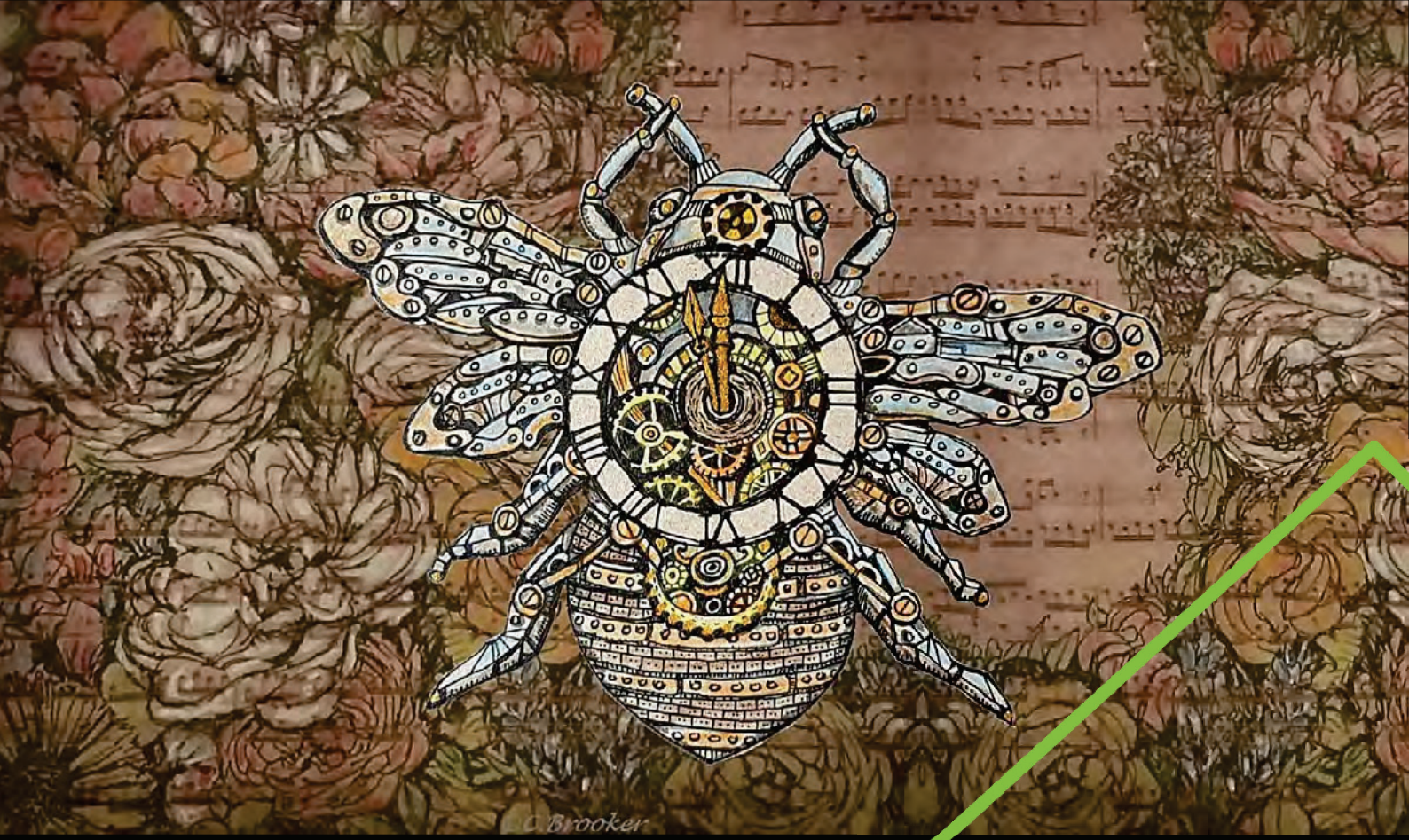

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Acknowledgement of Country

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We recognise the strength, resilience and capacity of the Aboriginal community and pay our respects to the Elders past, present and future.

Front cover artwork: "Robo Bee" by Cassandra Brooker who is currently doing a PhD by Creative Practice in Peace Studies

Session One

Oorala (E022)

Theme:
Genetics

Potential for using genomic information to define genetic grouping in genetic evaluation of sheep

Shweta Sahoo,

PhD | Animal Genetics and Breeding Unit

Biography

Shweta Sahoo is a PhD candidate at the Animal Genetics and Breeding Unit, UNE. Shweta is a veterinarian by profession. Her Master's dissertation was based on genetic evaluation for reproductive traits in crossbred goats which included exploring genetic diversity using pedigree information, genetic evaluation via multivariate animal models and random regression models along with laboratory training for PCR-RFLP analysis. Her current research focuses on elucidating new strategies to define genetic groups for the Australian sheep population. Her research interests include quantitative genetics, statistical genetics, genomics, and bioinformatics.

Abstract

Knowledge of genetic parameters on economically important traits is essential for genetic evaluation of animals. However, incomplete pedigree information creates gaps in the relationship matrix between animals, posing a challenge for accurately predicting breeding values. This work aims to review prior research on mitigating the impact of missing pedigree by defining genetic groups and identifying new genomic-based grouping strategies. Quaas (1988) proposed including unknown genetic groups (UPG) in an animal model to account for differences in the genetic merit of animals without pedigree. Genetic grouping of animals can be based on year of birth, geographical location, and selection path (Westell et al., 1988). The genomic era enables deriving genomic relationships among animals, and these can be used as an additional source of information for genetic grouping. Information on pedigree, phenotypes, and genotypes is used nowadays in genetic evaluation, known as the single-step genomic evaluation using the best linear unbiased prediction (ssGBLUP) method (Aguilar et al., 2010). In ssGBLUP, combining pedigree and genomic relationships matrices results in a unified relationship matrix known as the H matrix (Misztal et al., 2013). UPG are included in genetic evaluation models under different assumptions, however, biased estimates are often obtained after including UPG in mixed model equations. Legarra et al. (2015) introduced the concept of metafounders to explore alternatives to UPG. However, including genomic-base grouping in genetic evaluation is yet to be further explored. Future studies should assess the possibility of constructing genetic groups based on both pedigree and genomic information, offering insights into subpopulation variation and potentially reducing the number of groups, decreasing computational time in future genetic evaluation.

Keywords: genetic groups, unknown parent groups, metafounders, ssGBLUP

References

Aguilar, I., Misztal, I., Johnson, D. L., Legarra, A., Tsuruta, S., & Lawlor, T. J. (2010). Hot topic: a unified approach to utilize phenotypic, full pedigree, and genomic information for genetic evaluation of Holstein final score. *Journal of Dairy Science*, 93(2), 743-752. https://doi.org/10.3168/jds.2009-2730

Legarra, A., Christensen, O. F., Vitezica, Z. G., Aguilar, I., & Misztal, I. (2015). Ancestral Relationships Using Metafounders: Finite Ancestral Populations and Across Population Relationships. *Genetics*, 200(2), 455-468. https://doi.org/10.1534/genetics.115.177014

Misztal, I., Vitezica, Z. G., Legarra, A., Aguilar, I., & Swan, A. A. (2013). Unknown-parent groups in single-step genomic evaluation. *Journal of Animal Breeding and Genetics*, 130(4), 252-258. https://doi.org/10.1111/jbg.12025

Quaas, R. L. (1988). Additive Genetic Model with Groups and Relationships. *Journal of Dairy Science*, 71, 91-98. https://doi.org/10.1016/s0022-0302(88)79986-5

Westell, R. A., Quaas, R. L., & Van Vleck, L. D. (1988). Genetic Groups in an Animal Model. *Journal of Dairy Science*, 71(5), 1310-1318. https://doi.org/10.3168/jds.S0022-0302(88)79688-5

Non-canonical Domain Integration Shaped NBS-encoding Genes for a Potential Novel Class of Resistance genes in Myrtaceae

Tamene Tolessa

PhD | School of Environmental & Rural Science

Biography

Tamene Tolessa is a PhD candidate at the University of New England, Australia. He previously worked with the Ethiopian Institute of Agricultural Research from a Junior-to-Associate Researcher as a breeder of cool season food legumes and served as leader of the Ethiopian national faba bean and field pea research program for three years. He worked as a research associate for International Livestock Research Institute, a CGIAR centre based in Addis Ababa, Ethiopia, for four years. His PhD project is focused on characterizing resistance gene diversity and evolution in the genomes of Myrtaceae family.

Abstract

Plant intracellular nucleotide-binding sites (NBS) and leucine-rich repeat (LRR) receptors underwent extreme diversification as a result of co-evolutionary struggle against pathogen effectors. However, the extent of NBS-encoding gene diversity in the non-model plants is largely unknown. This project comprehensively analysed NBS-encoding gene repertoires in long-read sequences of 22 Myrtaceae species. It identified 64.1k NBS-encoding genes in varying form of genomic organisation, including clusters and pairs among 924.8k protein-coding gene models. This analysis detected 236 unique non-canonical domains (NCDs) integrated into the NBS-encoding genes, with varying frequencies of occurrence among the species. Domains with known functions, including disease resistance via ATP-ADP exchange, DNA-binding, Ca^{2+} binding, and carbohydrate-binding, were prevalent. Three-quarters of the identified NCDs were unevenly distributed and occurred in few species, suggesting ongoing, repeated integration of new domains. The Jacalin (J) domain is highly expanded across all Myrtaceae species in genes containing the TIR and NBS domain, but lacking the LRR domain. Instead, these 'TNJ' genes contained up to 10 copies of Jacalin in the C-terminal position. TNJ genes form a monophyletic group nested among the TNL. Further investigation of TNJ demonstrated conservation of important NB-ARC motifs and TIR-domain functional amino-acid residues, including the catalytic glutamic acid. Hyper-variable sites and signals of positive selection are clustered in the Jacalin region of TNJ, similar to those observed in LRR. This suggests Jacalin may have a role in pathogen recognition specificity, and that TNJ is potentially be a new family of a resistant gene in Myrtaceae with Jacalin as a substitute for LRR. The result further shows that different plant families could harbour unrecognised diversity in resistance gene classes that have evolved in response to lineage-specific stressors.

Investigation of Genotype Imputation Accuracy in Single-Breed, Cross-Breed and Multi-Breed Australian Beef Populations

Yaser Fazel

PhD | Animal Genetics and Breeding Unit

Biography

Yaser Fazel completed a Bachelor's degree in Animal Science in 2010 at Birjand University, Iran followed by a Master's degree in Animal Genetics and Breeding with a focus on statistical analysis of milk yield in Holstein cows at Shahid Bahonar, University of Kerman, Iran, in 2013. He then worked as a lecturer at Kabul University, Afghanistan, for nine years, before commencing his PhD at the University of New England in December 2022.

Abstract

Imputing genotypes from a low-density Single Nucleotide polymorphism (SNP) chip to a high-density SNP chip using information from the reference population has drastically reduced cattle genotyping costs (Garrick, 2011; Piccoli et al., 2014). This technique is efficient when the target and reference populations are from the same breed. However, when there are different breeds in the reference and target populations or a poor relationship between target animals and the reference population, the imputation becomes challenging because of different levels of Linkage Disequilibrium (LD) (Lund et al., 2014) and haplotype diversity (Berry et al., 2014; Hozé et al., 2013). Low accuracy in the imputation can cause an inaccurate estimation of genomic breeding values, which finally decreases the genetic gain in a breeding program. Therefore, it is important to study the factors that affect the imputation accuracy in multi-breed populations and develop a method to maximise the imputation accuracy. In this study, the genomic information of three breeds of beef cattle in Australia will be used to assess the imputation accuracy in single-breed versus multi-breed populations in different scenarios based on different SNP chip densities, the size of the reference population, and different combinations of breeds in the reference panel. The FImpute (Sargolzaei et al., 2014), Beagle (Browning & Browning, 2009), and EagleImp (Wienbrandt & Ellinghaus, 2022) software will be used to compare imputation algorithms. Finally, the average Pearson's correlation between imputed and actual genotypes will be used to calculate the imputation accuracy in each scenario.

