Hagsploitation: the horror of female ageing onscreen in 1960s Hollywood

Alexandra Breitsameter
University of Wollongong

"If advertisements are to be believed, human ageing- particularly ageing into old age- is something to be medically and cosmetically treated. In recent decades, however, ageing has become the subject of critical treatment by cultural theorists, who have argued that whilst ageing is ineluctably a biological process, its characterisation as a biological disease has supported its characterisation as a social disease. Not only is older age frequently represented as debilitating to the individual, it is prognosticated to cripple workforces with the 'mass retirement' of Baby Boomers through the 2000s. Based on this, scholars have argued the pervasiveness of an implicit cultural ageism that underwrites biologised narratives of the process of ageing as a linear regression into helplessness and uselessness. Critics such as Margaret Morganroth Gulette (2011) have interrogated these scientistic assumptions that hold that age necessarily equates with decline and have forwarded a culturalist perspective on age that argues that age is structured by ideological discourses and cultural meta-narratives and has been 'over- naturalised' as an identity category. Ageing and ageism has in particular received a great deal of feminist comment, with feminist scholars arguing that it has been culturally constructed as an especially feminine affliction, a gendered coupling implying a strong social, gendered animus toward the aging woman (Sontag, 1997; Russo, 1994; Calasanti & King, 2006). This paper undertakes a close textual analysis of three horror films produced in 1960s America, known in industry and fan cultures as belonging to the sub-genre of hag horrors/ psycho-biddy films, and hagsploitation cinema. It explores how these films exploit the profanity of age in their actresses as vehicles to probe the physical and psychogenic depths of breakdown and decay. It also considers, however, the notion that to read these films straight- that is, as singularly offensive, is to miss the self-reflexivity written into them. Taking cues from previous genre criticism, it will show that the films themselves equally self-exploit to show up audience and cultural expectations and the ideologies that drive them.

In Space, No One Can Queer You Scream

Alison Whittaker
UTS

Critical discourse surrounding queer theory often is concerned with the negotiation of queer codes, examined through the lens of Stonewall and archetypical gay narrative. The conceptually modernist push to normalise and justify queer identity within such spaces has resulted in male, cisgendered, homosexual and white hegemony in queer culture. The chapter shall critically examine the potential in the Queer Space for intersectionality in queer culture through the lens of modernist progress and totalisation campaigns and traditions, rituals and cultural artefacts which have come to exclude other minorities, the indigenous, ethno-cultural, female and transsexual members of the community. Under the key poles of the queer politic as it is contemporarily regarded, disambiguation and domestication, the chapter explores traditional and modern practices which have led to the singularity of queer theory. Initially, the chapter takes the approach of domestication, and all that which lays under domestication, exploring the role queer's modern and scientific history has played in the negotiation of a new queer. It then follows to critically analyse the interplay of overdetermination, and the significance of the development of queer myth with regards

to the counternationality forced upon constituents of other autonomous spaces and politics. Under the construct of disambiguation, which is an enquiry into tradition, the chapter continues the analysis of contemporary queer exclusion by examining the counternationality against mythical norms and the consequences of this counternationality for the intersectional. Part of the development of these traditions and mythical norms is similarly examined under linguistic constructs and civic religious rituals within the Queer Space, the centre for the investigation. The chapter concludes with a pertinent footnotes of the new politic: the oppression of gay, white cisgendered males despite their apparent advantage in queer spaces, and the atomisation of these queer spaces.

Pearls, Sex and Protectionism - Aboriginal-Japanese Sexual Relations in the Northern Australian Pearl Industry, 1918-1939

Annelyse Davison
University of Wollongong

"The thesis is based on accounts of sexual relations between indentured Japanese pearlers, and Aboriginal women, in the coastal and island regions of Northern Australia during the inter-war period (1918 to 1939). These relations were pursued by the Japanese as a result of racial policies regarding mixed race relations and by Aboriginal communities to obtain food, tools, tobacco, and alcohol in exchange for sexual services. My hypothesis aims to both explore the reasons for the vilification of Japanese indentured labourers during this period by reviewing a history of interracial sexual contact history in Northern Australia, as well as question the protectionist policies and attitudes by state and federal agencies, and religious institutions towards the Aboriginal women involved in these sexual encounters. This will be undertaken through an examination of the role of White Australia politics and racial mentality, pre-war tensions, increased Japanese commercial competition in the pearling industry, and religious morality in demonising the men, both Japanese and Aboriginal, involved in the solicitation and victimisation of Aboriginal women. Preliminary conclusions suggest that the treatment of both parties involved stemmed from prevailing perceptions of race, and in the case of the Japanese, also reflected growing fears of conflict in the Pacific. Due to the nature of the research and limited amount of secondary material, the thesis relies heavily on primary sources. These include newspaper articles, sourced from the National Library of Australia's online database 'Trove', archival reports, documents, legal transcripts, and maps from the Department of the Interior and Home Affairs, and NT government, as well as annual reports by the religious institutions in charge of missions in Northern Australia, particularly around Darwin and the Tiwi Islands, from the National Archives."

Boosting Influenza Responses in Older People Using a Brief Bout of Exercise

April Pascoe
University of Sydney

Aim: To determine whether a single short bout of low intensity resistance exercise immediately prior to the administration of the 2012 Influenza Vaccine will improve immune response to the vaccine in the elderly population.

Background: Annual vaccination is the current public health strategy in Australia for the management of Influenza. However, reduced efficacy rates of annual influenza vaccination in the elderly (17-53%) compared with healthy adults (70-90%) poses as a major challenge to public health. Accordingly, this has spurred further investigation into potential adjuvants that can decrease the high rates of vaccine failure in immunological compromised populations, such as the elderly.

In this regard, a short bout of exercise at the time of receiving the vaccination has been shown to enhance the vaccination response within a young adult population. Additional research is required to determine whether acute exercise has a potential use in the clinical setting for future administration of the vaccine.

Methodology: Participants were randomised to complete an exercise task, or alternatively, a resting control task, immediately prior to receiving the vaccine. Further follow up sessions are being conducted at one and six month post vaccination.

Results: Forty six participants (mean age=73±7years, mean BMI=27.2±5kg/m2) were randomized to exercise (N=23, male=11) or control (N=24, male=12) groups. As expected, mean heart rate was significantly greater during task for exercise compared to control group (89.9±12bpm vs.69.8±9bpm). Preliminary results indicate that in the two months following vaccination there were no differences in reported incidence of flu symptoms between groups. Further analyses will determine antibody and cell-mediated responses to vaccine.

Conclusion: Preliminary findings in young adults show that acute exercise can be used to enhance vaccination responses. The current study is an important development to evaluate the use of this behavioral intervention in an at-risk population which currently suffers high rates of vaccine failure."

Government House: An Allegory of the Interplay of Modernism and Tradition Within Australia

Ashleigh Best
University of Technology, Sydney

Government House is a symbol of Australia's colonial origins and a pertinent illustration of the incidental fusion of tradition and modernism. The House serves as a vehicle for examining colonialism as a result of tradition on the one hand, and modernism on the other, dismantling the apparent mutual exclusivity of the two. An analysis of Government House affirms that by engaging in the modernist trend of colonialism, fundamentally based upon imperial interests, British traditions would necessarily be absorbed by the colony. Through an exploration of the physicality of the site, in particular the gothic revival architecture, it becomes apparent that the house is a consequential embodiment of British tradition imported to the colony to serve a function propelled by modernism. Similarly, the adaptation of space within the house, as well as the decoration of it, reflects an inheritance of British customs, whilst marking a celebration of the identity of the newly colonized territory, displayed by the exhibition of portraits of British Monarchs within the house as well as Aboriginal Artwork. Tradition and modernism are further revealed as concurrent forces by the rationale underpinning the construction of the site, being to replace the less decadent First Government House and establish an appropriate environment to centralize and administer a government which naturally resembled that of Britain's. This system was instituted in a land made accessible by virtue of the modernist sentiment of progress associated with colonialism. Government House, a colonial site, therefore emerges as a unique consequence of the dual manifestation of tradition and modernism in Australia.

Structural Evolution of YMnO3

Basilia Sethu
Australian National University

"YMnO3 or yttrium manganate is an ABO3 perovskite-type material and aferroelectric oxide. Ferroelectric oxides are a family of oxide compounds that may exhibit polarisation in the absence of an electric field and are widely used in electronic devices such as computers and mobile phone.

This project aims to investigate the effect of substitution of three different elements in place of manganese (Mn), while exploring how synthesis and physical properties vary with composition. Methods of analysis include X-ray diffraction and structural refinement using software such as Rietica.

The elements being used are aluminium (Al), galium (Ga) and indium (In). While many compounds of the form YMO3 are known (where M= Al, Ga, In, Mn), little work has been done on intermediate compositions.

Compositions of interest in this project have been selected for practicality and are 0.25, 0.5 and 0.75. Compounds of interest then have the following formula: YMn1-xMxO3 where:

x = 0.25, 0.5, 0.75

M = Al, Ga, In

In total, 9 samples were synthesised using measured stoichiometric quantities of the following chemical compounds (all in powdered form): yttrium oxide,manganese acetate tetrahydrate, aluminium nitrate nonahyrate, galium oxide and indium oxide.

Preliminary results suggest that it may be possible to obtain pure phase structures at certain compositions and with certain compounds being more suitable than others."

Bioengineering by oysters: amelioration of desiccation stress on intertidal invertebrates in a warming climate

Dominic Mcafee
Macquarie University

Bioengineers are key determinants of community development and influence the distribution of associated species by altering the availability of resources and ameliorating physical stresses. Ecological theory predicts that the positive influence of bioengineers on biodiversity will increase with the physical stress of the environment. We tested the hypothesis that the difference in communities of intertidal invertebrates between oyster-engineered and oyster-free habitat would be greater in warmer than cooler climates, the difference increasing with desiccation stress. We sampled adjacent habitat patches with and without oysters, on replicate rocky shores and mangrove forests within eight estuaries spanning a 1000 km latitudinal gradient along the NSW coastline. Within each habitat patch we quantified (1) invertebrate community structure and (2) temperature and humidity. We expect that, across all latitudes and on rocky shores and in mangrove forests, oyster-engineered habitat will support a much greater biodiversity and abundance of invertebrates than oyster-free habitat. Moreover, we expect that oyster habitat will provide a cooler and more humid microclimate than bare substrata. We anticipate the magnitude of difference between invertebrate communities to be greater on rocky shores than in mangrove forests due to the greater temperature extremes on rocky shores. Furthermore we expect invertebrate communities to be more similar between habitat with and without oysters in cooler, southerly estuaries, than warmer northerly estuaries. Knowledge of how oyster-invertebrate interactions vary with climatic setting will

assist us in predicting how, in a warming climate, these interactions will modify impacts to biodiversity.

Bon Voyage: An Inquiry into Australian Border Protection and Quarantine

Dominic Smith
University of Technology Sydney

Bon Voyage: An Inquiry into Australian Border Protection and Quarantine provides a case study for a broader investigation into why ideas such as modernity and tradition have affected the nature of quarantine adopted by the Australian health and immigration systems. The essay suggests the concept of quarantine is shaped by a pursuit for progress and argues that throughout Australian history, health and immigration institutions have been driven by ideas derived from reactions to modernity. These are the ideas celebrated in world awareness days and practised in everyday life in areas such as sanitation, hygiene and disease prevention. The essay has four key sections, which cover ideas that are embraced by the institutions throughout quarantine history: Progress, Nationalism, Class Discrimination and Social Darwinism. The analysis of data from photographs, academic books and journals, using methods from the fields of sociology and history lead to the conclusion that the Australian system of health and immigration is based on reactions to enlightenment and pre-existing social traditions. The notion of maintaining the health and security of the human population is an idea devised from both the practices of the past and the ideals related to 'self-improvement' and the 'eradication' of hindrances to the development of society that are central to modernity.

