing inclusive practices in the classroom that incorporate refugee and migrant student experiences, which can be used to inform future school and teacher practices.

Kit Ming Foo

Monash University, Clayton Campus

Peer Assisted Learning: Exploring a Vertical Approach

Background: Peer-Assisted Learning (PAL) has become increasingly popular as a teaching strategy in recent times. Since 2009, Vertically Enhanced Study Program Approach (VESPA) Case Nights have been run at Monash University in Victoria, Australia for medical students. These nights are faculty-sponsored events, that through PAL and clinical cases, aim to consolidate the faculty taught curriculum. They also offer the chance for senior students to develop teaching skills through facilitating these cases.

Aim: To characterise the participant perceived benefits and disadvantages of PAL.

Methods: A prospective cross-sectional study was undertaken amongst VESPA Case Night participants across three case nights. A 30-question instrument with Likert and open-ended questions was designed and applied after each night concluded. 21 of those questions examined the advantages and disadvantages of the case night, as observed by participants. The remaining questions specifically targeted certain groups, such as pre-clinical students, clinical students and facilitators.

Results: 425 questionnaires were completed. Of those, 173 were from pre-clinical students, 156 from clinical students and 96 from facilitators. Overall there was a positive response to VESPA. 76% of participants agreed or strongly agreed that there was an improvement in their clinical reasoning skills. Furthermore, 91% of facilitators felt that this experience encouraged them to contribute to medical education.

Conclusion: VESPA has been shown to be particularly beneficial for all participants, as they identify it to have significant educational value. Further research, such as a cost-benefit analysis could provide further evidence to encourage a greater implementation of this program in an educational setting.

Arti Padiyachi

Monash University, Clayton Campus

Burnout among Emergency Department Nurses: A systematic Review

Abstract

Introduction: Burnout in Emergency Department nurses is a major problem for the health sector globally and Australian hospitals are no exception. Nurse burnout is a debilitating condition caused by chronic overwork and a sustained lack of job fulfillment and support.

Objective: This systematic review will explore the notion of Burnout among Emergency Department Nurses, factors contributing to it, impact on their health and practice and the coping strategies used.

Inclusion Criteria: Peer reviewed studies which focus on Qualitative data, undertaken in English from 2009 to 2019 about Burnout among Emergency Department Nurses.

Methods: The Ovid, MEDLINE and CINAHL plus databases will be searched initially, then studies will be screened by their title and abstracts. Key terms used will be identified and a PICO formulated. All identified keywords and key terms will be searched through Ovid MEDLINE, PsycINFO, Emcare, CINAHL plus and EMBASE. Reference list of all studies identified will be searched for additional studies that may not have been identified through the database searches. Data collected will be categorized using the JBI-QARI tool (2014) and subjected to a meta-aggregation to create a single comprehensive set of synthesized statements to describe Burnout in emergency department nurses.

Conclusion: The factors contributing to Burnout among Emergency department nurses will be articulated after the synthesis of data, how this has affected their health and practice and the coping strategies used will be discussed.

Gia Khang Tran

Monash University, Clayton Campus

Knee extensor strength training improves knee pain and functional performance for people with knee osteoarthritis: A systematic review and meta-analysis

Objective: To investigate the effectiveness of knee extensor strengthening on knee pain and functional performance in people with knee osteoarthritis (KOA) and investigate the relationship between changes in knee pain and changes in functional performance (FP) after training.

Data sources: Randomised controlled trials, controlled clinical trials and crossover trials were identified from a systematic search of five electronic databases MEDLINE, EMBase, EMCare, CINAHL, Cochrane Central Register of Controlled Trials (CENTRAL) up to 20th April January 2019. Included trials compared knee extensor-specific or general lower limb strengthening programs to interventions without knee extensor strengthening, reporting at least one pain outcome and one FP measure.