References

Berry, D., McClure, M. C., & Mullen, M. P. (2014). Within-and across-breed imputation of high-density genotypes in dairy and beef cattle from medium-and low-density genotypes. *Journal of Animal Breeding and Genetics*, 131(3), 165-172.

Browning, B. L., & Browning, S. R. (2009). A unified approach to genotype imputation and haplotype-phase inference for large data sets of trios and unrelated individuals. *The American Journal of Human Genetics*, 84(2), 210-223.

Hozé, C., Fouilloux, M.-N., Venot, E., Guillaume, F., Dassonneville, R., Fritz, S., Ducrocq, V., Phocas, F., Boichard, D., & Croiseau, P. (2013). High-density marker imputation accuracy in sixteen French cattle breeds. *Genetics Selection Evolution*, 45, 1-11.

Sargolzaei, M., Chesnais, J. P., & Schenkel, F. S. (2014). A new approach for efficient genotype imputation using information from relatives. *BMC genomics*, 15(1), 1-12.

Wienbrandt, L., & Ellinghaus, D. (2022). EagleImp: fast and accurate genome-wide phasing and imputation in a single tool. *Bioinformatics*, 38(22), 4999-5006.

Session One

Arts (E011), A2

Theme:
Education

Examining Australian students' achievement in standardised assessments from 1995 to 2022

Dr Sally Larsen

Academic (Early Career Researcher) | School of Education

Biography

Sally Larsen is a lecturer and researcher in the School of Education at UNE. She graduated with a PhD in educational psychology in July 2022. Her research focuses on development of academic skills and behavioural traits from early childhood through to adolescence. She is also interested in uses and misuses of standardised assessment data in research and educational policymaking. Prior to beginning a research career Dr Larsen was a secondary school English and French teacher, and the manager of the Academic Development Study of Australian Twins at UNE from 2012 to 2018.

Abstract

Standardised tests of academic basic skills are an established feature of contemporary Australian schooling. Results of assessments are widely reported in the media, have direct influence on educational policymaking and are used as evidence in evaluations of educational systems in Australia. Given the importance of test data for these purposes, it is important that results of the major standardised assessments are interpreted holistically. This paper therefore aimed to collate publicly-available, longitudinal data from the four major assessment programs undertaken by Australian students. Results are reported from three international assessments, the Progress in International Reading Literacy Study (PIRLS), the Trends in International Mathematics and Science Study (TIMSS), and the Programme for International Student Assessment (PISA), along with the only Australian assessment, the National Assessment Program: Literacy and Numeracy (NAPLAN). Long-term trends in average achievement, and proportions of students falling into achievement bands are reported across all available assessments. Of the four test programs, only PISA demonstrated systematic declines in average scores over time. For the remaining three programs, results in the primary school grades showed initial improvements that were subsequently maintained over remaining iterations of the tests. In secondary school, students' average results neither declined nor increased appreciably over time. The consensus of the four largest assessment programs, undertaken by Australian students since 1995, fails to support the prevailing narrative of a broadscale decline in academic skills attainment. Implications of these findings for policy and public perceptions of education in Australia will be discussed.

Exploring Preschool Teachers' Roles and Practices in Children's Play in the Kingdom of Saudi Arabia

Asma Hulayyil Aljohani

PhD | School of Education

Biography

Asma Aljohani is a PhD candidate at the University of New England conducting research into Early Childhood Education (ECE) in Kingdom of Saudi Arabia (KSA). Before coming to UNE, she taught in the Early Childhood Department at Taibah University, KSA, for over ten years. Asma completed her Masters of Education in the United Kingdom, where she researched the effectiveness of iPad apps in the classroom to support literacy in primary education in the UK. Her acceptance into PhD is associated with a research project focused on exploring the perspectives of preschool teachers on play-based learning (PBL) in KSA. Her unique cultural knowledge positions her to effectively investigate the application of PBL within the KSA socio-cultural context. Her career plans for the future include presenting the findings of her research to the KSA Ministry of Education to improve the quality of ECE and returning to KSA to more effectively teach undergraduate and postgraduate students at Taibah University.

Abstract

Play is a culturally and socially situated construct, thus people from different cultures vary in how play is perceived, and the practices and how best to pedagogically support children's learning through play. In recent years, the Kingdom of Saudi Arabia (KSA) government has mandated the implementation of Play Based Learning (PBL), a Western approach to learning and development, in KSA preschools. However, the KSA's social, cultural, and religious context can be expected to influence preschool teachers' practices of play and the relevant pedagogies to promote PBL. Therefore, this research explores how Saudi preschool teachers enact play and PBL in their practice. This study is guided by a qualitative research design informed by social constructivism and an indigenous methodology. Data collection involved twenty-one preschool teachers working in public, private and charity-based settings. Three data methods conducted for this study included semi-structured interviews, lesson plan documents, and focus groups. Findings demonstrated the roles that preschool teachers enacted varied based on their curriculum goals and their perspectives on the purpose for children's play. Therefore, KSA teachers' understandings of their roles in children's play can be grouped into five main categories, *Mukhatat* (Planner), *Laeib Musharik* (Co-player), *Alqayid Almuyasir (*Facilitating leader), *Musharaf Al Muraqib* (Supervising Observer), and, *Mutawir Al Daeim* (Developing Supporter). The most frequent role teachers engaged in was Mukhatat (Planner) and *Alqayid Almuyasir* (Facilitating leader) Role, which involved integrating teaching objectives, strengthening the relationship between teachers and children, enhancing Islamic knowledge and situating Saudi socio-cultural practices in children's play. While *Musharaf Al Muraqib* (Supervising Observer) Role, and *Mutawir Al Daeim* (Developing Supporter) Role was not common between preschool teachers, individual teachers still enacted these roles. These findings do not reflect the role of teachers in PBL as constructed by Western theories. This paper argues that there is a need for a clear and consistent KSA play-based learning framework to translate Western play-based learning pedagogies in ways relevant to KSA contexts.

Keywords: Play, and Play-based learning, Teachers' roles, Preschool, Kingdom of Saudi Arabia, Social constructivism, Indigenous methodology.

Australian Early Childhood Teachers' Perspectives and Experiences in Supporting Children who are Trans or Gender Diverse

Ariel Liddicut

PhD | School of Education

Biography

Ariel is an experienced Early Childhood Teacher with a passion for creating educational programs where children feel safe to be their authentic selves. Her interest in gender was ignited many years ago when she first had a child in her kindergarten class asserting their gender identity as other than their birth sex. This begun a journey of learning how best to support these young people. She holds a deep reverence for children and recognises the significance of the early years on lifelong outcomes. Her passions extend to social justice and environmental topics within education.

Abstract

People who are trans or gender diverse (TGD) have existed across cultures throughout history (Brill & Pepper, 2022; Roughgarden, 2013). People are increasingly willing to openly assert their gender identity as other than the one they were assigned at birth, and for many, these feelings are expressed from the early childhood years (Brill & Pepper, 2022; Ehrensaft, 2014; Fast & Olson, 2018; Olson, 2016). Most likely due to barriers to acceptance and other forms of discrimination (Conn et al., 2023; Galupo et al., 2020; Strauss et al., 2017), this group has some of the poorest mental health outcomes of any minority group (LGBTIQ+ Health Australia, 2021). This project combined case study methodology to gain a broad perspective of Australian Early Childhood Teachers' perceptions and practices in supporting the gender identity development of ALL children. This broad perspective is balanced by case study methodology to explore the impact these practices have had on a child who is TGD and their parent. The survey findings demonstrate that children who are gender expansive (GE) and TGD attend early years services across Australia. Teacher's capacity to effectively include them is predominately determined by their beliefs in gender diversity and their knowledge of gender inclusion strategies. Harmful and exclusionary practices of reinforcing binary gender stereotypes remain prevalent. In contrast, the case study documented one service's approach to supporting a young transgender child, revealing the protective impacts of empathetic, high-quality early childhood pedagogy. This research has the potential to serve as a guide for best practice gender inclusion in early education settings.

References

Brill, S., & Pepper, R. (2022). *The Transgender Child: A handbook for parents and professionals supporting transgender and nonbinary children* (Updated Edition). Cleis Press.

Conn, B. M., Chen, D., Olson-Kennedy, J., Chan, Y. M., Ehrensaft, D., Garofalo, R., Rosenthal, S. M., Tishelman, A., & Hidalgo, M. A. (2023). High Internalized Transphobia and Low Gender Identity Pride Are Associated With Depression Symptoms Among Transgender and Gender-Diverse Youth. Journal of Adolescent Health, 72(6), 877–884. https://doi.org/10.1016/j.jadohealth.2023.02.036

Ehrensaft, D. (2014). Found in transition: Our littlest transgender people. *Contemporary Psychoanalysis,* 50(4), 571–592. https://doi.org/10.1080/00107530.2014.942591

Fast, A. A., & Olson, K. R. (2018). Gender Development in Transgender Preschool Children. Child Development, 89(2), 620–637. https://doi.org/10.1111/cdev.12758

Galupo, M. P., Pulice-Farrow, L., & Lindley, L. (2020). 'Every time I get gendered male, I feel a pain in my chest': Understanding the social context for gender dysphoria. *Stigma and Health,* 5(2), 199–208. https://doi.org/10.1037/sah0000189

LGBTIQ+ Health Australia. (2021). *Snapshot of mental health and suicide prevention statistics for LGBTIQ+ people.* https://www.lgbtiqhealth.org.au/about

Olson, K. R. (2016). Prepubescent Transgender Children: What We Do and Do Not Know. In *Journal of the American Academy of Child and Adolescent Psychiatry* (Vol. 55, Issue 3, pp. 155-156.e3). Elsevier Inc. https://doi.org/10.1016/j.jaac.2015.11.015

Roughgarden, J. (2013). *Evolution's rainbow: Diversity, gender, and sexuality in nature and people.* University of California Press.

Strauss, P., Cook, A., Winter, S., Watson, V., Toussaint, D. W., & Lin, A. (2017). *Trans Pathways: The mental health experiences and care of trans young people.*

Session One

Arts (E011), A3

Theme:
Healthcare Perspectives and Partnerships

When Research Meets Resistance: Making Allies within Industry Partner Organisations

Bess Jackson

PhD | School of Health

Biography

Bess Jackson is a mental health and suicide prevention professional completing a PhD through the University of New England. Bess is the recipient of a PhD scholarship funded by StandBy Support After Suicide. Her PhD project is in the field of suicide postvention. Bess also works at her local Primary Health Network in the mental health, alcohol, and other drugs team. Bess's portfolio includes region-wide suicide aftercare programs, as well as smaller, regional suicide prevention initiatives.

Abstract

Participation of industry partners in PhD projects has emerged as a pathway for exchanging industry insights, co-locating researchers, and providing financial support through research scholarships. However, it is important to note that support or endorsement of the research project may not be unanimous within the partner organisation. Misconceptions about research can conjure negative connotations and pose challenges even within such partnerships. The current project is funded through a scholarship by an industry partner; the project explores the sensitive implementation of outcome measures in a suicide bereavement support program. While working alongside the industry partner organisation, three types of progress barriers were encountered: capacity constraints, apathy, and apprehension. Overcoming these hurdles and fostering collaboration necessitated inventive approaches. In response, two innovative initiatives were introduced. The first initiative, the Learning Library, serves as a shared repository for research findings and resources, aiming to bridge the gap between academic research and practical applications. The second innovation, the Research Interest Group, provides a platform for open dialogues, encouraging cross-pollination of ideas and perspectives between academia and the industry. These initiatives are presently in the trial phase, displaying promising early outcomes in terms of increasing engagement and promoting collaborative problem-solving. The initiatives will be presented as a case study to other research students on innovative approaches to engaging with industry partners.