The Factors Influencing Attachment Anxiety and Forgiveness: Angry Rumination, Depressive Rumination and Emotional Reactivity

Elijah Ward
Macquarie University

"Background: Forgiveness is defined as a motivational transformation whereby one inhibits and replaces the negative cognitions, emotions and behaviours towards a transgressor with prosocial motivations. Forgiveness is suggested to have two components, a trait component, concerning the disposition to forgive over time and across situations, and a state component, which concerns forgiveness towards specific offenders in specific situations. Attachment anxiety, which is concerned with a fear of rejection and being overly dependent on others, has been found to have inverse relationships with both trait and state forgiveness. Research suggests that this relationship may be mediated by emotional reactivity, depressive rumination and angry rumination, since various negative emotions and thoughts need to be overcome in order to forgive.

Aims: This study aimed to extend past research by investigating the possible cognitive and emotional mechanisms underlying the relationship between attachment anxiety and forgiveness. It was hypothesized that the results would be consistent with complete mediation of the relationships between attachment anxiety and both state and trait forgiveness by angry rumination, depressive rumination and emotional reactivity.

Methods: This study recruited 101 first-year psychology participants and 105 participants from the social-networking site, Facebook. Participants completed an anonymous online survey comprising of demographic questions, and a battery of pre-established scales presented to participants in a random order.

Results: Hypotheses were partially supported, as regression analyses revealed that although angry rumination and depressive rumination acted as mediators of the association between attachment anxiety and trait forgiveness, no relationship was found to exist between attachment anxiety and state forgiveness, after controlling for social desirability. Also mediation analyses demonstrated that the data was not consistent with mediation by emotional reactivity.

Conclusion: This study underlies the importance of considering angry and depressive rumination when examining forgiveness in anxiously attached individuals and the associated implications for attachment and forgiveness therapies.

Photovoltaic Cell Efficiency on Venus

Emily Haag
Australian National University

The efficiency of photovoltaic cells on Venus was the subject of the research project for the Photovoltaics and Power Technologies Branch of the National Aeronautics and Space Administration (NASA)'s Glenn Research Center. The efficiency of photovoltaic cells in relation to the solar spectrum of Venus was calculated and analyzed. Tasks included plotting atmospheric absorption, altitude, and wavelength and finding solar cell response and quantum efficiency. The analyzed photovoltaic cells included multijunction solar cells that consisted of a top cell GaInP2, middle cell GaAs, and bottom cell Ge. The top cell absorbed short wave photons while the bottom cell absorbed infrared light. Current of the multijunction cell was also determined. This value varied with temperature and solar spectrum. The research project analyzed the effect of technology on space mission design. This is very important to the mission of NASA as it contributes to the development of technologies for power and propulsion of future spaceflight. More specifically, this research project promotes and contributes to future missions to Venus, a planet that can unlock vital information about Earth. Venus is most similar to Earth in size and mass; however, Venus is a searing desert, its waterless surface crushed under a thick atmosphere nearly one hundred times the pressure of that of Earth. The noxious clouds that shroud the planet contain droplets of deadly sulfuric acid. The surface temperature is hot enough to melt lead; yet, both Venus and Earth may have had had similar climates shortly after they formed. Further study of Venus will advance the understanding of the role of early planetary evolution, plate tectonics, and atmospheric change on the evolution of terrestrial planets. This study will be made possible by such advances in photovoltaic arrays.

Colette: The renunciation of love – The case of Fred Peloux

Emily Lau
Macquarie University

Through her novels, twentieth century French writer, Sidonie-Gabrielle Colette, showed an extraordinary lucidity into the themes of love and loss. Colette always based her works on a woman's point of view, even when she was describing the male characters. As a result, most existing studies of Colette's works have been conducted through the perspective of her female characters. In particular, there has been a focus on the intelligence and fortitude of women faced with the ageing process and the renunciation of love. However, there is limited analysis of how male characters' weaknesses lead to their renunciation of love.This presentation considers how and why the male protagonist in Colette's works: Chéri and La Fin de Chéri (The Last of Chéri) renounces love. The question will be explored through the case study of a young man, Fred, who has an affair with Léa, a courtesan of autumnal beauty, in Chéri and La Fin de Chéri. The presentation will engage in a stylistic analysis of two scenes from the chosen works: Fred's return to Léa after his marriage to Edmée in

Chéri and the first time that Fred and Léa see each other after the war in La Fin de Chéri. Ultimately, a combination of social and personal factors leads Fred to leave his mistress. In doing so, Fred reveals his difficulties in living according to his time and age. Fred no longer searches for love because he possesses an idealised version of Léa that no woman, including Léa in her old age, can fulfil.

Waste Management in the Torres Straits: A Systems Approach to Warraber Island

Erin Hughes
University of Queensland

The inhabited islands of the Torres Straits are facing serious issues in relation to waste management due to the limited available space and environmental issues surrounding current waste management methods. The aim of this research was to create a numerical model which can represent waste stream quantities and composition over time on island communities in the Torres Strait. The results can assist in the decision making around waste management strategies for the Torres Strait Island Regional Council (TSIRC). The model, created in STELLA, was based on Warraber Island which is the sole host of a waste pilot plant within the Torres Straits. The data used within the model was obtained from past audits and data collected on site through interviews, audits, surveys and questionnaires. Three scenarios on Warraber; the current waste pilot plant, previous waste practices and alterations to the waste pilot plan; were run within the formulated model. The results indicate that current waste pilot plant remains the best option on Warraber Island as it has only slightly reduced diversion rates since it was installed. However, alterations in regrades to the management of alternative waste streams such as white goods and car bodies and current management issues are recommended to this plant prior to its implementation on other islands under TSIRC. Although the model does not provide a finite solution to the waste management issues it can be used as an effective tool within the decision process for TSIRC.

The Nurses Walk: Colonial Hospitals and Postmodern Realities

Esther Cheung
University of Technology Sydney

Within contemporary Australian society there lies a potent contrast between its modern, colonial foundations and the radical changes of postmodernism. In many ways, this contrast marks the Nurses Walk in the Rocks, the site of Australia's first hospital. As with much of Sydney city, it is historically significant due to its connections with Enlightenment era values of the early nation, imbued with ideas of progress, development and science. Yet, as we move into an era of growing consumerism and cultural symbolism, sites such as the Nurses Walk can be viewed as markedly postmodern, challenging and subverting typified notions of what makes a historical site today. This paper will draw together academic theories and historical events to critically examine these changes in the Nurses Walk, and how they reflect on cultural juxtapositions within Australia.

The effect of voltage on a conductivity gradient in a nanochannel and its application to protein trapping

Helen (Hye Jeong) Jeong
Macquarie University

Studies in the last two decades have demonstrated the use of protein biomarkers for early disease detection. For example, the protein Ki-67 has been used to screen for cervical cancer; while other

biomarkers have assisted the early diagnosis of sicknesses such as kidney and Alzheimer's diseases. Increasingly, these biomarkers have been found at very low concentrations with a high background of abundant proteins. Recent work in nanofluidics has allowed for the possibility of high concentration enhancement and separation – two processes that are essential for the detection and discovery of trace biomarkers. With recent demonstrations of the trapping and detection of these biomolecules using nanochannels, there is a need to better model and appreciate the physical mechanisms that are involved in the trapping of these biomolecules. This paper investigates the effect that voltage has on a conductivity gradient established within a nanochannel. This conductivity gradient is used to focus proteins by balancing the opposing electrophoretic and viscous drag forces. It is established in a nanochannel that connects two microchannels containing solutions, of different salt concentrations and, hence, conductivities. A conductivity gradient is directly observed using a fluorescent salt. Then, the trapping behaviour of a fluorescent protein, R-phycoerythrin, in a phosphate buffered solution containing salt, is investigated by varying the applied voltage. This study concludes that voltage appears to have a significant effect on the conductivity gradient inside a nanochannel, and that this effect may have important implications for protein trapping inside a nanochannel.

Proteomics and interactomics of uPAR-associated lipid raft microdomains in colorectal cancer

Ilze Simpson
Macquarie University

Colorectal cancer (CRC) accounts for 13.1% of all cancer-related deaths in Australia. Furthermore, patient survival significantly decreases in metastasis and late stage cancer, highlighting the importance of developing methods for early detection and treatment of CRC. This requires an understanding of the biological basis of cancer progression. The urokinase plasminogen activator receptor (uPAR) is a GPI-anchored protein that is implicated in cell adhesion, proliferation and migration – characteristics associated with metastatic cancers. Elevated expression of this protein is associated with poor prognosis in CRC and suppressing uPAR expression has been shown to prevent metastasis in mouse models. In addition to this, uPAR is known to partition into lipid rafts – 10-200 nm cholesterol-rich microdomains of the plasma membrane – that have also been implicated in a range of disease states, including cancer progression. Previous studies indicate that uPAR interacts with different proteins when localised to lipid rafts compared to non-raft plasma membranes. This project seeks to identify lipid raft proteins and investigate the differences in uPAR interactions between a highly metastatic CRC cell line, HCT116, and a HCT116 subclone with decreased (approximately 30%) uPAR expression (HCT116 AS uPAR). Sucrose gradient ultracentrifugation was utilised to isolate lipid rafts from these cells, with preliminary results indicating that mature uPAR (a heavily glycosylated form of the protein) partitions predominantly into lipid rafts in HCT116 cells. High accuracy mass spectrometry (ABSCIEX TripleTOF™ 5600) was performed on these raft fractions to identify and compare the proteome and uPAR-interactomic profiles in these cells. In addition, confocal microscopy was performed to determine whether co-localisation of uPAR with its binding partners and known lipid raft proteins occurred predominantly in lipid rafts or in non-raft plasma membranes.

Skeletons in the Closet: Embracing our colonial identity

Imogen Bailey
University of Technology, Sydney

Through 190 years of occupancy, the continual progress and evolution of Hyde Park Barrack's functions reflect ideas of modernity, and later, of postmodernity, acting as a microcosm of the

history of Sydney and a shared convict identity. This paper aims to chronologically trace the influence of modernity, hypermodernity and postmodernity until the present moment, through investigation into a site or space within Sydney. In analysing the development of the 'stain' of convict ancestry from postcolonial times and its recent senescence, the forging of a shared national identity exhibits the continual influence of these movements in shaping our collective social histories. First-hand visits to the site provided the basis of research, followed by investigation into its changing uses and the developing historical scholarship surrounding Australia's engagement with its convict past. The paper determines the site's current status as a World Heritage Site and the resurgence of interest in convict identity to be evident of the developments of modernity and postmodernity and the way these movements continue to shape the face of the Australian identity.