Review methods: Data was extracted by two independent investigators. Standardised mean differences (SMDs) and 95% confidence intervals (CI) were calculated for pain and FP measures using a random-effects model. The correlation between change in pain and FP was then determined.

Results: Nineteen trials (985 participants, 17 meta-analysis) were included. Knee extensor strengthening significantly reduced knee pain (SMD=-0.85, 95%CI -1.12, -0.57, $p < 0.01$) and improved functional performance (SMD=0.76, 95%CI 0.49, 1.02, $p < 0.01$) compared to interventions not involving knee extensor strengthening. The greatest improvement in functional performance was observed for walking-based tests, particularly gait speed. There was no significant association between change in knee pain and change in functional performance.

Conclusion: Knee extensor strengthening reduces knee pain and improves functional performance for people with KOA. Heterogeneity within populations, particularly KOA severity, may explain the lack of association between change in knee pain and functional performance following strengthening.

Ilianna Ginnis

Monash University, Clayton Campus

Space and disability: Empathetic interiors and technological advancements

What if the interior could extend to both function and enhancement of life? How can the interior form new diverse relationships with people with disabilities? Interior designers and architects are able to explore experimental means which can assist people with diverse disabilities to connect to the intentions of the architect in space, forming a immersing relationship in space and time.

Through developed technology, such as headsets, wearable architectural pieces and advanced technological connections, designers and architects create a new system where people are able to both produce new experiences connecting with space and access the life of someone with a disability, formulating architecture with emotive perspective. Creating these spaces not only enhances the social participation with someone with a disability, but also, integrates space, time and technology to create a greater relationship with architecture, increasing the quality of life. "Enriching Our Understanding of Architecture through Disability Experience." (Ann Heylighen, 2013), explores the relationship between environment, human functionality and the combination of strategies for someone with a disability and senses.

This research explores space's ability to respond to the sensory needs of the person. Adding this technological layer to space, people with disabilities are able to communicate and engage, constructing a new tangible and intangible experience.

In this digital age, the interior is able to deliver, acknowledge and meet these diverse needs allowing space to stimulate a response for empathy, creating perspective and understanding individuals with disabilities, both physical and intellectual. This new advanced digital age adds ability to disability.

Poster Session – Tuesday 24th

Bill (Vu) Ho

Monash University, Clayton Campus

Factor I Modules of Complement Component 7 Are Not Required for Membrane Attack Complex Formation

The complement system is composed of different plasma proteins acting alongside both the innate and adaptive arms of vertebrate immunity to fight pathogens. One of the complement effectors, the membrane attack complex (MAC), is a hetero-oligomeric asymmetric pore responsible for the lysis of various target cells. The MAC contains complement components C5b, C6, C7, C8 and finally 16-18 copies of C9 which bind in a sequential fashion, resulting in a beta-barrel structure that punctures membranes. One of the MAC intermediates, C5b7, is a bottleneck of MAC assembly, as it forms the initial membrane anchor. However, the exact mechanisms behind C5b7 formation remain elusive.

Here, we performed a structurally guided characterisation of C7 to determine the importance of the C-terminal Factor I Module (FIM) domains in MAC assembly. Both full length C7 and a truncated variant C7[FIM] could be expressed and purified to near homogeneity for functional analysis. Haemolytic assays of C7 and C7[FIM] indicate both forms are active albeit with diminished activity in the truncated form. We postulate that the C7 FIM domains facilitate initial binding to C5b6. Future studies will determine differences in binding affinities in these two forms of C7 to C5b6.