Predictors of variation in antibiotic prescribing among primary health care physicians: A systematic review

Gashaw Enbiyale Kasse

PhD | School of Health

Biography

Gashaw Enbiyale Kasse holds a DVM, MSc in Health Risk Management through the One Health approach and MSc in Biostatistics. He previously served as a lecturer at the University of Gondar, Ethiopia. Currently, he is a PhD candidate at UNE, conducting research on antibiotic prescription and shared decision-making in primary healthcare settings in Ethiopia.

Abstract

Background: The practice of health professionals when prescribing antibiotics in primary health care settings significantly impacts patient outcomes, antibiotic resistance and health care costs. Antibiotic prescription is a complex process influenced by various internal and external factors. This systematic review aims to summarize the available evidence regarding predictors of variation in antibiotic prescribing among physicians in primary healthcare settings.

Methods: This systematic review was conducted based on PRISMA guidelines. We included qualitative, quantitative and mixed methods studies that examined antibiotic prescription practice and factors associated with variability in antibiotic prescription among primary healthcare physicians working in clinics, outpatient centres and family practice. We searched studies from electronic databases - PubMed, ProQuest Health and Medicine, Web Science, and Scopus. The quality of the included studies was appraised using the Mixed Methods Appraisal Tool (Version 2018).

Results: Of the 1816 identified studies, fifty (49) studies spanning 2000-2023 were eligible for review. The factors influencing antibiotic prescription in primary healthcare settings were grouped into physician-related, patient-related, and healthcare system-related factors. Clinical guidelines, previous patient experience, physician experience, colleagues' prescribing practice, pharmaceutical pressure, time pressure, and financial considerations were found to be influencing factors of antibiotic prescribing practice. In addition, individual practice patterns, practice volume, and relationship with patients were also other factors for the variability of antibiotic prescription, especially for intra-physician prescription variability.

Conclusion: Variation in antibiotic prescription practices among primary health care physicians is complex, context-dependent and influenced by a combination of different factors. To address the factors that influence the variability of antibiotic prescription (intra- and inter-physician), interventions should aim to reduce diagnostic uncertainty and provide continuous medical education and training to promote patient-centred care.

Keywords: Antibiotic prescription, Antibiotic resistance, Physicians, Outpatient, Primary health care, Clinical decision-making.

What leads to breakthrough insights and how can they be generated more reliably?

Paul Hawkins

PhD | UNE Business School

Biography

Paul is the Chief Combobulator at Crazy Might Work, an award-winning, for-purpose innovation agency - and the first Australian company to be launched in Antarctica. The company exists to *liberate creativity in the service of humanity* by providing leadership development and breakthrough thinking capabilities to governments, agencies, multi-nationals and not-for-profits. Prior to founding Crazy Might Work, Paul worked for multi-nationals in over 20 countries, on programs ranging from mergers and acquisitions to global shared services. He is certified in neuroscience, innovation, and appreciative inquiry through the Neuro-Leadership Institute, Stanford and Case Western Universities respectively and is a facilitator of the 4-D program used by NASA. He chairs the board of a community services not-for-profit, as well as annual events like World Forum Disrupt and the Humans in Space Summit.

Abstract

'Breakthrough insight' refers to an advance in understanding that is (or leads to) an important discovery. In a post-industrial era characterised by 'knowledge work', as opposed to physical labour, this capacity for creative thinking is highly desirable in organisations (Forum, 2023). Today's workforce contains a record number of scientists and highly-qualified functional experts (Gastfriend, 2015) many of whom are working on intractable social, commercial and environmental challenges. For those at these frontiers (and those focussed on less lofty work) the ability to access breakthrough insights has the potential to accelerate innovation exponentially.

Whilst neuroscientific studies have enhanced our understanding of how insight occurs in a laboratory setting, they have not necessarily translated well into industrial, social or environmental applications, where breakthrough insights remain elusive and highly sought-after. This PhD.I innovation portfolio is an attempt to bridge that gap, delivering breakthrough insights where they matter most – in solving real-world social, commercial and environmental problems.

The portfolio was compiled using an action research approach to identify methods that precipitate breakthrough insights, thereby dramatically enhancing the quality and rate of innovation. These methods were drawn from a literature review that focussed on inventors, scientists, artists, authors and businesspeople with a reputation for serial innovation. The review included over 200 books, journal articles and research papers, as well as pattern analysis of the daily rituals of 161 creative thinkers, including scientists, authors and composers, as reported in Currey's ***Daily Rituals*** (Currey, 2014).

This was followed by a scan of contemporary innovation practices and a review of neuroscientific, social and psychological research to determine which of the identified approaches had support from scientific studies. Six practices emerged from this review, and these were provisionally included in Crazy Might Work's **Leading^{4}Breakthrough**® innovation methodology ('**L4B**') for testing in real-world situations.

References

Currey, M. (2014). Daily rituals: how great minds make time, find inspiration, and get to work (First published in paperback 2014 ed.). Picador.

Forum, W. E. (2023). Future of Jobs Report 2023 (INSIGHT REPORT, Issue. https://www.weforum.org/reports/the-future-of-jobs-report-2023

Gastfriend, E. (2015, 15 November 2015). 90% of All the Scientists That Ever Lived Are Alive Today. Retrieved 31/08/2023 from https://futureoflife.org/guest-post/90-of-all-the-scientists-that-ever-lived-are-alive-today/?cn-reloaded=1

Session Two

Oorala (E022)

Theme:
Turtles

Basking Platforms and Sonic Deterrent Devices: Testing their Efficacy in Freshwater Turtle Conservation Management

Jessica York

Honours | School of Environment and Rural Science

Biography

After completing her Bachelor Animal Science in 2015 and going on to work 5 years full time in the pet food industry, Jessica is back at UNE as a student completing honours part-time and also working part time as a Research Assistant in Ecology & Conservation at UNE, working in turtle research, soon to finish in November this year.

Abstract

Approximately 61% of turtle species worldwide are threatened or extinct. Increasing conservation concerns call for accurate and effective methods to detect and survey for freshwater turtles. Current survey methods, including some trap designs, fail to detect the juvenile cohort of turtles. Our study aimed to explore a possible method for detecting and monitoring all age classes of Australian freshwater turtles using basking platforms. Eighteen basking platforms were deployed over two field seasons in 2022 and 2023 throughout six sites in the New England Tablelands region of New South Wales where *Myuchelys bellii* and *Chelodina longicollis* occur. Remote field cameras set to photograph at 2-5 min intervals were used above and adjacent to each basking platform to capture turtle activity. Cameras were checked monthly. Both *M. bellii* and *C. longicollis* were detected on platforms. Platforms detected 1–20 *M. bellii* basking events per day and 1–30 *C. longicollis* basking events per day. For *M. bellii*, 28% were juveniles and 72% were adults. For *C. longicollis*, 24% were juveniles and 76% were adults. Turtle were detected basking between 06:10 h to 19:23 h except one *C. longicollis* was detected basking until 21:15 h. Our results suggest that basking platforms are a promising supplementary method to detect freshwater turtles, and for the threatened Bell's Turtle are useful for detecting juvenile cohorts. Refinements to the prototype basking platform and knowledge of optimal activity periods may further increase the value of basking platforms as a monitoring method.

References

Alvarez, J. A. (2006). Use of artificial basking substrate to detect and monitor Pacific pond turtles (Emys marmorata). *Western North American Naturalist, 66*(1), 129-131.

Dupuis-Desormeaux, M., McDonald, K., Moro, D., Reid, T., Agnew, C., Johnson, R., & MacDonald, S. E. (2021). A snapshot of the distribution and demographics of freshwater turtles along Toronto's Lake Ontario coastal wetlands. *Journal of Great Lakes Research, 47*(2), 283-294.

Lovich, J. E., Ennen, J. R., Agha, M., & Gibbons, J. W. (2018). Where have all the turtles gone, and why does it matter? *BioScience, 68*(10), 771-781.

Ninja Turtles: high mobility and successful passage through common barriers to movement in a semi-terrestrial freshwater turtle

James Dowling

Honours | School of Environmental and Rural Science

Biography

James Dowling is a Bachelor of Science (Honours) student at the University of New England, School of Environmental & Rural Science. He received a Bachelor's degree in environmental science from the University of New England. His current research investigates the spatial use of freshwater turtles and how artificial barriers alter their movements.

Abstract

Anthropogenic landscape change due to urbanisation, agriculture and resource extraction inevitably results in linear barriers within the landscape. Artificial linear structures such as roads, fences, levees, and dams limit the movement of some species and further fragment residual habitat. In this study, we investigated the ability of Eastern long-necked turtles (*Chelodina longicollis*) to cross various terrestrial obstacles commonly encountered in their habitat. We focus on two types of fences (chicken wire and exclusion fencing) commonly used in agricultural systems and three sizes of rocks (gravel, gabion, and large boulders) often used for road construction, erosion control, and waterway stabilisation. We examined the success rates of turtles in crossing obstacles, the effect of fatigue on crossing attempts, and the impact of individual boldness on movement behaviour. Turtles displayed surprisingly high success rates in crossing gravel (85.4%), gabion (86%), boulders (73.3%) and hinged joint exclusion fencing (94.7%). Chicken wire style wire netting had no successful crossings (0%) despite 276 attempts. A significant fatigue effect was observed throughout the experiment, with turtles making 3.94 ± 4.93 fewer attempts at the end of the experiment (day eighteen) as opposed to day one. Individual boldness varied significantly between turtles with males showing lower latency to move values than females. Bolder turtles were found to dwell on or around obstacles for longer, however, boldness had no bearing on obstacle-crossing success. These results highlight the need for thoughtful selection of waterway and wetland infrastructure and the fatiguing impact of constant exposure to anthropogenic barriers for wildlife.

Keywords: Agriculture, Fence, Livestock, Riparian, Roads, *Chelodina longicollis*

Innovative strategies for protecting freshwater turtle nests from fox predation

Lou Streeting

PhD | School of Environmental & Rural Science

Biography

Lou Streeting is a PhD candidate at the University of New England. Lou is evaluating conservation strategies for the endangered western saw-shelled turtle (*Myuchelys bellii*), including the protection of nests from predation by foxes, and the artificial incubation of eggs and release of turtle hatchlings to reinforce wild populations. Lou's PhD research journey began with finding the first recorded live *M. bellii* nest and she has now protected or released more than 3,500 hatchlings into the wild.

Abstract

The introduced red fox (*Vulpes vulpes*) is a significant predator of Australian freshwater turtles and their nests (Chessman 2022), and current fox control measures are insufficient to mitigate their impact on turtle populations (Spencer *et al.* 2017). The western-saw shelled turtle (*Myuchelys bellii*) is an endangered freshwater turtle endemic to Australia's New England Tableland region. *M. bellii* populations are aging, and with more than 97% of nests raided by foxes each breeding season, there is minimal juvenile recruitment. We installed wire mesh and steel cages to individually protect turtle nests (n = 49) and 100% of those nests escaped predation. However, the window of opportunity to find and protect *M. bellii* nests is narrow because nesting is synchronous following rainfall events, and nest predation typically occurs within 24–48 hours of egg laying. To overcome this, we designed and deployed temporary electric fences to deter foxes from high quality nesting areas while allowing the safe passage of turtles and other small wildlife. We evaluated the effectiveness of the fences using a paired treatment (fenced) and control (un-fenced) experimental design. The fences effectively reduced nest predation with significantly more intact nests (63 of 72 nests) found in the fenced treatment areas, and significantly more raided nests (49 of 57 nests) found in the un-fenced control areas. Fences were occasionally damaged by livestock, wildlife and flooding but, despite these breaks in functionality, foxes raided nests inside the fences on only two occasions. Our study demonstrates that electric fences can effectively protect entire *M. bellii* nesting areas from depredation by foxes, and have the additional benefit of safeguarding nesting females and hatchling turtles emerging from nests.