A New Optical Device for Plasma Diagnostics

Jack Muir
The Australian National University

The simultaeneous problem of expanding humanity's access to cheap, reliable energy whilst reducing our reliance on unsustainable fossil fuels is one of the key problems of the 21st century. Nuclear fusion of plasma, the same process that fuels the Sun, has long been heralded as a breakthrough technology, combining the high reliability and power density of traditional nuclear fission plants with high availability fuels and inherant safety. Unfortunately, progress in fusion technology has been slow, but with the recent groundbreaking at ITER (the pre-commercial demonstration reactor) widespread usage is now in sight. Before this goal can be reached, many problems in the dynamics of plasmas must be solved. Plasma physics is notoriously difficult, combining the physics of electrodynamics and fluid mechanics with the mathematical theories of chaos. In a field with such a rich variety of phenomena, accurate and comprehensive experimental measurements are essential to compliment the extensive computer modelling required. In our project, we developed a benchtop prototype of a new interferometer/polarimeter to measure properties of plasmas in the h3-NF reactor at the Australian National University and the HIT-SI reactor at the University of Washington. This device measures the magnetic field and density averages along a line in a plasma by measuring the effect of the plasma on a beam of microwave light. In order to reconstruct a 3D image of these properties, many lines must be sampled. Our device uses only one microwave source and no moving parts, making it far easier to install and calibrate across multiple lines. Our preliminary measurements indicate that the benchtop system performs well.

Jet Launching during Common Envelope Interactions, and the Shapes of Planetary Nebulae

James Tocknell
Macquarie University

Planetary nebulae are some of the most beautiful phenomena in space. Examples include the Cat's Eye Nebula, the Helix Nebula or the Hourglass Nebula. How these objects obtain their shapes is one of the unresolved questions in astronomy and one that taps into the broader unsolved problem of stellar mass-loss. The best model for the formation of planetary nebulae is the interacting stellar winds model, where the gas is ejected from the atmosphere of a dying star interacts with material ejected earlier. Whilst this model can explain spherical planetary nebulae, it fails to explain the more irregularly shaped ones, such as those with lobes and jets. Hence astronomers are searching for other mechanisms which could explain complex planetary nebula shapes. One of the strongest contenders for the shaping of the more complex planetary nebulae are binary systems and indeed close binaries are found in the middle of one in five planetary nebulae. These binaries are so close

that the companion must have been inside the primary in the recent past, an interaction known as a common envelope. Often the nebulae around such binaries have jets which are not accounted for in models of the common envelope interaction. This research, done over the summer of 2012, for the first time considers jets in the context of common envelopes and determines analytically the conditions under which they formed. To do so we have calculated the amount of linear momentum in the jets of 4 planetary nebulae and determined their mass-loss rates. From these quantities we have determined the amount of accretion needed to power the jets and from that we have determined when the accretion had to take place within the common envelope interaction. Finally, we have started to determine the magnetic field strength needed. We concluded that an accretion disk formed during Roche lobe overflow was the most probable cause of the jets in the systems examined. Future observations of jets in planetary nebulae will provide a tool to determine the parameters of the interaction and the circumstances under which the shapes of the nebulae were formed.

Building community capacity at the end of life: an Honours study of health promoting palliative care in the Australian Capital Territory

Jason Mills
Australian Catholic University

Background: Death is not simply a medical event to be governed by health care professionals; nor is dying a solely clinical experience to be sanitised. Death is a social and deeply personal life event—and dying is a communal experience with involvement of, and impact upon, the non-professional community. End of life considerations represent a major public health issue for all members of society, regardless of age or professional discipline. However, the medicalisation of death by health care institutions has served to limit the capacity of communities to participate more meaningfully in the care of their dying. It is imperative therefore, to ensure that the broader community possess the necessary knowledge and skills to effectively address issues of death and dying, and bereavement that inevitably arise in society. The integration of health promotion in palliative care provides a model of care that embraces community ownership of death and dying, grief and bereavement. However, evidence of the use of health promotion in building community capacity to address issues at the end of life is limited. There is some early evidence that suggests health promoting palliative care is gaining momentum in the Australian setting; however its uptake and utility in the Australian context has not been formally examined or evaluated.

Study Aims and Research Question: The aims of this study are to identify and examine community-based activities focused on the building of community capacity regarding issues of death, dying, and end of life care. The study addresses the question: 'What processes assist communities to build capacity to demonstrate healthy attitudes and practices regarding issues of death, dying and end of life care?'

Methods: Participants were recruited via purposive sampling. Qualitative data were collected through semi-structured in-depth interviews, and thematic analysis undertaken.

Results: Preliminary findings and conclusions will be discussed in this presentation.

Lesbian mermaids? The Vagina Monologues runs aground

Jessica Durham
Monash University

This research forms part of my Honours thesis in English and Comparative Literature. My methodology involves combining textual analysis and stylistics, which is the study of how linguistic devices work in literature, with constructivist gender theory, in an analysis of Eve Ensler's The Vagina Monologues. The larger questions of my research look at how gender and language influence each other. Constructivist gender theory applied to the study of literature argues that if gender and sexuality are socially constructed, not biological phenomena (Butler 1993), then a culture's texts literally re-write the lived possibilities of gender and sexuality in the world. So. Lesbian mermaids? Adrienne Rich wrote in 1980 that feminism needs to include lesbians, for feminism's sake and for lesbians'. But has it happened? Or do they remain the sirens tempting feminist vessels into waters they cannot traverse? And how can we test the progress feminism has made? If we look at The Vagina Monologues, an incredibly successful, influential feminist text that claims to empower women, it becomes apparent that the lesbian is the figure on which this text runs aground. The most sexually explicit, lesbian Vagina Monologue is not performed. It is not included in the official script, from which performers worldwide are not permitted to deviate. It has no name. It is one of only two monologues entirely in quotes: it is a voice in which the narrator cannot speak. My questions are: how is language representing lesbian sexuality in this monologue? Its poor narrator is riddled with anxiety. Why so anxious? What is at stake in this representation? What is it about representing lesbian sexuality that creates this incredible tension? And how might this tension be resolved?

Red or Black: Dual Social Theory At Play in the Casino

Johanna Deutsch
University of Technology Sydney

Modernism and postmodernism have long been held at opposite corners of the (socio-theoretical) ring. Notions such that postmodernism 'knocked-out' modernism when the latter appeared to have lost favour with the crowd are enduring. This investigation offers an alternate view that the two concepts are in fact coexistent in society. I contend that our own human experience is directed by the interplay of multiple social theories (and the conditions borne from them) and that, from a broader outlook, society is moulded by postmodernism and modernism simultaneously. I used an empirical method of research to apply this thesis to the example of Sydney's Star Casino and the practice of gambling. I deduce that gambling practices are successfully popularised by the deliberate entwine of both social theories. In less depth, I extend this principle to other social activities such as reality television and the relationship between State and citizen. I conclude by reflecting that my thesis is perhaps less radical than initially thought, for the dynamic character of contemporary society surely justifies the argument that it is founded upon just one social theory.

Scapular dyskinesia: Its relation to shoulder pain in overhead throwing athletes - a systematic review

John Infante
Macquarie University

Shoulder pain affects approximately 1% of adults consulting a general practitioner. The scapular plays an important role in stability with the rotator cuff muscles in the shoulder complex. This makes the scapular a major contributor to shoulder pain. The review looks at the epidemiology of the scapular in shoulder dysfunction using the literature available on overhead throwing athletes in sports such as swimming and baseball. The review concludes with noting that increasing scapula stability through prescribed exercises should be widely recommended to overhead throwing athletes as part of their training regime.

Introduction: The scapula is part of the shoulder complex that functions in a coordinated manner. This synchronised work, which involves movement of the clavicle, humerus and scapula changes the precise movement of the arm (1). The positioning of the scapula and its small movement in relation to the humerus makes it essential for optimal function of the shoulder (3).

Method: Research: Strategy using MeSH terms in five electronic databases. Keywords were used in both subject and title and a combination of both.

Keywords used were: chiropractic, manipulative therapy, shoulder pain, shoulder dysfunction, shoulder instability, shoulder joint, scapula dyskinesia, treatment and rehabilitation exercises.

Selection criterion: Restricted to show only case controlled cohort studies and RCTs including only original research and peer reviewed articles. The perspective observation included: population of humans of any gender; articles relating to scapular dyskinesia; limitation to English publications; publication date post 1990; an exclusion of replicated data. A perspective observation was used along with the PEDro scale to assess the quality of the article and its relevance to our research. Sixteen articles were selected for this review.

Results: The Epidemiology of the scapular in athletes .Instability of the glenohumeral joint can occur during repetitive movements particularly in overhead throwing athletes (4). The scapula provides a stable base for the glenohumeral articulation which reduces the stress of the shoulder capsule (5). Other abnormalities in the scapula kinematics such as scapular winging is also recognised as a contributing factor when evaluating patients with shoulder pain (4, 6). In addition, scapula dyskinesia can also occur due to muscular imbalance, and faulty motor patterns (10). Evidence suggests that scapular dysfunction has an association with glenohumeral internal rotation deficits and increased external rotation (7-9). Studies suggest that this may be due to the hypertrophy of the posterior capsule and stretching of the anterior capsule.(7). Other studies believe it is through a direct cause of humeral retroversion (9). Comparative studies that tested painful and pain-free swimmers suggested that no significant differences were found between overhead thrower's and swimmers (8). However, the clinical findings and associated dysfunctions are quite different and patients should be treated and evaluated differently (8).

Management approaches of scapular dyskinesia: In rehabilitating scapula dyskinesia, this review found that the process should include scapular stability exercises that aim to bring stability back into the scapula. Closed-chain exercises, and open chain-exercises should be included (5). The scapular assistant and retraction test are critical outcome tests that can be used to show if pain can be relieved and movement improved (9). Stark et al 2007, suggests the use of the General Physical Rehabilitation Pyramid as part of the rehabilitation process (10).

Conclusions: Shoulder pain due to scapula dyskinesia is publicised as being all too common in particular within overhead throwing athletes (8). More advancements of basic science research in the anatomy and biomechanics will lead to more specific, non-generalised management approaches. The review of the literature has shown that Scapula dyskinesia is present in most cases and we can conclude that less upward rotation and elevation of scapula was noted in all cases reported in this review (6). Many studies suggest that in treating shoulder dysfunction, a conservative non-operative approach should be applied first (5). The results of this research suggests there is enough evidence towards proper management approaches in the rehabilitation of scapular dyskinesia, including the use of Chiropractic techniques and modalities.

Root-Architecture-Regulator peptide activity: structure-activity studies of MtRAR1 peptide and variants

John Rivers
Australian National University

The symbiosis between nitrogen-fixing rhizobia and legumes is of great agricultural importance. Intra and inter-organism signalling pathways essential for induction and maintenance of this symbiosis have been identified, with evidence suggesting many elements of the symbiotic induction pathway are also involved in non-symbiosis-specific root development. These elements may have been recruited during evolution of the rhizobium-legume symbiosis. A 15-amino acid peptide hormone family, the Root-Architecture-Regulator (RAR) family, has been found to contribute to root-nodule formation, essential for rhizobium-legume symbiosis. Manual application of peptides derived from the Medicago truncatula RAR gene MtRAR1 was found to inhibit lateral root formation, increase nodule formation and induce formation of periodic gall structures. Herein, we report on structural determinants essential for biological activity of the model RAR peptide D1A, derived from MtRAR1. Variants of D1A, with key alterations in amino-acid sequence, were analysed for secondary structure via ultra-violet circular dichroism (CD). By measuring the differential absorption of left versus right-handed helically-polarised light, CD provides characteristic spectra for peptide secondary structures. Comparisons of resulting spectra were made to existing literature, with additional structural estimation undertaken with CD linear regression algorithms LINCOMB and MLR. Structural estimates were reconciled with previously-obtained bio-activity data for D1A. We speculate D1A possesses a β-turn amino-acid motif, facilitating a β-hairpin secondary structure. Structural stabilisation requires π-stacking interaction between residues 2 (phenylalanine) and 15 (histidine), reflected in the random coil CD spectrum obtained for the D1A variant lacking His-15. Native structure also requires hydroxylation of proline residues 4 and 11. Mono-hydroxylation resulted in weakening of the β-hairpin. Complete removal of proline hydroxylation however, resulted in a more-stable β-hairpin structure. Decreased biological activity has been previously observed for all peptides we have demonstrated to have non-native structure, suggesting a fine interplay exists between β-hairpin formation and receptor-binding capacity.