Poster Session – Tuesday 24th

Yuqi Guo & Charlotte Smith

Monash University, Clayton Campus

Daily Perioperative Delirium Screening of Elderly Patients Admitted for Elective Cardiac Surgery at Cabrini Hospital Malvern

Delirium is a common hospital acquired complication associated with serious harm. Despite this, routine delirium screening is not a standard practice in many Australian hospitals. Our study aims to identify the delirium rate in elective cardiac surgery inpatients aged over 65 using daily delirium screening over three months, and compare it to the delirium rate in all cardiac surgery inpatients without screening in 2018. Additionally, we aim to identify the barriers to implementing daily screening into practice. The 4A's Test (4AT) is a validated screening tool for delirium. Nursing staff were encouraged to conduct daily preoperative and postoperative 4AT on all cardiac surgery patients. Patient demographics, 4AT scores and any documentation of delirium by doctors were collected from the clinical files. 102 cardiac surgery patients were screened and 50 were eligible for the study. The results found a 14.0% incidence of delirium amongst eligible patients using daily screening, compared to 1.36% delirium incidence in all cardiac surgery patients in 2018. These results indicate that delirium is underdiagnosed without screening. However, during the study, the average adherence rate to daily screening was 42%, with the mean days of screening being 4.1 days per patient. Multiple barriers to effective implementation of daily screening were identified, including heavy staff workload causing delirium screening to be a low priority, inconsistent handover of positive screening results, and limited documentation of delirium diagnosis by doctors. More comprehensive education on delirium is therefore necessary to increase awareness and improve adherence before further study in daily delirium screening.

Jason Xu (In Abstenia)

Monash University, Clayton Campus

The clinical efficacy of knee extensor strength training for knee osteoarthritis: A systematic review and meta-analysis

Objective: To determine the clinical efficacy of quadriceps strength training for reducing knee pain and improving quadriceps strength and rate of force development (RFD) for people with knee osteoarthritis.

Data sources: A systematic research of five electronic databases (Ovid MEDLINE, CINAHL, CENTRAL, Embase and Ovid Emcare) was performed to identify trials comparing quadriceps strengthening to either i) no active intervention or ii) other active interventions (e.g. and reporting changes in knee pain, quadriceps strength/RFD).

Review methods: Standardised mean differences (SMDs) and 95% confidence intervals (CI) were calculated for knee pain and quadriceps strength/RFD for both comparison groups using a random-effects model.

Results: Twelve trials (985 participants) were included in a meta-analysis. Quadriceps strength training resulted in large and significant improvements in quadriceps strength (SMD=2.94, 95%CI 1.89 to 3.98, $p < 0.01$, $I^2 = 96\%$) and knee pain (SMD=-1.23, 95%CI -1.76 to -0.69, $p < 0.01$, $I^2 = 88\%$) compared to no active interventions. Conversely, when compared to other active interventions, other active intervention had a superior effect on knee pain when compared to quadriceps strength training (SMD=0.42, 95%CI 0.14 to 0.70, $p < 0.01$, $I^2 = 77\%$). There was no significant difference in quadriceps strength between the two (SMD=- 0.16, 95%CI -0.64, 0.32, $p=0.52$). No studies were found reporting changes in quadriceps RFD following strength training.

Conclusion: Quadriceps strengthening leads to significant improvements in knee pain and quadriceps strength. The low intensity of quadriceps strengthening exercises used in trials may explain the lack of difference in quadriceps strength found between quadriceps strengthening and other active interventions.

Catriona McCallum

Monash University, Clayton Campus

Flipping sea stars: Can the righting response of *Meridiastra calcar* (Echinoderm: Asteroidea) be used as a bioindicator to ecosystem health and anthropogenic stress?