References

Chessman, B.C. (2022) Introduced red foxes (*Vulpes vulpes*) driving Australian freshwater turtles to extinction? A critical evaluation of the evidence. *Pacific Conservation Biology*, **28**, 462–471.

Spencer, R.J., Van Dyke, J.U. & Thompson, M.B. (2017) Critically evaluating best management practices for preventing freshwater turtle extinctions. *Conservation Biology*, **31**, 1340–1349.

Session Two

Arts (E011), A2

Theme:
History

The Southern Republican: The motivations and activities of an IRA Volunteer in the Republic of Ireland, 1975-2010

Kevin McQuillan

PhD | School of Humanities, Arts & Social Sciences

Biography

Kevin McQuillan has been a journalist for 40 years, as a radio/TV reporter/producer/foreign correspondent and News Director in Australia and New Zealand. He is undertaking a PhD in Creative Practice which has two parts: firstly, a novel which tells the story of IRA Volunteers in the Republic of Ireland between 1975 and 2015. Secondly, an exegesis which explores the difficulties faced when attempting to represent the activities, attitudes, and thoughts of the protagonists. It examines issues such as genre, authenticity versus accuracy in the creation of realistic characters, events, and dialogue; the motivation for joining nationalist movements and the level of support in the Republic of Ireland for the IRA.

Abstract

The paper explores the challenges in representing the motivations and activities of an IRA Volunteer in the Republic of Ireland between 1975 and 2015 in a work of historical fiction, titled '*The Southern Republican*'. This artefact is based on interviews with and research about Volunteers about their activities, research about the nature of the war in Northern Ireland, the limited amount of literature which deals with the level of support that existed in the Republic for the IRA, and the limited amount of literature which details the activities of the IRA in the south. There was widespread but tacit support for republican and nationalistic activities and Volunteers. The end result of the research is a narrative non-fiction/historical fiction novel, alongside an exegesis. This paper will present insights from the scholarly exegesis, or discourse, explaining the artefact and will cover issues relating to borders, sovereignty, and citizenship. This is a particularly useful insight into the resilience of the Irish seeking unity, as the island of Ireland moves slowly but inevitably towards a referendum on union. It will also outline the innovative ways in which the IRA and its Volunteers carried out their activities, as they aimed to create a sustainable united and democratic Ireland. The presentation will also outline issues relating to the telling of this story, the need to be innovative in its approach and resilient to sustain the writing of the artefact and exegesis.

References

Cain Web Service. 2023. Dublin and Monaghan Bombs - Chronology of Events. https://cain.ulster.ac.uk/events/dublin/chron.htm

Conway, K. 2014. Southside Provisional. Orpen Publishing. 2014

English, R. 2005. Armed Struggle: The History of the IRA. Oxford University Press.

Fils, L. 2010. Factual Fictions, Narrative Truth and the Contemporary American Documentary Novel. Newcastle upon Tyne: Cambridge Scholars Publishing.

Gill, P. 2016. Tactical Innovation and the Provisional Irish Republican Army in *Studies in Conflict & Terrorism.* Volume 40, 2017 - Issue 7: How Terrorists Learn: Adaptation and Innovation in Political Violence

Leahy, T. 2020. The Intelligence War against the IRA. Cambridge University Press.

Lukacs, G. 1937. The Historical Novel.

Ó Faoleán, G. 2023. *A Broad Church: The Provisional IRA in the Republic of Ireland 1980-1989. Merrion Press.*

Whyte, J. 1991. Interpreting Northern Ireland Oxford: Oxford University Press.

Offences by Australian officers in the First World War: From drunkenness to manslaughter

Des Lambley

PhD | School of Humanities, Arts & Social Sciences

Biography

Des Lambley graduated with a BA (Hons.) at UNE in 1988. He has a Master's degree in Civil Engineering and a Post Graduate Diploma in History. All of these tertiary studies were undertaken as a mature-age student. From an original Colonial farming family in the Hunter Valley, he served in the Vietnam War, and for 30 years worked in the NSW Public Service as a Policy and Research Analyst and Manager. His experience and interests have allowed him to drill deeply into some unknown aspects of Australian military history from the humanities perspective.

Abstract

This original, revisionist military history contributes to the collective knowledge about Australians and the First World War. Most have heard of the legendary Anzacs but do not know there were some 17,000 of them who were court martialled for a military crime. This number included 414 officers, most of whom were junior combat leaders. A constructionist approach is used to tease out their identity, their offences, and what might have prompted their indiscipline. Official, archived documents were sourced with relevant data extracted for analyses and narration. About two-thirds of the offences were for drunkenness or absenteeism. Others included cowardice, desertion, assault, fraud, disobedience, stealing and sodomy. About a quarter were found not guilty. Others were sentenced to gaol or dismissed from the service, but most were leniently punished.

Why did these officers offend? Did their courage fail? Were they overworked? Was there a link between battle stress, indiscipline and illness? It is concluded that there is strong evidence to support this hypothesis. Military and medical authorities conflicted over the jurisdiction of the man. The military frequently ignored medical advice and mentally or physically ill men were returned to the Front as promptly as possible. Many were traumatised by the threat or the return to danger in an environmental hell and horror of war. Some committed suicide on the battlefield, and others conveyed their mental burden home. They all volunteered to fight but were complex characters. Some were good and bad, heroic or weak, and some were luckless. Many were resilient.

References

National Archives of Australia.

National Library of Australia TROVE

Australian War Memorial Archives.

C.E.W. Bean, *Official History of Australia in the War of 914-18*, Vols. 1-12.

A.G. Butler, *Official History of the Australian Medical Services 1914-18*, Vols. 1-3.

War Office, Report of the War Office Committee of Enquiry Into 'Shell-Shock', 1922.

War Office, *Manual of Military Law*, 1914.

War Office, *The Kings Regulations*, 1912.

Peter Stanley, *Bad Characters*.

Horsewhipping, Honour Committees, and High Courts: Nineteenth Century British Gentlemen's Changing Approaches to Defending Reputational Honour

Denise Ganly

PhD | School of Humanities, Arts & Social Sciences

Biography

Denise Ganly holds a BS (Ohio), MHist (UNE). VC Scholar (UNE). Her PhD thesis considers the role gentlemen's clubs in played in shaping elite British masculinities during the course of the long nineteenth century. Imperialistic, aristocratic masculinities dominated British society in the metropole and the colonies during the long nineteenth century (1789-1914). Denise's thesis explores how gentlemen's clubs in Britain and Australia were integral to how these masculinities evolved during this period to become both hegemonic and subordinate whilst encompassing both normative and deviant behaviours.

Abstract

At the beginning on the nineteenth century, duels were the typical way gentlemen resolved matters involving reputational honour. Highly ritualised and governed by a code, duels were frequent, often fatal affairs conducted by the upper classes. However, as the century progressed, duelling became more egalitarian with middle class and working class men entering what they termed 'duels'. As a result of this bastardisation of the concept of the duel and other social factors, elite gentlemen began to look to other forms of dispute resolution, such as honour committees and legal action, in matters concerning honour and character. Duelling, however, never completely disappeared in the first half of the century making a brief resurgence during the 1860s. Here more pacific approaches to defending honour and status were dealt blows by contested findings of honour committees, lengthy legal processes with unsatisfactory outcomes, difficulty in determining who qualified as someone's peer, and a lingering duelling culture within the military. As such, there was an ebb and flow to defending reputational honour with elements of duelling culture remaining tenaciously embedded within the collective psyche of gentlemen until at least the *fin de siècle*. This paper looks in detail at a series of disputes over gentlemanly honour both in England and in Australia and shows that honour and its defence remained thorny issues throughout the period and that remnants of the duelling culture remained embedded in masculine performance until the end of the period.

Session Two

Arts (E011), A3

Theme:
Opinion, Impact and Prevention

Social Media Use and Opinion Strength: Does Opinion Type Matter?

Melissa Cox

PhD | School of Psychology

Biography

Melissa Cox completed her Bachelor of Psychology with Honours at UNE in 2018, and moved straight into her PhD in 2019. While Covid-19 delayed some aspects of her PhD, she is almost at the end of the road now, and looking forward to moving on with her career in research/teaching.

Abstract

Background/Aims: Social media has evolved from a method of keeping in touch to a source of entertainment and news. Its use has also been linked to opinion polarization, sometimes to extreme, potentially dangerous, levels. What is not clear, however, is whether the perception of an issue as fact- or belief-based relates to the strength of opinions, and whether this is related to the use of social media platforms. As extreme opinions can lead to negative outcomes in many domains, it is important to understand both how social media and the fact/belief dichotomy relate to the strength of opinions. This study aimed to determine whether fact- or belief-based opinions were stronger, and whether this was related to the duration of time spent on social media platforms.

Methods: HREC approval was granted on 2nd June, 2020 (approval number: HE20-093). Participants (N = 396, female = 312, male = 82, non-binary = 1,) completed surveys measuring social media usage and opinions on socially divisive issues (e.g., gender equality, climate change, etc).

Results: Fact-based opinions were significantly stronger than belief-based opinions, indicating that opinions are likely to be weaker if an individual acknowledges they are based on personal beliefs, rather than fact. This was independent of time spent on social media, which also did not moderate the relationship between opinion type and opinion strength.

Conclusions: Although the results suggest that opinion strength is not dependent on social media use, they do provide implications for the development of opinion change interventions, which should be designed with the specific type of opinion in mind.

Novel ways to Assess the Impact of Parkinson's Disease in Regional Areas

Alycia Messing

PhD | School of Psychology

Biography

Alycia Messing is a PhD candidate in the School of Psychology and also the recipient of the 'Science of HealthCare Delivery Scholarship' awarded by the New England Institute of Healthcare Research.

Abstract

In Australia, Parkinson's disease (PD) is the second most common neurological disorder and has no known cure. It is important that we can diagnose and monitor the progression of Parkinson's symptoms accurately. The 'Unified Parkinson's Disease Rating Scale' (UPDRS) is currently the gold-standard measure, but is limited in its ability to accurately and reliably reflect disease state and prognosis. Better measures of disease severity and deterioration in PD are needed. Here we focus on describing the preliminary results of longitudinal research where we aimed to examine whether and how measures of balance, motor function, brain activity, and cognition could provide a more accurate description of disease severity than is currently possible. We followed participants from the Hunter New England area across 12 months, with three assessments over that period, generating a rich longitudinal dataset with EEG, postural sway, finger tapping, cognitive and emotional functioning measures, as well as more traditional UPDRS scales for comparison. We also compared this data to measures collected from age-matched controls. This research has the potential to improve our ability to characterise disease progression in PD, to increase health literacy and improve psychosocial outcomes. With more precise tools, clinicians will be better able to assess their patients' need for treatments, as well as more accurately assessing the effectiveness of those treatments.