Radiation dose to the thyroid gland from supraclavicular fossa irradiation in breast cancer patients

Juan Phoon Carinne Ho
The University of Sydney

Background: Women receiving tangential breast Radiation Therapy (RT) for node positive breast cancer may require the irradiation of peripheral lymph nodes using a Supra-Clavicular Fossa (SCF) field. The anatomical region encompassing the SCF can be in close proximity to the thyroid gland, possibly increasing the amount of radiation dose it receives. The thyroid gland is a highly radiosensitive organ and is vital for producing several hormones that are necessary for metabolic regulation. While SCF field placement is standardized, previous research suggests that thyroid gland size and anatomical position varies and that the thyroid may be within the SCF field for some women. Currently, the thyroid is not considered an Organ At Risk (OAR) in breast cancer RT planning guidelines. As such, the amount of radiation dose the thyroid gland receives is not routinely quantified, but it is hypothesized to be unacceptable in some patients. The aim of this research is to measure the radiation dose to the thyroid gland from SCF field in RT treatment plans of patients previously managed for breast cancer.

Methods: This was a retrospective study involving Computed Tomography (CT)-based analysis of RT treatment plans of women (n = 30) treated for non-metastatic breast cancer at Royal North Shore Hospital between February 2009 and March 2012. The thyroid gland was outlined on the CT slices. Inter- and intra-observer reliability of thyroid gland contouring was determined using Intra-Class Correlation coefficients on a subset of data (n=10) and was found to be 0.99 and 1.00 respectively.

Thyroid gland volume (cm3) and radiation dose to the thyroid were measured using dose-volume parameters generated by the RT treatment planning system software and were analysed using descriptive statistics.

Conclusions : Preliminary results confirm previous studies that suggest thyroid gland size and position to be highly variable among individuals. In addition, a significant number of patients who underwent SCF irradiation as part of breast cancer RT received a substantial amount of radiation dose to the thyroid gland. Based on these preliminary findings, a recommendation is made for routine thyroid gland contouring for SCF RT patients in order to avoid unnecessary dose to the thyroid. Data analysis is continuing on the remaining data.

Antibiotic resistance in Mycoplasma genitalium

Kaitlin Tagg
Macquarie University

Mycoplasma genitalium is a significant sexually transmitted bacterial pathogen, causing up to 25% of cases of non-gonococcal urethritis in men and strongly associated with both cervicitis and pelvic inflammatory disease in women. It is most often treated with azithromycin, although identification of treatment failure in 12-33% of cases suggests a high level of resistance to azithromycin. The mutations responsible for this resistance are found in the 23S rRNA gene of M. genitalium. The second-line antibiotic, moxifloxacin, is used when azithromycin treatment fails. However, recent studies have identified mutations in the parC and gyrA genes that may confer potential resistance to moxifloxacin. This study aims to identify the incidence of resistance to these antibiotics in M. genitalium strains in Sydney by detection of resistance-inducing mutations in the 23S rRNA gene, the parC gene and the gyrA gene. M. genitalium positive DNA extracts collected from patients attending sexual health clinics in Sydney from 2008-2012 were available for use in this study. Through PCR amplification and DNA sequence alignment analyses we have identified known resistance-associated mutations in the 23S rRNA gene in 50% of samples (n=184). This suggests that resistance to first line antibiotics will occur in approximately half of patients receiving treatment. Further analyses of the parC gene sequences have revealed mutations in 13% of samples, suggesting potential resistance to the only second line antibiotic in use. With this knowledge of incidence of resistance in Sydney, testing and treatment protocols for M. genitalium infections may need revising.

Exploring the Role of Cytochrome P450s in Pollutant Degradation and Resistance

Katelyn Richards
The University of Queensland

Bioremediation—the use of biological systems to detoxify pollutants released to the natural environment—is an increasingly common approach to modern environmental problems and as such, the overarching aim of this project was to explore the application of enzymes to the clean-up of persistent pesticides, by examining their ability to bind these compounds of interest. The enzymes of focus here belong to a class of biocatalysts known as cytochrome P450s, known for their involvement in the break down of drugs and pollutants. Two P450 enzymes were explored in the present study, CYP6A23 and CYP6G3. CYP6A23 has previously been located in the drug metabolising tissues of the fruitfly and is associated with DDT resistance. Similarly, CYP6G3, from the blowfly, is a homologue of a P450 known to confer DDT resistance. These enzymes were expressed in E.coli membranes and tested with nine different compounds using difference spectroscopy in the visible spectrum. From the absorbance spectra, the type of binding and the binding parameters were determined. The pesticides (carbaryl, malathion, chlorfenvinphos, DDT, endosulfan, and lufenuron)

and the common P450 ligand, lauric acid, all had results suggesting they were potential substrates of CYP6A23. By contrast, ketoconazole and testosterone, two other common P450 ligands, showed a spectrum indicative of inhibitory interactions on CYP6A23. Chlorfenvinphos, endosulfan and malathion were all identified as possible substrates of CYP6G3. These results suggest that CYP6A23 and CYP6G3 could be used as a means of degrading pollutants, such as those pesticides tested, in the environment and also further suggest their involvement in pathways of insect pesticide resistance. Future studies will be needed to confirm whether the pesticides are indeed broken down by these enzymes.

Flavonoid intake: developing a food frequency questionnaire

Keren Papier
Griffith University

Background: Flavonoids are associated with health benefits, which include reduction in the risk of mortality from cardiovascular disease and cancer. Flavonoids are present in fruits, vegetables, chocolate, wine, tea and coffee. Having a valid Flavonoid food frequency questionnaire (FFQ) will enable for the efficient and inexpensive assessment of a populations' flavonoid intakes, which may help to assess risk of chronic diseases.

Objective: To assess the validity of a FFQ designed for assessing Flavonoid intake relative to weighed food records (WFR) of 60 Griffith University undergraduate students.

Methods : 60 participants completed 7-day WFR and two FFQs taken three months apart. Three consecutive days were taken from the WFRs. Flavonoid intakes were calculated separately for the FFQs and WFRs using Foodworks Xyris, Excel, SPSS, MedCalc and the 2011 USDA Flavonoid database. Intakes from the WFRs and FFQs were computed, tested for normality and compared. Validity was assessed using quartiles classification, Spearman's correlation analysis and a Bland and Altman plot for the FFQ1 and WFRs. Repeatability of the FFQ was assessed using Spearman's correlation analysis for the FFQ1 and FFQ2.

Results : 25 repeating Flavonoids emerged from the WFRs and the FFQ1. Many of these flavonoids were consumed through green and black tea, onions and grapes. FFQ means were consistently higher than WFR means. Quartiles classification classified over half of all participants into the same or adjacent quartile for all 25 flavonoids. Correlations for the FFQ1 and WFRs ranged between 0.40 and 0.70 for 17/25 flavonoids. The Bland and Altman plot showed agreement between FFQ1 and WFRs for 23/25 flavonoids. Correlations for the FFQ1 and FFQ2 were significant for all 62 foods.

Conclusion: Future studies should conduct multiple WFRs to account for seasonal food changes, which would likely explain lower WFR means. This study suggests that this FFQ is a valid tool for assessing Flavonoid intake based on the high agreement between the FFQ1 and WFR, the ability to rank most participants into the same or adjacent quartiles for all Flavonoids and the FFQ's high repeatability.

School and Play – A Brighter Learning Way for Queensland's Children

Kevin Bell
Griffith University

Field of investigation: In this submission, the importance of continuing play as a fundamental necessity to the mental health and continued learning in the early years after the completion of pre-

school is presented. The Early Years is nationally recognised as birth to 8 years of age, however, since the introduction of Naplan testing in Australia and the addition of the preparatory year in Queensland schools, the expectations of improved test scores and accountability has pressured teachers to adopt a more formalised, subject-oriented approach in kindergarten and prep classroom.

Methodology: Desktop research was conducted on the effects of lack of play opportunities to the mental health of children and adolescents and found the decline in play is having significant negative impacts across all domains of children's development. Furthermore, discussion took place with several academics in the field of education.

Background: The background to this project begins with a particular interest in this field as a single parent with 2 young boys; and also as a worker in the fields of After School Care and Residential Care who witnesses children on a daily basis with behavioural issues, low problem solving skills, and poor resilience. Additionally, current studies for an undergraduate degree and continuing research work for Dr Jennifer Cartmel has ignited my passion for play to be reintroduced to contemporary children in an ever changing world.

Summary: The research and discussions together, posit that the introduction of outdoor unstructured play in the school grounds will have significant benefits to children's development up to and inclusive of 8 years of age, or grade 2. The benefits of play are examined in detail and clearly indicate that play is fundamental to children's brain development and can facilitate improved literacy and numeracy outcomes when included as part of the learning environment.

Sex-dependent effects of maternal overnutrition on offspring metabolic development

Krystle Fredericks
The University of Sydney

Sex-dependent effects of maternal overnutrition on offspring metabolic development of interest to my honours project are the developmental origins of type 2 diabetes. Specifically, why is it that female offspring are protected against impaired glucose tolerance that develops in their brothers exposed to the identical intrauterine environment? This project was informed from two integral articles that challenge the homogeneity of developmental origins of adult disease. Specifically, these studies observed developmental impaired glucose tolerance in male but not female offspring of obese mothers consuming a high carbohydrate diet. We sort to investigate if this sex dependent developmental impaired glucose tolerance was true in offspring of non-obese mothers consuming a high fat diet.

Study Design: We analysed glucose tolerance as well as liver and skeletal muscle fuel storage (glycogen and triglyceride content) of 79 offspring originating from either control fed or high fat fed rats. Samples for 42 male and 37 female animals were harvested at 3 months of age. All offspring consumed chow diet during post-natal development ensuring exposure to high fat feeding was restricted to the in utero period only.

Preliminary results and conclusions: Glucose tolerance was significantly impaired ($p<0.0001$), only in male offspring of high fat fed mothers. Liver triglyceride content was similar between offspring groups for both sexes. Liver glycogen content was similar between offspring groups for both sexes. Skeletal muscle is currently under investigation. Impaired glucose tolerance displayed a direct, significant ($p = 0.02$) relationship with higher liver fat content in males only. We have observed a sex-dependent effect of maternal overnutrition on the development of glucose intolerance in

offspring. We are currently investigating liver insulin signalling proteins as well as skeletal muscle fuel storage in aid of identifying potential mechanisms.