The righting response time (RTT) and mass-size residuals (MSR) were measured in *Meridiastra calcar* in the Mornington Peninsula, Australia to examine organismal wellbeing of sea-stars. These measures were then used to determine if sea-star health status might be a biological indicator (bioindicator) of ecosystem properties, including levels of anthropogenic disturbance and community biodiversity. RRT is important for survival and should be completed as quickly as possible in healthy individuals. MSR is a value that adjusts the mass of an animal to a given measure of size, whereby animals with strongly positive residuals are considered to be in better condition compared with negative residual scores. It was expected that sea star righting response would be slower in areas with higher anthropogenic disturbances, and areas with higher biodiversity, and that MSR would show strongly positive scores in areas with lower anthropogenic disturbance and higher biodiversity. Furthermore, RRT was expected to associate positively with mass of individuals and water temperature. The results suggest that faster RRT do associate with lower anthropogenic disturbance levels. Additionally, high MSR scores showed a significant positive relationship with community biodiversity. The study also confirmed that mass scales predictably with RRT, consistent with previous studies. However, there was no RRT relationship with temperature, although this may be a consequence of narrow temperature range in the study (18C - 25C). To our knowledge, this is the first study to examine righting response time or mass-size relationships in a free-living population of sea-stars. We discuss possible bioindicator implementations of these indices.

Varnika Aggarwal

Monash University, Clayton Campus

Assessment of olfactory function following fetal growth restriction (FGR) in sheep.

Fetal growth restriction (FGR) is a complication of pregnancy describing stunted growth in the fetus. FGR is usually caused by chronic fetal hypoxia and lack of nutrients through the placenta. The fetus adapts to this lack of oxygen by directing more blood towards its brain to protect it. Despite brain sparing adaptations, there is still significant alterations in brain development due to FGR.

This study aims to test the function of the sense of smell and the part of the brain that processes sensory information from the nose. There is a focus on the sensory functions of the nervous system in this study because there has been extensive research regarding the motor and cognitive defects associated with FGR, but none about the sensory deficits. The impact on the olfactory sense will be examined in sheep by inducing FGR surgically and testing their ability to smell and find food while comparing this to unaltered lambs.

The results of this experiment are expected to be statistically significant ($p < 0.05$), showing that the FGR group of lambs collectively takes a longer time to navigate to the food than the control group. This would indicate compromised olfactory ability due to altered brain development as a result of FGR. Follow-up studies could be conducted to test the functions of other senses, such as auditory and visual. Collectively, the results of these studies would allow for better care of FGR babies by contributing to the knowledge pool for FGR.

Manini Bhatia

Monash University, Clayton Campus

Evaluation of various labour factors which may influence the breastfeeding rate in healthy, term newborns

Background: The Victorian Government has established performance indicators as a benchmark for all health services to improve their breastfeeding rates. Latrobe Regional Hospital (LRH) has one of the lowest breastfeeding rates in Victoria (Table 1). This study analysed if different components of labour have an impact on the initiation of breastfeeding and at discharge.

Methods: We performed a retrospective cohort study from March to August 2017, including all babies' 7 weeks gestation, born at LRH. Exclusion criteria were prematurity, transfer to another hospital and medical contraindications for breastfeeding. We established two study groups at the initiation phase and discharge time: infants either exclusively breastfed or not exclusively breastfed. Patients were identified using ICD-10 coding and data was statistically analysed with Stata using the score test for trend of odds ratio and chi square test.

Results: We identified 397 births. Respectively, in 80.1% (n=318) breastfeeding was initiated, and 56.8% (n=255) babies were exclusively breast fed at discharge. Induction of labour had a significant negative impact on the initiation of breastfeeding ($p < 0.05$) but was not significant at discharge ($p = 0.058$). Other clinical intervention such as elective ($p = 0.286$) or emergency caesarean ($p = 0.377$), epidural for vaginal delivery ($p = 0.546$), or other type of anaesthesia ($p = 0.780$) did not have a significant influence on breastfeeding initiation.

Conclusion: These results changed the management in the antenatal clinic. We now provide early education about regular expressing of breast milk from 36 weeks' gestation and have introduced a feeding sheet to improve compliance and uptake in women admitted for induction of labour.

Sumudu Setunge

Monash University, Clayton Campus

The relationship between economic integration and the mental health of resettled refugees in Australia:
A five year longitudinal study.

Context: The number of refugees seeking asylum is increasing globally. Resettlement in countries such as Australia offer one of the few viable options for refugees. The high prevalence of mental health conditions among refugees during resettlement has gained significant attention. There is increasing interest in identifying modifiable socio-economic issues that may influence refugee mental health.