Session Three

Oorala (E022)

Theme:
Wildlife, Habitat, and Change

Public attitude towards snakes and frogs in Bhutan

Jigme Tshelthrim Wangyal

PhD | School of Environmental & Rural Science

Biography

Jigme has cultivated a profound affinity for nature from growing up in the wild. He holds a MSc in Biodiversity, Wildlife, and Ecosystem Health from the University of Edinburgh, a postgraduate diploma with honours in Wildlife Management from the Wildlife Institute of India, a BSc in Forestry from the Royal University of Bhutan, and a distinguished advanced diploma in Applied Forestry from North East Forest Rangers' College. His passion lies in exploring and studying nature in its untouched sanctuaries, far from urban confines. Beyond his vocation, he indulges in herping, focusing on amphibians and reptiles. He welcomes inquiries about these creatures or protected area management. As Allan Rufus aptly noted, 'Life is like a sandwich', and Jigme firmly believes that we shape its taste. He is currently pursuing a PhD at the University of New England in NSW, Australia, and greatly appreciates your well-wishes on this journey.

Abstract

The intricate interplay between humans and wildlife has long shaped cultural beliefs and conservation efforts. This study examines the attitudes of local communities towards two captivating wildlife species, snakes and frogs, within and outside protected areas in Bhutan. These species hold distinct ecological roles and cultural significance, making them ideal subjects for investigating the impact of residency on attitudes. Contrary to our initial hypothesis that individuals within protected areas might exhibit more positive attitudes due to increased wildlife interactions, our findings suggest that residency does not significantly influence attitudes towards snakes and frogs. Gender and age emerged as significant factors in shaping attitudes. Females exhibited distinct liking levels for both snakes and frogs, while age-group differences among males revealed varying sentiments. Furthermore, factors influencing positive attitudes differed between the species, with snakes being associated with religious and cultural significance, while perceptions of frogs were influenced by factors such as appearance and abundance. Additionally, our results indicated a significant distinction in attitudes towards snakes and frogs, revealing a complex interplay of factors shaping human-wildlife interactions. Fisher's exact test results to gauge conservation attitudes towards snakes and frogs unveiled that Age exerted an influence on frog conservation, whereas Gender impacted snake conservation ($p<0.05$). Importantly, no statistically significant disparities emerged in respondents' conservation attitudes towards these creatures concerning factors such as residency, education, and income. These findings challenge assumptions about the impact of residency on attitudes and provide valuable implications for wildlife conservation strategies in Bhutan and beyond, aiming to foster harmonious coexistence between humans and these captivating species.

Keywords: Attitudes, Bhutan, Conservation, Frogs, Snakes.

References

Brom, P., Anderson, P., Channing, A., & Underhill, L. G. (2020). The role of cultural norms in shaping attitudes towards amphibians in Cape Town, South Africa. PLoS One, 15(2), e0219331. https://doi.org/10.1371/journal.pone.0219331

Ceríaco, L. M. (2012). Human attitudes towards herpetofauna: The influence of folklore and negative values on the conservation of amphibians and reptiles in Portugal. Journal of Ethnobiology and Ethnomedicine, 8, 8. https://doi.org/10.1186/1746-4269-8-8

Devkota, D., Miller, D. C., Wang, S. W., & Brooks, J. S. (2023). Biodiversity conservation funding in Bhutan: Thematic, temporal, and spatial trends over four decades. Conservation Science and Practice, 5(5), e12757. https://doi.org/10.1111/csp2.12757

Dickman, A. J. (2010). Complexities of conflict: The importance of considering social factors for effectively resolving human–wildlife conflict. Animal Conservation, 13, 458-466. https://doi.org/10.1111/j.1469-1795.2010.00368.x

Farooq, H., Bero, C., Guilengue, Y., Elias, C., Massingue, Y., Mucopote, I., ... Faurby, S. (2021). Species perceived to be dangerous are more likely to have distinctive local names. Journal of Ethnobiology and Ethnomedicine, 17(1), 69. https://doi.org/10.1186/s13002-021-00493-6.

Fisher, R. A. (1922). On the interpretation of χ^2 from contingency tables, and the calculation of P. Journal of the Royal Statistical Society, 85(1), 87–94.

García-López, R., Villegas, A., Pacheco-Coronel, N., & Gómez-Álvarez, G. (2017). Traditional use and perception of snakes by the Nahuas from Cuetzalan del Progreso, Puebla, Mexico. Journal of Ethnobiology and Ethnomedicine, 13(1), 6. https://doi.org/10.1186/s13002-016-0134-7

Hothorn, T., Hornik, K., & Zeileis, A. (2006). Unbiased recursive partitioning: A conditional inference framework. Journal of Computational and Graphical Statistics, 15, 651–674. https://doi.org/10.1198/106186006X133933

Hunter Jr., M. L., Albright, J., & Arbuckle, J. (Eds.). (1992). The Amphibians and Reptiles of Maine. Maine Agricultural Experiment Station Bulletin 838.

Kellert, S. R., Black, M., Rush, C. R., & Bath, A. (1996). Human culture and large carnivore conservation in North America. Conservation Biology, 10, 977–990. https://doi.org/10.1046/j.1523-1739.1996.10040977.x

Kretser, H. E., Curtis, P. D., Francis, J. D., Pendall, R. J., & Knuth, B. A. (2009). Factors affecting perceptions of human–wildlife interactions in residential areas of Northern New York and implications for conservation. Human Dimensions of Wildlife, 14(2), 102-118. https://doi.org/10.1080/10871200802695594

Monaco, E. (2017). Preserving Bhutan's National Identity: An Analysis of Gross National Happiness as a Survival Strategy. European Journal of Sustainable Development, 6(3), 81-91. https://doi.org/10.14207/ejsd.2017.v6n3p8

Mullin, S. J., & Seigel, R. A. (2009). Snakes: Ecology and Conservation. Cornell University Press.

Phillips, S., Merson, M., Hristov, N., Allen, L., & Brodman, R. (2022). Indicator Species Reveal Environmental Health. Frontiers in Young Minds, 10, 718606. https://doi.org/10.3389/frym.2022.718606

Qualtrics. (2023). https://qfreeaccountssjc1.az1.qualtrics.com/survey-builder/SV_4N4K1aaEfqeQuJo/

R Core Team. (2023). R: A language and environment for statistical computing (Version 4.3.1) [Software]. R Foundation for Statistical Computing. https://www.r-project.org/

Rádlová, S., Janovcová, M., Sedláčková, K., Polák, J., Nácar, D., Peléšková, Š., Frynta, D., & Landová, E. (2019). Snakes represent emotionally salient stimuli that may evoke both fear and disgust. Frontiers in Psychology. https://doi.org/10.3389/fpsyg.2019.01085

Ríos-Orjuela, J. C., Falcón-Espitia, N., Arias-Escobar, A., Espejo-Uribe, M. J., & Chamorro-Vargas, C. T. (2020). Knowledge and interactions of the local community with the herpetofauna in the forest reserve of Quininí (Tibacuy-Cundinamarca, Colombia). Journal of Ethnobiology and Ethnomedicine, 16(1), 17. https://doi.org/10.1186/s13002-020-00370-8

Sangay, T., Rajanathan, R., Vernes, K., & Tighe, M. (2020). Local knowledge and attitude towards the Vulnerable Bhutan takin Budorcas whitei among residents living within its seasonal range. Oryx, 54, 359–365. https://doi.org/10.1017/S0030605318000418

Stanley, J. W. (2008). Snakes: Objects of Religion, Fear, and Myth. Journal of Integrative Biology, 2(2), 61-76.

Stanton, K. M. (2022). Frog Symbolism & Meaning & the Frog Spirit Animal. UniGuide. https://www.uniguide.com/frog-meaning-symbolism-spirit-animal-guide

The Constitution of Bhutan. (2008).

The Forest and Nature Conservation Act of Bhutan. (1995).

Thinley, P., Rajaratnam, R., Tighe, M., Vernes, K., Norbu, T., Dorji, R., & Tenzin, S. (2019). Understanding primate-human interaction: Socioeconomic correlates of local awareness and attitude toward the endangered golden langur Trachypithecus geei (Khajuria, 1956) in Bhutan. American Journal of Primatology, 81(6), e22995. https://doi.org/10.1002/ajp.22995.

Tighe, M., Muñoz-Robles, C., Reid, N., Wilson, B., & Briggs, S. V. (2012). Hydrological thresholds of soil surface properties identified using conditional inference tree analysis. Earth Surface Processes and Landforms, 37, 620–632. https://doi.org/10.1002/esp.3191

Tse-ring, K., Sharma, E., Chettri, N., & Shrestha, A. (Eds.). (2010). Climate change vulnerability of mountain ecosystems in the Eastern Himalayas; Climate change impact and vulnerability in the Eastern Himalayas – Synthesis report. Kathmandu: ICIMOD.

Wangyal, J. T. (2022). The Amphibians of Bhutan. Chimaira Science Paperback Vol. 3. Chimaira Buchhandels GmbH.

Wangyal, J. T., & Das, I. (2014). Status, distribution and conservation issues of the amphibians of the Himalayan country of Bhutan (Decline in the Eastern Hemisphere). In H. Heatwole & I. Das (Eds.), Conservation Biology of Amphibians of Asia (pp. 194–200). Amphibian Biology, Vol. 11. Natural History Publications (Borneo) Sdn Bhd, Kota Kinabalu.

Wangyal, J. T., Bower, D., Vernes, K., & Thinley, P. (2022). Employing citizen science to understand amphibian and reptile diversity and distribution in the Himalayan Kingdom of Bhutan. Global Ecology and Conservation, 37, e02157. https://doi.org/10.1016/j.gecco.2022.e02157

Wilson, J. W., & Primack, R. B. (2019). Conservation Biology in Sub-Saharan Africa. Open Book Publishers. ISBN Digital (PDF): 978-1-78374-752-8.

Wilson, T. V. (2008, February 5). How Frogs Work. HowStuffWorks.com. https://animals.howstuffworks.com/amphibians/frog.htm

Molecular ecology of New England Tablelands Bioregion endemic outcrop shrub populations

Peter Pemberton

PhD | School of Environmental & Rural Science

Biography

Peter is a PhD candidate at the University of New England. He is researching the molecular ecology of shrubs endemic to New England Tablelands Bioregion, which exist solely on granite outcrops. These shrub species may have no or low genetic migration between populations, which may decrease their adaptive potential.

Abstract

Granite outcrops often exist as terrestrial islands that are isolated in a larger landscape matrix, and shrubs are a significant component of outcrop vegetation. Many shrub species have gravity-dispersed seeds and are pollinated by insect species with limited ranges, and the insects may only be active within a single outcrop population. These characteristics will limit gene flow, and relatively small distances may be sufficient for allopatry if pollen or seeds are not transferred between disjunct outcrops (Hopper, 2009; Hopper et al., 2021). However, these shrub species have been able to persist in small and perhaps genetically disconnected populations. This scenario contrasts with general conservation biology strategies for preservation, which aim for large and genetically connected populations to maximise adaptive potential from increased and mobile genetic diversity (Lindenmayer & Burgman, 2005). A systematic review of molecular ecology papers, on outcrop systems similar to those in the New England Tablelands Bioregion and which measured population structure, migration rates and identified pollinators, indicated that species pollinated by invertebrates only had highly structured populations with low gene migration rates. Adaptive potential was not studied directly in any of these papers. This research will conduct molecular ecology and pollinator studies on several granite outcrop shrub species in the New England Tablelands Bioregion, to quantify genetic diversity and gene migration within and between isolated shrub populations, as possible proxies to indicate the adaptive potential. Low genetic diversity and no gene flow would indicate that the persistence of endemic outcrop species in small populations may be compromised by rapid climate change.