Understanding youth participation: Exploring refugee young women's perceptions

Laura McKenna
Australian Catholic University

This research project is an exploratory study investigating the western concept and meaning of youth participation, from the point of view of a refugee young woman. Within youth work practice, research, government strategy and policy in Australia; youth participation has become a widely accepted concept. Referring to the inclusion, decision-making and engagement of young people, youth participation is underpinned by social justice and egalitarian rights. Within this research project, the ideology underpinning youth participation is deconstructed and critiqued to move beyond the conclusive framework it is constrained by. The research project aims to explore the cultural relevance and possible tokenism youth participation has to young refugee women. It examines the role gender and refugee background play in the interpretation and perception of participation. Moreover, interpretations of power, authority and control are investigated throughout the research project. A comprehensive review of current and pertinent literature suggests that there is little research focusing on the understanding of youth participation in relation to refugee young people. This research combines focus groups and semi-structured in depth interviews with refugee young women. The qualitative research explores experiences of youth participation from the perspective of a young refugee woman. Despite the seemingly limitless advantages of youth participation, I propose the intersecting identities of a refugee young woman can prove problematic and tokenistic in participatory practice and, paradoxically, result in exclusion.

He's sexy and he knows it: Using harlequin bugs to investigate the links between the design and presentation of iridescent signals.

Laurie-Anne Keller
Macquarie University

Males of most species are typically faced with the challenge of dazzling females, not only through their physique, but also their 'advertising skills'. The past decade has seen increased interest in the coupling between signal design and display across a range of species (e.g. Hummingbirds, Peacocks). The theory of sensory drive proposes that 'signallers' will directly manipulate qualities of a signal (e.g. colours, physical structures) through behaviours that serve to enhance transmission to exclusive 'receivers'. This theory predicts co-evolutionary links between the design of signals and how they are communicated. I set out to address this prediction using the sexually dichromatic hibiscus harlequin bug (Tectocoris diophthalmus). Males of this species possess highly iridescent patches on their scutellum, which is thought to function as a sexual signal. The angle-dependent nature of this colouration offers an intriguing aspect to signal delivery. I aimed to specifically test the hypothesis of 'design-display co-evolution' by assessing relationships between signal design and its presentation during courtship. I used reflectance spectrometry to characterise iridescent reflectance as seen on the dorsal area of adult males, females and penultimate instar nymphs. Males are known to initiate courting displays frontally to females, so I expected the brightest level of iridescence to occur when males are viewed front on, but not necessarily in females and nymphs. A preliminary repeatability study indicated that iridescent colouration could be accurately and reliably quantified in nymphs and adults. The data further suggest that signal brightness, hue and angularity vary greatly between iridescent regions around the scutellum of individuals. Males appear much brighter from a front-angled perspective, whereas nymphs and adults in general are brighter when viewed

posteriorly. I will discuss these and other aspects of the results in the context of sensory drive theory, and as an explicit test of the signal design-display co-evolution hypothesis.

Equality- Not Such a Queer Idea

Liana Hampson
University of Technology Sydney

The paper investigates the ongoing discrimination faced by the gay community and the underlying causes, linking ideas and concepts that emerged during the time of the Enlightenment to today's world. Central to the protests of discrimination and disadvantage sits the dominant ideology that constructs and reproduces relationships and sexuality as inherently heterosexual. An analysis of the notion of homosexuality reveals how the values of rationalism and the authority of science, two of the prominent ideas which shape modern civilisation, continue to subjugate those identifying as non-heterosexual by reinforcing the dichotomy of straight/ gay through medical discourses. The methodology used for my research included a wide range of reading on the medicalisation of deviance, specifically concerning sexual behaviour, and research on domestic and international legal changes concerning the gay community. Remaining informed on the current equal marriage campaign in Australia through constant access to social media and the internet assisted in the development of my understanding of the current discourses surrounding non-heterosexual identities which lead me to discuss the continued reproduction of the straight/ gay binary. The paper was compiled for an assessment in the subject Ideas in History and was to be a critical analysis of how the ideas of modernity and postmodernity had influenced a site in Sydney, and more broadly, the present moment in which we live.

Compressive strength of alkali-activated geopolymer mortars using fly ash and ground granulated blast-furnace slag

Lindsay Grogan
RMIT University

This paper looks in to the complete replacement of ordinary Portland cement with geopolymers - synthetic aluminosilicate materials – as the cementitious binding material in concrete. It investigates the mixing of two supplementary cement materials (SCM) – pulverised fly ash (PFA) and ground granulated blast-furnace slag (GGBS) – to determine the mechanical strength of specimens through compressive stress testing. Previous studies have investigated the behaviour of geopolymer concrete while changing such variables as water-to-geopolymer solids ratio; alkali activator concentration; alkali modulus; curing temperature; among others - but relatively few papers have studied the behaviour of PFA/GGBS blends. This research is intended to enhance the understanding of the behaviour of these blends and to build on the emerging collection of literature on the topic. It is anticipated that smaller increments in mix ratio will yield a more comprehensive knowledge of optimum mix designs. In 2010, cement demand was 3.3B tonnes worldwide and rising – the environmental impetus to produce a cleaner alternative to OPC is clear and already well established in the literature. An alternative may lie in geopolymer concretes, as they produce approximately 5-6 times less CO2 than standard OPC mortars. Concrete specimen cubes (50mm sides) were produced with a mix of PFA, GGBS, fine-grained sand, water and alkali activators (Na2SiO3 and NaOH). The PFA/GGBS ratio was varied over 4 initial tests: 100% PFA (Control); 95/5%; 90/10%; and 85%/15% respectively. The amount of water, sand and alkali activators remained constant for all tests. Compressive strength was tested at 3, 7, 14 & 28 days. Initial tests indicate an increase in compressive strength as more GGBS is added. Some specimens exceed 28 day strengths of 50 MPa, making the mechanical strength comparable to that of regular concrete.

Cognitive Load Measurement through Muscle Actions

Ling Luo
The University of Sydney

Categories: Human Computer Interaction. Cognitive load represents the mental effort imposed on a subject's cognitive system when performing a task. It is related to the working memory, which refers to the brain system providing temporary storage and manipulation of the information necessary to complete tasks. However, working memory is limited, and when the load exceeds capacity, the subject's performance tends to degrade. The degradation could lead to longer reaction time, higher error rate, and sometimes even cause serious consequences. Moreover, in an educational context, getting information on the students' cognitive state could help teachers better control their teaching material and pace. Therefore, research into ways to estimate human cognitive state and capability is critical in improving the development of optimised human decision support. The project explores whether muscular actions correlate with cognitive demand, and whether quantifying these actions could be used as a real-time indicator of the cognitive state. A user experiment was conducted, involving 12 subjects who were asked to perform two simultaneous tasks (dual task design). The main task was a pressure control task, which instructed the subject to press a digital tablet's screen using a stylus while maintaining the pressure within a predefined range. The other was to count random numbers of tones played in the background. The pressure values and performance of each task were analysed using descriptive statistics, including t-test, ANOVA and Friedman's ANOVA tests. The results indicate that variations in fine pressure control exerted by hand are a potential real-time indicator of cognitive load. More specifically, the average pressure and error rate are sensitive to the fluctuation of cognitive load. Under higher cognitive load, participants pressed harder than usual, and exceeded the imposed upper pressure bound significantly more often.

Infection Control in the Pre Hospital Setting

Lydia Muller
Central Queensland University

Background: A comparison of the cleaning structures of the UK ambulance services and that of Australian ambulance services shows that there are many innovations from the UK that are yet to be implemented in Australia. One such strategy is the use of educated and qualified cleaning crews (NHS, 2006), dedicated purely to the disinfection and sterilisation of ambulances and emergency vehicles. The lack of such crews in Australia is critically reviewed in this research paper. A U.S.A. study found that 1.7 million hospital-acquired infections (HAI) cause, or contribute to 99,000 deaths each year (Klevens et. al., 2007). Of these deaths an estimated 36,000 were caused by pneumonia, 31,000 resulted from blood infections, 13,000 were urinary tract infections, an estimated 8,000 resulted from surgical site infections and, "other sites of infection" accounted for approximately 11,000 cases. Klevens et. al. (2006), concluded that in the U.S. HAIs in hospitals substantially increase the risks of morbidity and mortality. HAIs are defined as diseases or infections that were not present at the time of admission into the hospital (WHO, 2002). Research Question: Infection control strategies are in place within the Queensland Ambulance Services (QAS) (QAS, 2000), in Australia. This study questions whether the strategies are sufficient, and if they are being implemented in accordance with national and international standards

Methodology: This is done via the research of, and subsequent amalgamation of information obtained from a series of documents, journals, interviews, internet searches and analyses appropriate to the research topic. . An initial review of journals and documents from internet sources such as NHSN annual reports, Northern Health Annual Report, and Ambulance Guidelines:

Reducing infection through effective practice in the pre-hospital setting, was conducted, investigating specific instances of HAI's in QAS that may have been reported. This initial study revealed that several instances of HAI's have occurred over the last five years and more, indicating that further study into these incidents is justified. Interviews conducted with the London Ambulance Service Personal via email, and interviews conducted with Ambulance Services within America during a scheduled student clinical placement provided an in depth accurate account of the manner in which equipment cleanliness was maintained providing means for comparison to QAS methods and standards.

Preliminary Conclusion: It was found that although QAS has a high standard of regulations for infection control to uphold, significant improvements could be achieved from further education in the area as well as the implementation of specialised cleaning crews into the service.

Consuming Nationalism: The Evolution of the Australian Retail Industry from Rural Stores to Selling in a Modern World

Madeleine Causbrook
The University of Technology, Sydney

Consuming Nationalism utilises the Sydney Power House Museum installation 'What's in Store? Shopping in Australia 1880-1930' to trace the influence of tradition and modernity on transforming the Australian retail industry over time. The essay commences by exploring the contested notion that the country was settled on enlightenment ideologies to elucidate the complexity of the concept of tradition in a newly federated nation. By considering various items and documents from the exhibition that exemplify British trading customs in colonial Australia, I delineate the inherited essence of practices that yearned to reflect a uniquely Australian way of life. Such introduces a discussion on how modernity radically redefined the economic and cultural function of shopping, and provided a new industry for Australia to proliferate a distinct representation of nationhood. It is therein that the piece attributes Eric Hobsbawn's study on 'invented traditions' to the emergence of an Australian 'bush mythology' in twentieth century advertisements for diverse products as shown in the installation. In doing so, I also expand on Kim Humphrey's assertion that the rise of consumerism after federation exemplified a purely economic expansionist policy by suggesting that another, more intrinsic focus, was on creating an autonomous national identity for a country lacking the cultural stability of its European role models. Images of rurality on Australian commercials from family soup and tea to beer are demystified to having transmitted an imagined impression of the majority of Australians as having historically resided in virtuous, egalitarian outback communities. It is thence that I propose that the bush legend was embraced by a modern nation devoid of traditions, throughout a consumer culture that has persisted to capitalise on the materialistic desires of contemporary society. My methodology accordingly consisted of applying theories of Hobsbawn, Humphrey, Ferdinand Tonnies and Robert Crawford to items and photographs from the Power House Museum collection and the State Library of New South Wales that demonstrated the evolution of Australia's retail culture over time.

Synthesis of metallophthalocyanine complexes

Marshall Nelson
University of Technology, Sydney

Metallophthalocyanine's are a class of chemical compounds that have been the focus of extensive research for a wide range of applications from cancer therapy to solar cell technology. For most of these applications, the optical and redox properties of the complexes are vital to their function. In

the work presented here, two new ruthenium phthalocyanine complexes were synthesized that included ferrocene compounds coordinated to the ruthenium metal centre. Ferrocene compounds are an important class of redox-active compounds and were used in this work to impart a redox functionality to the complexes. Importantly, one of the new compounds also contained a thioacetate group to enable binding of the complex to metallic gold surfaces and particles. The optical properties of the new compounds were measured together with their 1H nuclear magnetic resonance spectra.