Objective: To examine the association between the economic integration of refugees into Australian society and the presence of mental illness among resettled refugees.

Design: Longitudinal analysis of four annual waves of the “Building a New Life in Australia” survey, an ongoing study conducted between 2013 and 2018. Variables of economic integration (defined as employment, income, financial strain) and mental well-being (defined as Kessler-6 and PTSD-8 score) were assessed.

Setting: Australian cities and rural areas across all states and territories excluding the ACT.

Participants: 2,399 resettled refugees were recruited from the Department of Immigration and Border protection database. 80% of participants remained in the fourth wave and 1,549 respondents participated across all four waves.

Findings: This research is in progress. The presentation will include the descriptive analyses of key demographic information, economic outcomes and mental illness across all four waves. We further aim to present the regression analyses to assess these relationships in order to determine possible associations with poor mental health in refugees.

Implication(s) for Practice: The study findings have the potential to guide policy and practitioner assessments by identifying targets for optimal management of mental illness and the economic integration of resettled refugees.

Poster Session – Wednesday 25th

Muskann Vohra, Twisha Banker & Emma Klein

Monash University, Clayton Campus

A clinical eye for all

Clinical chaperones are medically trained professionals present as a witness, safeguarding both the doctor and patient during medical consultations to mitigate the risk of medical misconduct. Medical misconduct ranges from misdiagnosis and incorrect prescriptions to assault. It symbolises a serious violation of the trust bestowed upon practitioners with misconduct allegations requiring a full investigation. The use of clinical chaperones not only reduces the risk of misconduct but also protects falsely accused practitioners. Chaperones can minimize unnecessary risk to patients and reduce incidences of medical misconduct. A study done by Van Hecke and Jones concluded that "minimizing the risk to patients, wherever the setting, is an important component of good medical practice, and the offer (and uptake) [of chaperones] goes some way to reducing this risk." The Medical Protection Society also indicates that "it is very rare for a practitioner to receive an allegation of sexual assault if a chaperone is present. Unfortunately, benefits that chaperones provide have not expanded beyond academia and into the public domain leading to widespread unawareness. As a result of this significant knowledge discrepancy, we propose an integrated investigation of clinical chaperones using primary and secondary research. Through ICUR, the general public will become more educated about clinical chaperones and their benefits. With this knowledge, all members of society, specifically those belonging to vulnerable groups will become more aware of ways to protect themselves. Higher levels of awareness will lead to more chaperone use thus helping mitigate medical misconduct.

Poster Session – Wednesday 25th

Seema Deb

Monash University, Clayton Campus

Improving access to the delivery of medical abortion in Australian General Practice: what models of care work?

Context: Despite the availability of mifepristone in Australia since 2013 there has been limited integration of Medical Termination of Pregnancy (MToP) into Australian general practice. Understanding the models of care instituted by those GP providers currently providing MToP can help facilitate increased access for Australian women.

Objective: To describe the models of care used by GP MToP providers that facilitate service delivery

Design: A qualitative study will involve thematic analysis of semi-structured interviews conducted with current GP MToP providers.

Setting: General Practitioners in Australia.

Participants: Up to 20 GPs, who provide MToP services in their practice.

Findings: Interviewing and analysis is in progress. The presentation will outline the preliminary results describing the models of care that facilitate GP MToP service provision. This is anticipated to include information regarding the personnel involved, appointment scheduling, training undertaken, professional relationships with pharmacists, pathology and radiology providers, billing practices and referral pathways.

Implication(s) for Practice:

The results of this study will inform a framework for increasing GP MToP provision in Australia, which may encourage other GPs to provide MToP services in their own communities.

These findings are a preliminary element in the NHMRC Centre of Research Excellence in Sexual and Reproductive Health (SPHERE)s body of work to improve MToP delivery and access for Australian women.