References

Hopper, S. D. (2009). OCBIL theory: towards an integrated understanding of the evolution, ecology and conservation of biodiversity on old, climatically buffered, infertile landscapes. *Plant and soil, 322*(1/2), 49-86. https://doi.org/10.1007/s11104-009-0068-0

Hopper, S. D., Lambers, H., Silveira, F. A. O., & Fiedler, P. L. (2021). OCBIL theory examined: reassessing evolution, ecology and conservation in the world's ancient, climatically buffered and infertile landscapes. *Biological Journal of the Linnean Society, 133*(2), 266-296. https://doi.org/10.1093/biolinnean/blaa213

Lindenmayer, D., & Burgman, M. A. (2005). *Practical conservation biology*. CSIRO Publishing.

Developing a Baseline for Biodiversity on Solar Farms using Environmental Impact Statements

Remo Boscarino-Gaetano

Masters (Research) | School of Environmental & Rural Science

Biography

Remo Boscarino-Gaetano is a Master of Environmental Science Student at the University of New England's School of Environmental and Rural Science. Originally from Canada, he received an Honour's Bachelor of Science degree from the University of Guelph, with a minor in Philosophy. He has worked with a variety of herpetofauna in North and Central America, and now in Australia. His current research focuses on evaluating solar farms as a potential avenue to contribute to conservation of native Australian fauna.

Abstract

The biodiversity crisis is exacerbated by a growing human population modifying nearly three-quarters of the planet's land surface area for anthropogenic uses. Habitat loss and modification represent the largest threat to biodiversity. As such, finding ways to offset species decline have been a significant undertaking for conservation. Landscape planning and conservation strategies can enhance habitat suitability for biodiversity in human-modified landscapes. Artificial habitat structures such as artificial reefs, nest boxes, chainsaw hollows, artificial burrows, and artificial hibernacula have all been successfully implemented to improve species survival in human-modified and fragmented landscapes. The development of photovoltaic systems (PV) is growing exponentially as the global shift towards renewable energy sources continues to rise. Large-scale renewable projects, such as photovoltaic solar farms have large space requirements and have the potential to displace local wildlife. This project attempts to determine the feasibility for 'conservoltaic systems' — photovoltaic systems which incorporate elements tailored specifically to enhance wildlife habitat suitability and species conservation. Artificial habitat structures can potentially lessen the impacts of industrial development (e.g., photovoltaic solar farms) through strategic landscape planning and an understanding of local biodiversity requirements to facilitate recolonization. 408 papers detailing the use of artificial habitat structures globally, and multi-purpose uses for solar farms were examined. Countries with high instances of research on artificial habitat structures, coupled with significant investments in photovoltaic infrastructure (Australia, Canada, Spain, the United Kingdom, and the United States) are prime candidates for the development of conservoltaic systems.

Disclosures:
This project did not require the use of animals, nor did it require funding as it is a literature review. The research was amalgamated through the support of staff and infrastructure at the University of New England.

Session Three

Arts (E011), A2

Theme:
Peace, Philosophy and Research Design

Building peace amidst violent conflict: women-to-women diplomacy, an innovative peacebuilding approach in Myanmar

Godwin Yidana

PhD | School of Humanities, Arts & Social Sciences

Biography

Godwin has over 20 years' experience in international development, conflict-sensitive development practice, conflict transformation and Peacebuilding, managing programs and projects across Africa, Australia, and Asia-Pacific. Prior to his PhD studies, Godwin was the International Programs Coordinator of Catholic Mission Australia, where he worked with overseas partners across Africa and Asia-Pacific to develop and implement sustainable development projects. Godwin holds an MA in Peace and Conflict Studies from the University of Sydney. His PhD project explores women's participation in the defunct Myanmar peace process through a Black feminist framework.

Abstract

Traditional conceptions of peacebuilding as a 'post-conflict', linear activity generally limit our understanding of the ways in which peacebuilding is pursued amidst ongoing violent conflict. This paper fills this lacuna by exploring how women civil society organisations in Myanmar have developed unique and innovative ways to build peace amidst continuing violent conflict. The paper contributes to existing feminist scholarship on women and peacebuilding by drawing on fieldwork conducted in Myanmar between September and December 2019 and the feminist concept of women-to-women diplomacy to locate and explore women's peacebuilding efforts grounded on common lived experiences, the furthering of women's agency, and an adherence to gender equality as a critical element of peace. The paper argues that women-to-women diplomacy is a peacebuilding approach that can help transform entrenched polarisation by seeing the humanity of the 'other' and locating shared spaces for collaboration, cooperation, and interethnic dialogue. The findings demonstrate the contribution of women-to-women diplomacy to peacebuilding as an alternative arena for networking and alliance building grounded on a shared vision of equal rights for all.

Key words: women's civil society organisations; gender equality; feminist, peacebuilding, inter-ethnic dialogue, women-to-women diplomacy.

References

Berry, M.E. (2018). *War, Women, and Power: From Violence to Mobilization in Rwanda and Bosnia-Herzegovina*, Cambridge University Press, Cambridge.

Björkdahl, A. & Selimovi, J.M. (2016). Gender: The Missing Pice in the Peace Puzzle, in O. Richmond, S. Pogodda & J. Ramovic (Eds.), *Palgrave Handbook of Disciplinary and Regional Approaches to peace*, Palgrave Macmillan, London.

Cárdenas, M. L. (2019a). Women-to-Women Diplomacy in Georgia: A Peacebuilding Strategy in Frozen Conflict, *Civil Wars*, 21 (3): 385-409. https://doi.org/10.1080/13698249.2019.1667713

Cárdenas, M. L. (2019b). Women-to-Women Diplomacy and the Women's League of Burma, in A. Kolås (Ed.), *Women, Peace and Security in Myanmar: Between Feminism and Ethnopolitics*, Routledge, London.

Cárdenas, M. L. & Olivius, E. (2021). Building Peace in the Shadow of War: Women-to-Women Diplomacy as Alternative Peacebuilding Practice in Myanmar, *Journal of Intervention and statebuilding*, 15(3): 347-366. https://doi.org/10.1080/17502977.2021.1917254

Cockburn, C. (2007). *From Where we Stand: War, Women's Activism and Feminist Analysis*, Zed Books, London.

---------- (2015). Transversal Politics: A Practice of Peace, *Pacifist Feminism*, 22. https://www.icip.cat/perlapau/en/article/transversal-politics-a-practice-of-peace/?pdf

Dincer, P. (2020). The Potential for Dialogical Transversal Politics and Coalitional Solidarities in the Contemporary Women's Movement in Turkey, *Women's Studies International Forum*, 80: 102366. doi:10.1016/j.wsif.2020.10236

‘Show Me the Money’: the challenge of funding a holistic and resilient future society

Liza Tolan

PhD | School of Humanities, Arts & Social Sciences

Biography

Liza is currently in her 2nd year of full-time PhD candidature at UNE, in the discipline of Philosophy, specialising in Political Philosophy. Her PhD topic is ‘Can Economic Limitarianism be Defended as a Political Imperative?’ Liza holds a first-class honours degree (majoring in Politics and Philosophy) from Monash University and a Graduate Diploma in Innovation and Service Management from RMIT. She has also worked for many years in the corporate sector, mainly in the area of organisational development. She is passionate about distributive justice, particularly in the context of wealthy societies.

Abstract

Resilience is an alluring notion, evoking images of enduring strength, health and vigour. A resilient system, human or otherwise, is holistically robust, with all components operating reliably well. In the system that is our society, we cannot claim that this is so. Large segments of the population are living in poverty or are severely disadvantaged, and urgent collective needs are neglected or underfunded. Funding is not the only obstacle, but it is a major one. There is abundant wealth in our economic system, but it is not finding its way to where it is really needed.

Observing this, Ingrid Robeyns in 2017 introduced the theory of economic limitarianism, which posits that in our non-ideal world it is not morally permissible for individuals to have surplus wealth. Such surplus has ‘zero moral weight’ when compared to urgent unmet needs, and thus should be heavily taxed. This idea is not unfamiliar, but Robeyns sets out to construct a coherent theoretical argument around a hitherto fragmented assortment of policy proposals.

The theory is intriguing, but has not been well-defended in the existing literature, either from a theoretical or normative perspective. There is a heavy reliance on moral arguments, which are of scant relevance - any coercive action by the state needs to be based on justice, not morality. Limitarianism, in some form, could conceivably be part of the solution to our collective problems, but a much deeper level of analysis is needed.

My research forensically examines assumptions around merit, desert, private ownership and even the justice of our entire economic structure. This conference paper describes what I have found so far.

Researcher Positionality: Ways to Include it in a Qualitative Research Design

Dr Prashneel Ravisan Goundar

Researcher | School of Humanities, Arts & Social Sciences

Biography

Dr Prashneel Ravisan Goundar currently works for the Student Scholarships Team at UNE. He is the author of Pursuing Divinity in Paradise (2020), In Simple Words (2017) and Writing and Publishing in Fiji (2018) an edited volume with USP Press. Goundar completed a Doctor of Philosophy in Linguistics from University of New England through the RTP International PhD scholarship funded by the Australian Commonwealth Government. His research interests are of interdisciplinary nature that sits across the three, distinct yet interrelated, fields of Applied Linguistics, Sociolinguistics and Educational Linguistics. His publications include research papers, books, book chapters, newspaper articles, and reviews.

Abstract

In qualitative research approaches, it is fundamental for investigators to highlight their position. In the social science disciplines, if one is doing a higher degree research, there should be a section that clarifies the researcher positionality. Making these declarations gives the study clarity and credibility in that the researcher is aware of how they fit in their 'insider and outsider hat' so to say. This paper discusses ways in which Masters and PhD scholars can explain positionality in their thesis. The author provides examples from his PhD thesis which looked at academic English writing skills of first-year undergraduate students. The examples will be helpful to novice researchers in eliminating any doubts that the thesis examiners may have. These practical steps will allow post-graduate students interested in this topic to navigate their way in providing precision on qualitative methodology and approaches employed in their study.

Keywords: researcher positionality, qualitative research methodology, insider-outsider, thesis, lived experiences

References

Ali, T., Buergelt, P. T., Maypilama, E. L., Paton, D., Smith, J. A., & Jehan, N. (2022). Synergy of systems theory and symbolic interactionism: a passageway for non-Indigenous researchers that facilitates better understanding Indigenous worldviews and knowledges. International Journal of Social Research Methodology, 25(2), 197-212. https://doi.org/10.1080/13645579.2021.1876300

Bourke, B. (2014). Positionality: Reflecting on the research process. The Qualitative Report, 19(33), 1-9. https://doi.org/10.46743/2160-3715/2014.1026

Foote, M. Q., & Gau Bartell, T. (2011). Pathways to equity in mathematics education: How life experiences impact researcher positionality. Educational studies in mathematics, 78, 45-68. https://doi.org/10.1007/s10649-011-9309-2

Goundar, P. R. (2023a). Application of Grounded Theory Methodology Using CEFR in the Field of Language Testing. Review of European Studies, 15(1), 1-10. https://doi.org/10.5539/res.v15n1p1

Goundar, P. R. (2023b). Writing Skills for Undergraduate Students in Fiji: Tackling Educational Inequalities, Facilitating Epistemic Access [Doctoral dissertation, University of New England]. Unpublished.

Holmes, A. G. D. (2020). Researcher Positionality--A Consideration of Its Influence and Place in Qualitative Research--A New Researcher Guide. Shanlax International Journal of Education, 8(4), 1-10. https://doi.org/10.34293/education.v8i4.3232

Kerstetter, K. (2012). Insider, outsider, or somewhere between: The impact of researchers' identities on the community-based research process. Journal of rural social sciences, 27(2), 7.