"Sign me up!" The effect of multiple group memberships on adjustment to organisational change

Matthew Hull
Macquarie University

The purpose of this research project is to explore individual factors which affect employee adjustment to organisational change. More specifically, the aim is to examine how need for closure (NFC), social identity complexity (SIC), and organisational identification contribute to employee psychological resilience to organisational change. Psychological resilience is one's ability to 'bounce back' from significant adversity, and is particularly important when faced with the stress and uncertainty of workplace change. NFC reflects one's desire for a rapid and secure answer to any question or decision, over and above uncertainty or confusion. Since uncertainty is one of the most frequently reported psychological states during organisational change (Bordia, Hobman, Jones, Gallois, & Callan, 2004) and is negatively related to coping (Kruglanski, Pierro, Higgins, & Capozza, 2007), it is hypothesised that NFC will have a negative relationship with psychological resilience to organisational change. SIC is a relatively emerging theoretical construct that refers to an individual's subjective interpretation of the interrelationships among their multiple group identities. It is predicted that SIC will be positively related to psychological resilience to organisational change, and negatively related to NFC, since high complexity is linked to greater openness to change, open-mindedness, and tolerance of novelty (Roccas & Brewer, 2002). Organisational identification reflects a perception of oneness with the collective organisational entity, and is hypothesised to have a positive relationship with psychological resilience to organisational change, a relationship which is predicted to be moderated by SIC and NFC. Employees from two large Australian organisations  one public sector department and one retail chain  will be responding to a battery of relevant scales in an online survey. It is predicted that the results of the surveys will help organisations to identify areas which may require additional change management resources, and diagnose what could make potential future changes a success.

Biological Changes in the Hippocampus Following Chronic Methamphetamine Use: A Proteomic Approach

Melanie Sauer
Macquarie University

Methamphetamine is a highly addictive drug associated with depression, anxiety and induced psychosis following long-term abuse. Methamphetamine is known to act on dopamine and noradrenaline brain systems with previous studies highlighting protein changes of the prefrontal cortex, striatum and amygdala following repeated methamphetamine administration. The hippocampus, also innervated by dopamine, is becoming increasingly recognised for regulating drug addiction and psychoses, however, a role for the hippocampus in methamphetamine abuse has not been determined. Therefore, this study was designed to assess the biological changes in the hippocampus following chronic methamphetamine use. It was hypothesised that differentially expressed proteins would demonstrate evidence of neuroplasticity, particularly cytoskeletal and synaptic alterations in methamphetamine-treated rats, as well as early signs of neurotoxicity, such

as oxidative stress, compared to controls. Using locomotor sensitization to methamphetamine as an animal model of methamphetamine abuse and psychosis, 16 male Sprague Dawley rats were randomly assigned to either methamphetamine (treatment) or saline (control) groups. Two weeks following 7 days of daily treatment with either methamphetamine or saline, rats were then euthanised and hippocampi were dissected for protein analysis. A label-free shotgun proteomic analysis using mass spectrometry was used to detect differentially expressed proteins indicative of biological changes. Methamphetamine treatment produced significant changes in protein levels of the hippocampus compared to controls. Proteomic analysis yielded low false discovery rates at the protein level (<0.27%) and peptide level (<2.7%). In regards to neuroplasticity, a large number of differentially expressed proteins indicative of cytoskeletal alterations such as vimentin, and indicative of synaptic alterations such as GTPase KRas were found. Regarding neurotoxicity, differentially expressed proteins indicative of oxidative stress such as electron-transferring-flavoprotein dehydrogenase were also found. These biological changes in the hippocampus of methamphetamine-sensitised rats may have significant implications for the reversal of learning and memory deficits, and induced psychosis in chronic methamphetamine users.

Social networking in Port Jackson sharks

Nathan Bass
Macquarie University

Determining the nature of social relationships within groups of sharks is fundamental to understanding their behaviour, ecology and evolution. Many shark species aggregate throughout their lives and very little is known about the formation of these aggregations. Also, these aggregations are often targeted by recreational and commercial fisheries. The removal of sharks not only decreases their own abundance, but can also influence the abundance of species lower down in the food chain. Given that sharks influence entire marine ecosystems, understanding the formation of these aggregations will allow us to better conserve endangered shark populations and marine ecosystems. This multidisciplinary research, combining novel proximity receiver technology, acoustic telemetry and social network theory, will investigate the social dynamics of group formation in Port Jackson sharks and whether demographic factors, such as size and sex, influence this social structure. We also aim to compare visual census techniques and the novel proximity receiver technology in an attempt to optimise future studies concerning social networking in other highly mobile and cryptic species. Port Jackson sharks will be captured, processed (sexed, measured and fin-clipped for genetic analysis) and tagged with VEMCO transmitters (n = 20), proximity receivers (n = 6) and external identification tags. The proximity receivers record interactions between acoustically tagged sharks by logging the time and identity of any acoustically tagged shark within a pre-programmed distance of the receiver. The proximity receivers are programmed to alternate between detection distances of 2 metres and 4 metres every 5 minutes. Underwater surveys, conducted over three week-long periods in July, August and September, will be used to identify and record the behaviour of aggregating Port Jacksons sharks. Acoustic monitoring, using the pre-existing Jervis Bay Marine Park array, will also be used to construct social networks based on the simultaneous detection of sharks by the same receiver.

The effect of Isoprene on Species Distribution: basal isoprene emission from Angophora costata and Eucalyptus haemastoma

Nathan Bell
Macquarie University

Isoprene (2-methly 1,3-butadiene) is the most abundant volatile organic compound emitted by plants, annual emissions exceed that of methane, which has received much attention for greenhouse gas properties. The emission of isoprene has been suggested to be the most important biosphere-atmosphere interaction, but little is known of the reason why plants produce isoprene. Isoprene is costly to plants in ATP, NADPH and carbon loss and there are several hypotheses as to why plants emit isoprene with some conferring benefit to the plant and others suggesting isoprene is simply a by-product. It is suggested that the evolution of some plant species to incorporate isoprene as a protective measure may be seen in the way these species differentially occupy habitats. The Isoprene synthase gene is found in species occupying all vegetation levels from ferns and shrubs to canopy species and even mosses. However, geographically isoprene is produced in highest quantities in equatorial and Mediterranean environments. Australian vegetation communities are well known for their disproportionate contribution to atmospheric isoprene, particularly from Eucalypts and related species. In Sandstone ridge-top vegetation communities in the Sydney basin, Eucalyptus haemastoma and Angophora costata have long been observed to grow on ridge tops and in lower areas of the slope respectively. It is this preference for habitat selection between genera that allows isoprene emission to be tested against the thermoprotection hypothesis. Ridge top species are thought to have developed tolerance to long periods of high temperature exposure, while species inhabiting lower areas are susceptible to short term high-temperature episodes. Variations in the basal rates of isoprene emitted by E. hameastoma and A. costata were measured at the Macquarie University glass house facility in a purpose built chamber. A. costata was found to produce significantly higher levels of isoprene than E. haemastoma, supporting the hypothesis that they produce isoprene as a temperature protection strategy.

In silico resistance gene search in Eucalyptus grandis genome

Peri Tobias
Macquarie University

Plants have evolved multiple layers of defence responses to pathogens. A first line of defence is the recognition and response to common molecular patterns whereas specific responses, somewhat analogous to vertebrate antibody response, are commonly termed resistance proteins (R-proteins). The transcription of resistance genes (R-genes) allows a rapid and effective blocking of pathogen progression and these genes have come to be sought after in the development of resilient crop plants. The recently published genome of Eucalyptus grandis (2011) has provided a valuable resource for the identification of potential resistance genes in this significant Australian genus. In this study a search was conducted against the E. grandis genome for one important class of R-genes that incorporate nucleotide binding sites and leucine-rich repeat protein domains (NB-LRR). Several predicted coding sequences were located and primers were designed to amplify the genes from leaf DNA. The identification of R-genes in E. grandis, and the pathogens that activate them, will provide researchers with a targeted approach to defence response studies in this species. Developing an understanding of R-gene response in Eucalypts is of particular relevance to Australia with the recent arrival of the pathogen causing Myrtle Rust, which has spread rapidly along the east coast since its first identification on the NSW Central Coast in 2010.

The source of environmental lead contamination in Broken Hill, NSW

Peter Mahoney
Macquarie University

Environmental lead contamination and blood-lead poisoning is an ongoing concern in Broken Hill, New South Wales. Screening programs in the early 1990s revealed unsafe levels of blood-lead in

20% of children in Broken Hill. Blood-lead poisoning has been directly linked to adverse neurological and behavioural problems in children. It is claimed that high lead levels in the community are naturally occurring due to a rich, highly localised deposit of lead and silver ores. This study investigated the source of lead contamination in the soils around the town of Broken Hill. Residential areas within the town were established adjacent to mining and smelting operations and were subject to aeolian lead sediments from these sources. Rail transport of ore in uncovered wagons likely further promoted the aeolian entrainment of lead dust. Soil profiles collected within Broken Hill and outside the town along regional rail corridors were analysed for lead concentration and isotopic composition. Surface soils consistently display high levels of lead enrichment in comparison to subsoils, demonstrating a modern timeframe for this contamination. Surface lead levels are greatest proximate to the ore body and to rail lines, diminishing with increasing distance. Lead isotopic composition in soil samples reveals that the lead in surface soils is more strongly correlated with ore extracted by mining activities than with lead naturally occurring in the regional subsoils. These multiple lines of evidence clearly establish an anthropogenic origin for the soil lead contamination in Broken Hill and along rail corridors used in the transport of ore.

The Influence of Father's Challenging Behaviour on Childhood Anxiety Disorders

Rebecca Lazarus
Macquarie University

Research postulates that fathers play an essential role in challenging their children's behavior, encouraging them to take risks and explore unfamiliar situations with confidence (Majdandzic, de Vente, Feinberg, Aktar & Bogels, 2012). Despite this, little is known about the paternal influence on childhood anxiety disorders, particularly with respect to challenging behavior. Using a correlational within-subjects design, this study presents one of the first investigations of the Challenging Parenting Behaviour Questionnaire (CPBQ), developed by Majdandzic, de Vente & Bogels (2010), using preschool aged children and their parents. The CPBQ assesses challenging behaviour through domains such as 'Encouragement of Risk Taking' and 'Rough and Tumble Play'. To compare the results from the CPBQ questionnaire, the Challenging Behaviour Computer Task (CBCT) was designed specifically for this study. The CBCT contains an online computer task aimed at assessing father's challenging behaviour. Child and paternal anxiety were also assessed through diagnostic interviews and online questionnaires. The primary aim of this study was to investigate the bivariate relationship between paternal challenging behaviour and child anxiety. Secondary aims investigated the relationships between paternal anxiety and father's challenging behaviour, as well as between paternal anxiety and child anxiety. It is hypothesised that children whose fathers challenge behaviour less will exhibit higher levels of anxiety compared to those whose fathers challenge behaviour more. Similarly, it is expected that fathers with higher levels of anxiety will challenge behaviour less than fathers with lower levels of anxiety. It is also predicted children with more anxious fathers will exhibit higher levels of anxiety compared to children with less anxious fathers. It is anticipated that this research will provide further contribution to current theory of anxiety development. Potential outcomes include modification of current treatment programs, as including fathers in treatment could provide alternate benefits to the child.

Manga as a Gateway to Further Japanese Education

Rebecka O'Malley
Macquarie University

Manga and anime (Japanese comics and animation) are becoming increasingly popular worldwide as a form of entertainment, and has a certain exotic appeal for Westerners. Many mangaka (manga

authors/illustrators) have come to recognise manga's worldwide appeal and use this to their advantage when creating stories, ensuring that it sells well both domestically and overseas. Manga containing distinctly Japanese situations, such as manga about school life, martial arts, traditional Japanese culture, Japanese historical dramas, or even just stories about everyday life in modern Japan are all appealing within Japan as something familiar, and in the West as something different and exotic. Two examples of this are xxxHolic by CLAMP, and Lucky Star by Kagami Yoshimizu.I argue that manga, especially the ones that contain a great deal of information about Japan, can be used as a gateway into the world of formal Japanese education. Many manga readers in the West have an interest in Japan, its culture, and its language (with some readers enjoying manga purely because it is Japanese). This interest encourages the readers to further research aspects of Japanese life that they may come across in the manga that they read, some even going on to study the language and history formally. This is clearly evident in the growing number of manga courses being taught at universities throughout the world, and in Japan of course. The field of study that this is relevant to is Japanese Studies, and to research this topic I will locate and read published articles about the global popularity of manga, and any previous research I can find on manga's educational capability, as well as citing particular manga series, such as those mentioned above, to provide examples of the content of manga.

The Objectivist Lens in the Search for Origin: Dante and Modernist Poetics

Ronald Lee
Monash University

Objectivist poetics proposes art as the labour whereby one can restore man and language to a Paradisal natural state where the word is directly linked to the object it represents (the referent). The genesis of a work of art is 'original' not necessarily because it came first, but in the sense that it leads towards the origin. In the De Vulgari Eloquentia and the Comedy, Dante's attack on verbosity in language and attempt to recover a natural language demonstrate how Dante can be considered a direct predecessor to Modernist and Objectivist poets: Dante develops a poetic style that is accessible to all readers and directed towards the linkage of the word with the natural referent. Dante is fundamentally linked to poets such as Ezra Pound, T.S. Eliot and Louis Zukofsky, whose major works The Cantos, The Waste Land, and "A" respectfully expand the themes of labouring to restore the natural state. In these works, the usage of words and the metaphoric evocation of light are considered types of labour that purify language and lead towards the recovery of a natural origin. It is through the intensification of relations between objects in art that the poetic image is given its shape, which becomes a means of restoring language – creating original relations out of common words, using sound as well as meaning. The poetic image becomes an intellectual and emotional complex in an instant of time that opposes verbal abstractions in favour of natural perfection. Objectivist poetics becomes the lens that attempts to reveal natural perfection by focusing upon the object rather than verbal description. The subject of enlightenment is interpreted literally: light is what reveals objective perfection by restoring images that have been scattered across time and concentrates these previous experiences to result in original images being created.

FIRST EXPERIENCE WITH AIDR 3D FOR DOSE-REDUCED SCANNING OF CARDIOVASCULAR COMPUTED TOMOGRAPHY (CVCT) IMAGES

Rong Hui Chia
Monash University

BACKGROUND: X-ray radiation is now widely used in medical imaging. Although its effect on our bodies remains a controversial issue, people are still concerned of being exposed to unnecessary

radiation. A new iterative reconstruction technique, AIDR-3D, automatically calculates and adjusts the minimum radiation exposure for individual patient based on a pre-set level of image quality, thereby reducing radiation dose exposure to patients while maintaining high image quality and low noise Cardiovascular Computed Tomography(CVCT) images.

INTRODUCTION: This study was performed to investigate if better CVCT image quality can be achieved with the use of AIDR-3D on both raw data and image data space, as compared to the use of first generation-AIDR on image data alone.

METHOD: A retrospective trial was performed on 131 consecutive patients. Patients were randomised to undergo 320-row-detector CT using first generation-AIDR or AIDR-3D from December 2011 to January 2011. The quality of the CVCT images were assessed based on streak artefacts and image noise. They were also graded (Grade 1, 2, 3 or 4) based on mottle image noise. Quantitative analysis was done by calculating contrast-noise ratio (CNR) and signal-noise ratio (SNR), and prospective gating and exposure phase of 70-80% of R-R interval was used for patients with heart rate (HR) less than 65bpm.

RESULTS: The average image quality and mottle grade of CVCT images for both groups were almost similar. The average CNR and SNR of images of patients in the first generation-AIDR group were 3.83+/-0.34 and 2.03+/-0.53, while that of images for patients in the AIDR-3D group were 3.84+/-0.359 and 2.17+/-0.47 respectively. Images of patients in the first generation-AIDR group had only 0.283% more measured noise with an average CNR of 21.5+/-5.22 and SNR of 19.7+/-5.18, as compared to that of AIDR-3D images with an average CNR of 23+/-5.105 and SNR of 22.5+/-4.72.

CONCLUSION: Similar CVCT image quality can be produced with the use of AIDR-3D as compared to the first generation-AIDR, although there may be a small increase in noise produced in the images.

CHARACTERIZATION OF THE MEDIAL SEPTUM NEURONS USING PARVALBUMIN, HCN1, NECAB1, SATB1/2, ChAT and CALBINDIN

Rong Xian Chia
The Australian National University

The medial septum is a major contributor to the hippocampal theta oscillation. Declarative memory and learning depend on hippocampal theta oscillations and phase-coupled firing of the pyramidal cells. Three populations of medial septal neurons may regulate hippocampal activity via the septo-hippocampal pathway: cholinergic, GABAergic and glutamatergic neurons innervate the hippocampus. It was previously proposed that there are distinct types of septal GABAergic neurons which only innervated select and specific types of hippocampal GABAergic interneuron. I have started to investigate the molecules expressed by distinct populations of medial septal neurons. The molecules chosen for neurochemical classification of the medial septal neurons by immunohistochemistry were parvalbumin, hyperpolarization-activated cyclic nucleotide-gated cation channel 1 (HCN1), special AT-rich sequence-binding protein 1/2 (Satb1/2), N-terminal EF-hand calcium binding protein 1 (Necab1), calbindin (CB), and choline acetyltransferase (ChAT). This combination of molecules may help the classification of medial septal neurons. Based on the specific functions of these molecules, we hope to gain insight into the specific roles and functions of the characterised neurons. In combination with electrical recordings we may be able to relate the neuron types to the theta rhythm. By doing so, further medial septal neurons can be identified with specific protein markers to predict their firing patterns and specific innervations to the hippocampus. I have found that ChAT and parvalbumin or ChAT and Satb1/2 are never co-expressed by a neuron. In addition, all parvalbumin-immunopositive cells were HCN1-immunopositive. Lastly,

PV/Satb1/2 /HCN1-immunopositive neurons can be further differentiated into either Necab1-positive or Necab1-negative neurons. Future comparison of molecular phenotype and firing patterns of the medial septum cells will inform us of whether the diverse phenotype of medial septum cells can influence the type of hippocampal interneuron they innervate, which may be coordinating the observed theta-phase specific firing of interneurons important for learning and memory.

Lady Bay Beach- A 'Penal Colony'

Sally Alrich-Smythe
University of Technology, Sydney

My Essay question was as follows: "Taking as your starting point a museum installation or site or space in Sydney, critically trace the ways in which you think the ideas of at least two of the three themes allow us both to understand this site, and more generally, the present moment in which we live". The site of interest that I had chosen was Lady Bay Beach (otherwise named 'Lady Jane')- a nudist beach with vast colonial history. I was interested in looking at how the interaction of the three themes mentioned has shaped the social significance of the area today, while also noting their overlapping and ever-changing nature. I on numerous occasions visited the beach, and noted the attitudes of the people in the area. Besides this, a historical walk of the South Head itself was undertaken, and the information centre man briefly interviewed. Mitchell's Library proved to be a very useful source of research material. My research called upon analysis of colonialism, Aboriginalism, nudism and homosexuality. My project highlights the essential role of each of traditionalism, modernism and postmodernism when looked to as social concepts, and not periods. Nudism, postmodern in its capacity to shock, is also modern in its departure from the tradition of wearing clothes - but has become a tradition in itself to the area! In brief, my essay analyses the very construction of Lady Bay - a site that has proved to be very interesting, upon first glance.

Peptide Array Analysis of uPAR Interactome

Samyuktha Anand
Macquarie University

Urokinase plasminogen activator receptor (uPAR) is a cell membrane protein that plays a critical role in cancer metastasis including cell proliferation, invasion, adhesion, proteolysis and migration. To achieve these functions uPAR is known to interact with a number of other membrane proteins such as uPA, vitronectin (VN) and integrins. The uPAR•uPA complex initiates extracellular matrix proteolysis and uPAR•α5β1complex implicates cell signalling pathways. As a result, the roles of uPAR can be altered by its binding partners, thus it is important to understand the interactome of uPAR. In this study, we have employed the uPAR peptide array technique (15 mer sequence of amino acids with a 3 amino acid shift that covers whole uPAR sequences) to determine the binding sites between uPAR and other uPAR binding proteins including uPAR itself, uPA, VN and integrin fusion protein αvβ6. We also determined binding sites of non-fusion integrin proteins including αv, β1, β3 and β6. The results showed that uPAR, uPA, Vn and αvβ6 have a strong signal with clear binding site locations on uPAR peptide array blots. However, in the case of non-fusion integrin proteins αv, β1, β3 and β6, there was either no signal or only very weak signals that appeared. This result may indicate that uPAR interacts with integrin proteins when present as heterodimer and/or as αv-β subunit fusion. Interestingly, there is a common strong binding site of uPAR, uPA, Vn and αvβ6 in the domain 3 region of the uPAR, which may indicate that this binding site is a potential compatible binding site between uPAR binding proteins. Furthermore, as uPAR and their binding partners appeared to be highly expressed in cancer metastasis, in this study, synthetic

antagonist peptides will be approached to inhibit interactions of uPAR and its binding partners for therapeutic uses against cancer metastasis.

Bioarchaeological Fieldschool in Amarna, Egypt

Scott Allan
Macquarie University

During May and June 2012 I attended a bioarchaeological fieldschool in Amarna, Egypt looking at the skeletal remains from the South Tomb Cemetery of the ancient capital of the New Kingdom king, Akhenaten. This research is being conducted by Professor Jerry Rose of the University of Arkansas and a team of students where we attempted to determine cause of death and evidence of epidemic disease in the general population of the city during its short occupation, by looking at the skeletal remains recovered. We conducted a detailed analysis of individual skeletons to determine age and sex for comparative studies and any pathological anomalies of the bones to determine nutritional and dietary problems as well as the frequency of trauma in the population. The South Tomb Cemetery of Amarna was discovered in 2005 and has been identified as the missing cemetery of the general population of the ancient capital. A progressive excavation of the cemetery is being conducted each season with three excavations sites currently open over the site. After excavation, we analysed the skeletal remains and compared with previous seasons. Current findings show that poor childhood nutrition and diet have affected the growth and development of the population of Amarna. There is also a large increase in the death rate of individuals in the young adult age range (7-20 years old) which still does not have a clear cause. It has also been found that the population of Amarna were lower in stature then people in Egypt at other times in history and suffered from pathologies associated with poor nutrition such as cribra orbitalia. This paper will present the current findings of the ongoing analysis as well as more detailed discussion on some of the individual skeletons that I worked with from the South Tomb Cemetery.