Kezar, A. (2002). Reconstructing static images of leadership: An application of positionality theory. Journal of Leadership Studies, 8(3), 94-109. https://doi.org/10.1177/107179190200800308

Lowndes, V., Marsh, D., & Stoker, G. (2017). Theory and methods in political science. Bloomsbury Publishing. https://doi.org/10.1057/978-1-137-60353-1

McMullin, C. (2023). Transcription and qualitative methods: Implications for third sector research. VOLUNTAS: International journal of voluntary and nonprofit organizations, 34(1), 140-153. https://doi.org/10.1007/s11266-021-00400-3

Mercer, J. (2007). The challenges of insider research in educational institutions: Wielding a double-edged sword and resolving delicate dilemmas. Oxford review of education, 33(1), 1-17. https://doi.org/10.1080/03054980601094651

Merriam, S. B., Johnson-Bailey, J., Lee, M.-Y., Kee, Y., Ntseane, G., & Muhamad, M. (2001). Power and positionality: Negotiating insider/outsider status within and across cultures. International journal of lifelong education, 20(5), 405-416. https://doi.org/10.1080/02601370120490

Rowe, W. E. (2014). The SAGE encyclopedia of action research. In: Thousand Oaks, United States: SAGE Publications Ltd.

Sanghera, G. S., & Thapar-Björkert, S. (2008). Methodological dilemmas: Gatekeepers and positionality in Bradford. Ethnic and racial studies, 31(3), 543-562. https://doi.org/10.1080/01419870701491952

Savin-Baden, M., & Howell-Major, C. (2013). Qualitative research: The essential guide to theory and practice. Qualitative Research: The Essential Guide to Theory and Practice. Routledge.

Session Three

Arts (E011), A3

Theme:
Vulnerabilities and Strengths

Health Vulnerabilities of the Female Sex Workers: A Qualitative Investigation from South-western Region of Bangladesh

Shaharior Rahman Razu

PhD | School of Health

Biography

Shaharior Rahman Razu is a PhD candidate in the School of Health, University of New England (Australia), and an Associate Professor (on study leave) at Khulna University (Bangladesh). Mr. Razu works primarily in the field of public health and gender issues using sociological perspectives. He previously participated in Doctoral Research Training offered by Chiang Mai University, Thailand, and has been awarded several grants/awards at both national and international level. Razu has published over 35 research articles, served as an editorial board member/reviewer, attended many international conferences, training, workshops, seminars, and is engaged in numerous social activities.

Abstract

Health issues of the marginalized social groups are often ignored in our society. The present study investigates the health vulnerabilities of female sex workers (FSWs) in Bangladesh following a qualitative research approach. 21 FSWs participated in this study. Participants were interviewed using a semi-structured interview guide. The interviews were audio-taped, transcribed and analysed thematically. Five themes emerged from the interviews revealing an overall poor physical, mental, and sexual/reproductive health status owing to different factors including lack of healthcare knowledge, and difficulty in accessing quality healthcare services among the participants. The study identifies the need for urgent attention to the socially vulnerable FSWs in Bangladesh through specialized healthcare services and promotion of social awareness.

The findings mentioned above are part of a mixed-methods approach with concurrent data collection, and the presentation includes preliminary findings from the qualitative data collection only. The study was funded by the University of New England (UNE), Australia and the first author is a recipient of an RTP scholarship from the Australian Commonwealth Government. The authors obtained ethical clearance from the Human Research Ethics Committee at UNE to conduct this study. The study focuses on 'Better health', a thematic priority set by the University of New England, and contributes towards the sustainable healthcare services for marginalized communities through an empirical research approach which is a key priority of the Research Pathways Conference.

Keywords*:* Female sex workers (FSWs), Healthcare, Barriers, Bangladesh

From Struggle to Strength: How Peer Support can be a key to community resilience during a crisis

Darren Wagner

PhD | School of Rural Medicine

Biography

Darren is a Post Traumatic Growth (PTG) advocate, lived experience researcher and a former peer support worker and police officer with a lived experience of complex Post Traumatic Stress Disorder (PTSD) and suicide attempt survivor with extensive experience working with mass trauma after supporting his community of Sandy Hook, United States through a school shooting. He is passionate about recovery and resiliency for individuals and communities. Darren is working on a PhD with Manna Institute to explore the role of peer workers and how this emerging workforce might be expanded and made more sustainable in rural and regional communities to augment current and future mental health teams.

Abstract

Over the past few years rural communities have had to contend with bushfires, floods, and the COVID-19 pandemic. These natural disasters cause loss, grief, and stress and have added to mental health challenges being faced by many individuals in rural communities. A study by Zhang et al., (2022) found that those who faced mental health challenges and concerns after the bushfire occurrence would go on to develop long-term mental health issues.

The ability of a community to respond to, withstand, and recover from adverse circumstances is known as community resilience. There are several variables that are needed to build resilience in a community including local leadership, resource accessibility and social cohesiveness.

Peer support workers build authentic mutual connections and build rapport with people by inspiring hope and role-modelling recovery. Peer support workers can address social cohesiveness by offering their skills and knowledge gained through their own struggles with stress, trauma, and isolation. Peer support workers can help people cope with these challenges by providing emotional, social, and practical support in times of crisis.

My research aims to identify the current rural peer support workforce's job experiences and what additional organisational readiness, training and supports could be needed to develop a sustainable professional rural peer workforce for the future inevitable crisis's that will be faced by rural, regional, and remote (RRR) communities in Australia.

References

Zhang, Y., Workman, A., Russell, M. A., Williamson, M., Pan, H., & Reifels, L. (2022). The long-term impact of bushfires on the mental health of Australians: A systematic review and meta- analysis. *European Journal of Psychotraumatology*, *13*(1), 9. https://doi.org/10.1080/20008198.2022.2087980

Session Four

Oorala (E022)

Theme:
Soil, Pasture, Beetles

Density affects brood ball production in small monospecies groups of dung beetles

Zinat Jahan Chowdhury,

PhD | School of Environmental & Rural Science

Biography

Mrs Zinat Jahan Chowdhury is a PhD candidate at UNE in the insect ecology lab. Her project focuses on inter- and intra-specific competition of dung beetles. She completed her Bachelor in Agriculture and MSc. in Entomology from Bangladesh. She did her second Master's degree in Tropical Biodiversity and Ecosystems from Vrije Universiteit Brussels, Belgium.

Abstract

The limitation of resources due to increasing density is one of the reasons for competition in dung beetle communities. This competitive interaction results in reduced survival, growth, and brood ball production of individuals. Dung beetles are important ecosystem engineers as they feed and bury dung, help to control parasites, nematodes and flies, and promote soil aeration, nutrient cycling and seed dispersal. Therefore, predicting how density provokes the competition of dung beetles resulting in reproduction is crucial for ecosystem conservation. This study quantified the intraspecific competition of dung beetles via brood ball production of two paracoprid species: *Onthophagus binodis* and *Digonthophagus gazella*. It investigated the dung beetle brood ball production under six different densities: D1 (1 female beetle - control), D2 (1 female, 1 male), D3 (2 female, 1 male), D4 (2 female, 2 male), D5 (3 female, 2 male), and D6 (3 female, 3 male) kept at a constant 25℃ and 40% relative humidity. *Onthophagus binodis* produced over three times more (p = 0.004) brood balls in D3 (21.4) and D5 (17.4) compared to the control (5.6), whilst D2, D4 and D6 produced double the number of brood balls (p > 0.05) with a mean number of 12.0 compared to the control. In the case of *Digonthophagus gazella,* D4 (10.2) and D5 (11.0) produced five times more (p = 0.008) brood balls in relation to the control (2.3). In addition, the comparative analysis between species showed that brood ball production was 77% higher (p < 0.001) in *O. binodis* than *O. gazella* with a mean value of 7.6. The study concluded that high densities produced more brood balls for both dung beetle species in terms of reproduction.

Keywords: competition, Digonthophagus gazella, Onthophagus binodis, reproduction

Investigating the impact of nutrient stoichiometry on carbon sequestration in dispersive subsoils

Andrew Regan

PhD | School of Environmental & Rural Science

Biography

Andrew began his PhD in 2019 while working as an agronomist. He is currently working on similar projects as a research scientist at CSIRO.

Abstract

Sequestering carbon in agricultural soils improves productivity and contributes to offsetting greenhouse gas emissions (Lal, 2011). The balanced application of N, P and S in combination with stubble incorporation into topsoil is a novel strategy to improve soil organic matter (SOM) retention in cropping systems (Kirkby et al., 2016; Kirkegaard, 2023). The current study aims to build on previous research by exploring this input strategy in a dispersive subsoil. Dispersive subsoils benefit from the application of organic matter (Uddin, et al., 2022) so it is possible that dispersion could be further reduced by the co-application of nutrients.

The study comprised of an incubation experiment to assess if the stubble and nutrient treatments caused an increase in OM turnover in a dispersive subsoil. Follow-up testing was conducted on the incubated samples to measure changes in total organic C (TOC) and the major pools of soil C based on particle size fractionation (Mineral-associated organic C (MAOC). Particulate OC (POC). and Recalcitrant OC (ROC)). A second incubation experiment was conducted to analyse changes to soil stability based on spontaneous turbidity, mechanical turbidity and zeta potential.

The application of stubble and a high N fertiliser rate (compared to No or Low N) caused an increase in OM turnover, which was evidenced by changes in CO_2 respiration. The effect of additional S and P on OM turnover was inconclusive, but respiration was periodically higher under the N (+S+P) compared to the other treatments with added stubble. The CO_2 respiration effects were partially reflected in post-incubation soil testing of total carbon and carbon fractions. TOC, MAOC, POC and ROC increased with the application of stubble. The C fractions trended higher when applied with higher N rate, while soil C fractions were not affected by additional S and P treatments.
The application of stubble improved aggregate stability when applied without fertiliser, but there was no main effect of stubble when averaged across all fertiliser treatments. Nitrogen rate significantly improved aggregate stability, and this treatment effect was evident in the No Stubble (control) and Stubble average treatment groups, suggesting N rate was more important than stubble treatment. There was no significant impact of additional S and P on aggregate stability. Stubble caused an improvement in spontaneous turbidity whereas N rate caused an improvement in mechanical turbidity which suggests additional N fertiliser can increase the effectiveness of incorporated stubble.

In conclusion, evidence from this study suggests paying attention to the carbon-nutrient balance has potential to increase soil C stabilisation and aggregate stability in a dispersive subsoil, consistent with previous studies in cropped topsoils. Stubble and nitrogen rate were the main drivers of microbial activity in the soil used and further testing is required to determine if the increases in soil respiration originated from native SOM or added C from stubble.

There was an increase in initial microbial respiration as a result of additional S and P but this did not translate to increased soil C or aggregate stability. Further research is required to understand the circumstances in which S and/or P fertilisation provides additional benefit (e.g. S/P deficient soils). Overall, the potential to improve the structure and function of a dispersive subsoil using crop residue incorporation with supplemental nutrients may provide both nutritional and soils structural benefits to improve the water dynamics and crop growth on troublesome dispersive soils.

References

Kirkby, C.A., Richardson, A.E., Wade, L.J., Conyers, M., & Kirkegaard, J.A. (2016), 'Inorganic Nutrients Increase Humification Efficiency and C-Sequestration in an Annually Cropped Soil', PLoS One, 11(5), https://doi.org/10.1371/journal.pone.0153698Kirkegaard, 2020).