From Progress to Process": Locating the Transformation of 'Progress' within Australian History

Thomas Grainger
University of Technology Sydney

This thesis seeks to explore whether historical narratives can shift over time based on societal contexts and influences from both the realms of global politics to the rise of popular culture. This research has been carried out through using a particular historical site: The Female Orphan School Parramatta, as a vehicle from which some of the key ideas in history have developed. From here, the socio-cultural frames of Modernity and Postmodernity have been used a central guiding source to extrapolate understandings in the way Australia's identity has been manipulated through the shift in historical narratives. The background to this research focuses heavily on Australia's colonial roots ingrained within Enlightenment philosophy, for explaining how one historical narrative, the 'progress myth' came to define Australia's politicised existence. This provides a springboard for comparing the prevalence of similar narratives today, those ingrained within a contemporary culture where reality television has become a powerful influence in the process of storytelling. This thesis aptly concludes that history is not a product of the past, but rather, a product of contemporary society's knowledge. It is the relative construction of history and its multiple truths which guides a particular society, like that of the Australian community, in understanding itself. History is yet another discursive construction validated by the dominance of the media and now, popular culture through power struggles, what Foucault calls a 'battle for truth'.

Lights, Camera, Reaction!

Tom Macken
UTS

In my essay, I wanted to look at the role of film and how it endorses, reflects and creates the economic, social, cultural and political fabric of society today. Within the context of exploring modernist and postmodernist ideas and how they influence the world today, film provides a useful means of tracing their history, identifying their current forms and providing a lens to perceive their future impact. Through examining the role of film, I tried to draw attention to the inherent flaws in the notion of modernity and progress that are propagated through the screen and find their form in society today in the pillars of capitalism, individualism, consumerism and secularism. I wanted to explore the decadence of modernity and the role of film in providing an analogy of culture to perceive the gradual demise of Western civilisation. I postulated a new notion of postmodernity that seeks a return to a time predating modernity, imbued by a growing sense of detachment with the forces of modernism. Once again, an exploration of film and a host of recent films depict the existence of such sentiments within society today. Ultimately, the medium of film provided a lens to convey the idea that the demise of Western civilisation is inevitable if current modern notions of progress continue to dominate the global discourse. I believe what is needed is the rise of a new postmodernity that seeks a return to the verities of tradition.

Further Mathematical Formulations of the Titration Curve

Vincent Aw
Australian National University

The titration curve is a characteristic sigmoidal graph- a natural phenomenon that occurs frequently in aqueous chemistry. Many people are familiar with its form, but less familiar with the mathematical formulation of titration curves. Mathematical functions for the titration curve have been derived in the past, but are either empirical polynomial functions which do not give quantitative accuracy, or derived based on rearranging and substituting existing formulae (Aw & Jeng, 2012). We have discovered an original derivation for a set of mathematical functions which describes the monoprotic titration curve with quantitative accuracy. Our functions are unique as our derivation is based on aqueous equilibria principles and processes that occur during the titration- an original approach to mathematical formulation of the titration curve. Comparison shows an accurate match between theoretical and experimental curves, leading to the conclusion that our functions are plausible and work well. The mathematical functions we obtained are useful as they can produce theoretical titration curves given the concentration of acid, base, and the volume in the flask and burette of a monoprotic titration. Furthermore, the functions can generate the pH at any point during a given standardised monoprotic titration (Aw & Jeng, 2012). Our presentation will focus on the derivation of each of our set of monoprotic titration mathematical functions, and the testing of the functions through comparisons of theoretical and practical data which provide evidence for is functionality.

Nonlinear plasmonics: manipulating light at the nanoscale

Vincent Ng
Macquarie University

In principle, a computer that processes light instead of electronic signals would offer a dramatic increase in computational speed. However, operations that are simple to perform using electronics have been difficult to translate to optics. Plasmonics combines the best aspects of electronics (small dimensions and energy efficiency), and the best aspects of photonics (fast operating speeds and

parallel processing). A plasmon is formed when a light wave excites a metallic surface, and perturbs the free electrons of the metal, analogous to water waves. The combination of the oscillation of the light, and the electrons are collectively called the plasmon. A plasmon's electronic/optical nature is the ideal mechanism to combine these technologies. The challenge in using plasmons is that absorption in the metal rapidly causes dissipation. This motivates research in providing loss compensation, or amplification for plasmonic systems. One such amplification system is known as optical parametric amplification, in which the properties of a crystalline substrate cause light of one wavelength to amplify a surface plasmon of another wavelength. Published modelling has shown that the natural confinement of a plasmon promises to boost the efficiency of amplification significantly, but there are no experimental reports. We hope to explore this claim by demonstrating a basic nonlinear process¬—second harmonic generation—in a plasmonic waveguide, as an example of optical parametric amplification of plasmons. A plasmonic waveguide has been designed such that a plasmon may be excited at the interface of a gold film and a nonlinear crystalline substrate (lithium niobate). Experiments are underway to observe plasmon of the second harmonic wavelength (671 nm, red), under excitation by 1342 nm (IR) light using a leakage radiation microscope. Results of second harmonic generation in this design will presented at the conference.

Tension of 'Two Worlds': Tradition and Modernity

Vivienne Rontziokos
University of Technology, Sydney

The polarity between the disparate spheres of Western modernity and Aboriginal tradition has ultimately prevented the possibility of an Indigenous modernity as Eurocentric and colonial conceptions of progress are discursively conceived as discordant with Aboriginal culture, society and traditions. This paper examines the infeasibility of an 'Indigenous modernity' through a critical examination of the dichotomous relationship between the traditional and the modern within Australian historical and contemporary contexts. The Eurocentric constructions of contemporaneity and Indigeneity as binary opposites is exemplified within Craig Ruddy's (2004) portrait, 'David Gulpilil, Two Worlds', which has been utilised within this paper as a contemporary example of the continued collision of the two spheres. Through an analysis of qualitative data and an extensive literary review of primary and secondary sources, this paper illustrates the paradox of these opposing trajectories through an examination of the constructions of Aboriginality within social, historical, political and cultural contexts. It further analyses the reductionist classifications of homogeneity, Otherness, primitivism and ahistoricism and the way in which they have disallowed Indigenous peoples from accessing Enlightened notions of progress. The disparity between Aboriginal tradition and modernity is seen to be furthered by the processes of Western identity formation which saw the effective establishment of a dichotomous relationship between the 'ancients' and the 'moderns' so that the colonialists could distinguish their progression. The Eurocentric construction of Indigeneity is seen within this paper to have ultimately denied the possibility of an Aboriginal modernity, for the fundamental function of 'the Other' throughout history has prevented Indigenous people from progressing beyond the categorisations of traditional, ancient and oppositional to the modern. This paper, therefore, concludes that the idea of an Indigenous modernity remains an abstraction for the discursive constructions of the modern the traditional persist as mutually exclusive.

The Impacts of Marine Microplastics on Salp Feeding in the Tropical Pacific

Wing Yan Chan
The Australian National University

While phytoplankton remove atmospheric CO2 through the process of photosynthesis, salps (filter-feeding pelagic tunicates) feed on them and package them into relatively large, fast-sinking faecal pellets and transport their newly-fixed carbon to the deep ocean. For this reason, the grazing activities of salps are crucial to the maintenance of a steady atmospheric CO2 level. However, the discovery of a massive swirl of plastic waste twice the size of Texas (i.e. the Great Pacific Garbage Patch) has raised concerns over the effects of plastics on the feeding activities of marine lives. Specifically, although the impacts of macroplastics on marine mammals have been well-documented, the impacts of microplastics on filter-feeders have not been investigated. This study marks the first attempt to investigate the impacts of marine microplastics on salp feeding and their carbon export efficiency in a series of feeding experiments. A total of six feeding experiments were conducted on 12 live salps collected at six stations by neuston and meter nets during a cruise from Hawaii to Tahiti on board the SSV Robert C. Seamans. Fluorescent polyethylene microspheres 90-106 µm in size were used to simulate the presence of microplastics and a salp's response to the microspheres was carefully documented. Salps ranged from 1.4 cm to 5.1 cm in size were subjected to a microsphere concentration of between 2.1 to 4.2 microspheres/ ml in a 950ml jar. This study reveals a size-specific response of salps to the presence of polyethylene microspheres. Ingestions of microspheres occurred only in salps > 3cm. No ingestion of microspheres was observed in salps < 3cm, instead, a cluster of microspheres was found in their oral openings, suggesting the clogging of their feeding apparatus. The results indicate that marine microplastics are likely to have size-dependent negative impacts on salp's feeding and their downward carbon flux efficiency.

Person Information Management and Social Media

Yu Zhao
The University of Sydney

Computers are a meaningful data source for users to see what they have done, what they are doing, and what they will do. In this project, it is proposed that this application runs solely on the Google's Chrome browser as a browser extension. This application is able to retrieve a user's emails and posts from his/her Gmail account and Facebook account, and display data retrieved in a graphical manner. It is designed to help people manage their email and Facebook history, and understand their personal usage of email accounts and Facebook accounts better. Generally, a bottom-up methodology is used in the research. First, a literature survey is done on the past work of the field of Information extraction and Information Management. Then, two subsystems, the Gmail subsystem and the Facebook subsystem, are designed and implemented. Next, an integration of the two subsystems is designed and implemented. Last, a usability test is completed on the integrated system and adjustment is made based on the feedback of the usability test. Personal information management is a relative new and meaningful topic. The aim of this topic is to let people better understand themselves through the use of computer-based information tracking. The most common data sources tracked by computers are a user's email account and his/her social media accounts. And general information and web-based services provided by companies are also used to redraw the path that a user has gone through. As the usability test is scheduled for August 2012, only a preliminary conclusion is available. During the design and implementation of this proposed browser extension, we take usability issues and comments from other researchers into account. We take every opportunity to improve the extension, and thus we draw the preliminary conclusion that this Chrome browser extension is useful for people's daily lives and able to provide meaningful information to the users.

The Power of Language in bringing about Social Inclusion for people with Autism

Yvette Hopper
University of Wollongong

Autism is increasingly becoming a familiar topic among families, communities and organizations around the world, since the disability is estimated to affect 1 in 110 individuals. Autism ignores social barriers and can affect anyone regardless of their race, background or age. Although the disability can hinder a person's ability to engage in social interaction, it is vital that the discourse around autism is socially inclusive. Social inclusion is a popular topic among politicians, yet its implementation is difficult, within the context of autism, since the discourse around autism frames it in such a way as to perpetuate social exclusion for people with autism. This poster investigates the power of language in bringing about social inclusion for people with autism. It explores the discourse around autism and identifies how it naturalises socially exclusive terms into mainstream language. Furthermore, since both verbal and written communication can significantly contribute to social inclusion or exclusion, the poster examines and contrasts two other posters which aim to inform the community about autism and encourage them to participate in an event to raise awareness about the disability and its effect on people. It considers the language and symbols used in each poster and evaluates the extent to which they encourage social inclusion for people with autism. Drawing on concepts within the fields of symbolic interaction, discourse analysis and dramaturgy, I seek to understand the effect language can have on society, and increase consciousness of how language contributes to the domination of people with disabilities by people without disabilities. Social inclusion is not just a sociological concept, it is something that many governments claim to aspire to. It is therefore essential that we consider means of changing the discourse and increasing people's awareness about socially inclusive language: this will help us create a socially inclusive society.