Kirkegaard, J.A, Richardson, A.E., and Kirkby, C.A. (2023), 'Fate and Cost Effectiveness of Soil Carbon Sequestered Using Supplementary Nutrients Applied to Crop Residues Under Field Conditions', Nutrient cycling in agroecosystems 143

Lal, R. (2011), 'Sequestering carbon in soils of agro-ecosystems', Food policy, Vol.36 (1), p.S33-S39
Uddin, Shihab et al. (2022), 'Ameliorating Alkaline Dispersive Subsoils with Organic Amendments: Are Productivity Responses Due to Nutrition or Improved Soil Structure?', Plant and soil 227

Building resilient pasture systems: effects of paddock tree microclimate on pasture physiology and biomass production

Abigail Addo-Danso

PhD | School of Environmental and Rural Science

Biography

Abigail Addo-Danso is a PhD candidate at the University of New England. Before her PhD studies, Abigail received two separate Master's degrees in Land Management and Forestry from Cranfield University, United Kingdom and University of British Columbia, Canada, respectively. She holds a Bachelor's degree in Natural Resources Management from Kwame Nkrumah University of Science and Technology, Ghana. She is committed to enhancing knowledge and understanding into agroforestry systems. Her past research works have centred on integrating bamboo into food cropping systems and identifying incentives to encourage the development of bamboo plantations. Currently her research interests are in paddock trees and the physiology of pasture species.

Abstract

Grasslands contribute almost $21 trillion to the global economy but their productivity may be reduced with models predicting rise in land-surface temperature of 1.5–3 °C. The landscape of the Northern Tablelands region of New South Wales is predominantly grasslands with trees occurring in scattered, clustered or strip-planted arrangements. These trees provide several benefits, including microclimatic effects on understory pasture performance. Tree microclimatic effects have the potential to bring positive impacts to agricultural systems, but are under-studied due to complex interactions. To explore this, we evaluated paddock tree microclimatic effects on the physiology and growth of pasture species. Thermal tolerance limit (photosynthetic heat tolerance), vulnerability to heat damage (thermal safety margin), traits (rate of photosynthesis, specific leaf area and leaf tissue nitrogen), biomass production and surface soil conditions of understory and open field pasture species were quantified. Preliminary results suggest that impacts of paddock tree microclimate effect are seen in pasture biomass production and surface soil conditions rather than in the physiology and growth of pasture species. Aboveground and belowground plant biomass, and soil properties (organic matter, nitrogen and carbon contents) were significantly higher for understory conditions than in the open field conditions. However, plant biochemical and physiological traits including leaf nitrogen did not differ between understory and open field pasture species, implying trait expression in occurring pasture species may not be influenced by environmental changes. These results highlight the potential importance of paddock trees within tree-pasture systems and provide enhanced understanding of the physiology and growth of occurring pasture species.

References

Coast, O., Posch, B. C., Rognoni, B. G., Bramley, H., Gaju, O., Mackenzie, J., Pickles, C., Kelly, A. M., Lu, M., Ruan, Y. L., Trethowan, R., & Atkin, O. K. (2022). Wheat photosystem II heat tolerance: Evidence for genotype-by-environment interactions. *The Plant Journal, 111*(5), 1368-1382. https://doi.org/10.1111/tpj.15894

Farfan-Vignolo, E. R., & Asard, H. (2012). Effect of elevated CO_2 and temperature on the oxidative stress response to drought in *Lolium perenne* L. and *Medicago sativa* L. *Plant Physiology and Biochemistry, 59*, 55-62. https://doi.org/10.1016/j.plaphy.2012.06.014

Ismangil, D., Wiegant, D., Hagos, E., van Steenbergen, F., Kool, M., Sambalino, F., Castelli, G., Bresci, E. & Hagos, F. (2016). *Managing the microcliamte* (Practical Note #27). https://floodbased.org/

Liu, H., Hou, L., Kang, N., Nan, Z., & Huang, J. (2022). The economic value of grassland ecosystem services: A global meta-analysis. *Grassland Research, 1*(1), 63-74. https://doi.org/10.1002/glr2.12012

Posch, B. C., Hammer, J., Atkin, O. K., Bramley, H., Ruan, Y.-L., Trethowan, R., & Coast, O. (2022). Wheat photosystem II heat tolerance responds dynamically to short-and long-term warming. *Journal of experimental botany, 73*(10), 3268-3282. https://doi.org/https://doi.org/10.1093/jxb/erac039

Reid, N. (undated). *Case study A: Northern Tablelands of New South Wales*. University of New England. Retrieved June 16 2022 from https://www.woolwise.com/wp-content/uploads/2017/07/RSNR-403-503-08-T-18.pdf

Session Four

Arts (E011), A2

Theme:
Life Writing/Writing Life

Cooking with the Word of Wisdom

Sherrie Gavin

PhD | School of Humanities, Arts & Social Sciences

Biography

Sherrie Gavin completed her undergraduate degree in history at Southern Utah University, shortly before moving to Australia. She began informal study in food and food history, which soon developed into a passion. She is published in the Journal of Mormon History, The Exponent II (feminist periodical and blog), and has a forthcoming memoir published by By Common Consent Press.

Abstract

One of the primary social identifying factors of practicing Mormons is the abstinence of coffee, tea, and alcohol (D&C: 89). Often cited as the classic 'Word of Wisdom' revelation of 1833, found in the 89th section of the *Doctrine and Covenants*, the consumption prohibition of these items was not implemented until a worthiness policy change 1921 that came into alignment with the temperance movement. Mormon alcohol production with the primary assumption of alcohol as a beverage that is occasionally used medicinally has previously been analysed by Thomas G. Alexander, Dennis R. Lancaster and Del Vance. However, the use of these products in culinary applications, which historically would have been primarily as executed by women, has yet to be examined. This paper uses an ethnographical framework to discuss the historical culinary adaptations found in cookbooks, recipe collections, and periodicals of Mormon women regarding the hard-line forbiddance of alcohol, tea, and coffee, and how Mormon women were resilient in maintaining cultural culinary expectations, yet were innovative in creating a new kind of Mormon Cookery between the 1921 policy change and the Second World War.

References

Alexander, Thomas. 'The Word of Wisdom: From Principle to Requirement', *Dialogue: A Journal of Mormon Thought* (1981) 14 (3): 78–88

Doctrine and Covenants, section 89 (1833 revelation)

Lancaster, Dennis R. (1972) 'Dixie Wine', (unpublished Master's thesis) Brigham Young University.

Vance, Del. *Beer In The Beehive*, Dream Garden Press, 2008.

The Relief Society Magazine (between 1921 and 1940)

The Young Women's Journal (between 1921 and 1940)

Innovative biography: Writing a life from multiple perspectives

Elizabeth Chappell

PhD | School of Humanities, Arts & Social Sciences

Biography

Elizabeth Chappell is a PhD (Creative Practice) candidate at the University of New England, Armidale. Her doctoral project reimagines the life of early Australian feminist and political activist, Catherine Helen Spence. Elizabeth holds a BA (Communication) from the University of Technology, Sydney; a MA (Writing) from the University of New England and has had a long career in journalism, working for women's magazines and regional newspapers. She is the author of *Celebrate the Seasons: Garden Memoirs of New England* and a regular contributor to Australian Garden History Journal. Her scholarly articles have been published in TEXT Journal and Baptist Quarterly.

Abstract

Readers expect biography to be true and accurate. Yet individual recollections and interpretations can differ, memory is selective and imperfect. Telling a life story involves choices of which version of the 'truth' to include, how to imagine across lacunae in the archival record. This paper explores whether it possible to write a past life from multiple and sometimes conflicting points of view. My creative biography of early Australian feminist, Catherine Helen Spence, develops a technique for recovering her life from the perspectives of those who interacted with her. My presentation explains how this technique challenges established biographical practice. I am drawing on the work of John Paul Eakin (2019), who argued that any biographical work inevitably involves 'relational others' in the subject's life. I use the voices of 'relational others' in Spence's life to tell her story – like a series of imagined interviews. Challenges to the demarcation between fiction and non-fiction come from both the history and literary academies. Post-modern historiography, prompted by the work of Hayden White (1966), is in accord with narrative theories of 'truth value' or a continuum between fact and fiction, explicated by literary theorists such as John Keener (2001), Julia Novak (2017) and Donna Lee Brien (2022). My creative biography of Catherine Helen Spence demonstrates how multiple narrators can recover a life from the past with both integrity and creativity. Does this make my work a novel? Perhaps, but more importantly it provides an innovative framework for biographical interpretation.

References

Brien, Donna Lee and Kiera Lindsey. 2022. *Speculative Biography: Experiments, Opportunities and Provocations*. *Routledge Auto/Biography Studies*. Milton: Taylor and Francis.

Keener, John F. 2001. *Biography and the Post-modern Historical Novel*. Vol. 3. New York: Edwin Mellen Press.

Novak, Julia. 2017a. 'Experiments in Life-Writing: Introduction', In *Experiments in Life-Writing*, 1-36.

White, Hayden 1966. 'The Burden of History'. *History and Theory* 5 (2): 111-134. http://www.jstor.org/stable/2504510

Campus as a site of (trans)formation: Rhetorics of place and resilience in Australian campus novels set in Sydney

Chloé Steward

PhD | School of Humanities, Arts & Social Sciences

Biography

Chloé Steward is a first-year PhD Candidate in Writing studies at UNE. She graduated with First Class Honours for her research into the rhetorical dimensions of Miles Franklin Literary Award acceptance speeches from 2019-2022. Her current research explores rhetorics of place in Australian campus novels. Chloé's work contributes to a growing national and international field of scholarship examining the rhetorical dimensions of written and spoken communication.

Abstract

Campus novels are those where events occur primarily on a university campus, and the campus setting gives meaning to the narrative. A recognisable Australian example is Diana Reid's 2021 debut, *Love & Virtue*, a national bestseller which has won numerous awards, including the 2022 ABIA Book of the Year, and has sold rights overseas. Research has found that campus novels attract a broad readership because the university experience is a rite of passage, and the campus is a site of formation and transformation for individuals and communities. However, that research has largely been based on campus novels set in countries other than Australia, and it has not yet examined campus novels as rhetorical texts in which the campus, as a setting, promotes ideas about university life and higher education. This paper addresses that gap in research and contributes to a larger project investigating rhetorics of place in Australian campus novels. It identifies a recurring setting in contemporary Australian campus novels – the fictionalised campus in Sydney – and examines the rhetorical function of that setting. It conducts a comparative rhetorical critique of Diana Reid's *Love & Virtue* (2021) and John Dale's *The Faculty* (2022), focusing on descriptions of the campus and surrounding environments which interact with the campus. Drawing on rhetorical genre theory and theories of regional rhetorics, the paper demonstrates how the campus setting affects the characters' behaviours and worldviews, and their cultivation of resilience. The findings will make a regional contribution to knowledge by demonstrating that novelistic representations of Sydney campuses are socioculturally significant and reflect contemporary conversations about Australian university culture.

Session Four

Arts (E011), A3

Theme:
Sustainability, Innovation and Nature

Supply Chain Finance: Collaborative Approach to SMEs Sustainability in Emerging Economies – A Case of Ghana

Joseph Quartey

PhD | UNE Business School

Biography

Joseph Quartey is an Accountant by profession; a member of the Association of Chartered Certified Accountants (ACCA UK) and the Institute of Chartered Accountants Ghana (ICA-Ghana). Joseph holds a Master of Science degree from Coventry University, UK. He has over 15 years of industry experience in the Marketing of Cocoa, and Financial Accounting and Auditing processes. He is passionate about bringing his industry experience into Academia and contributing to the advancement of knowledge through teaching and research. His research focus is on Supply Chain Financing for SMEs in Emerging Economies.

Abstract

Small and Medium Enterprises (SMEs) find it extremely difficult to obtain working capital finance from sustainable financing sources (Quartey et al., 2017). The cause for this longstanding problem is very complex (Dwyer & Kotey, 2015) and has been identified to be more prevalent in emerging economies (Hernandez et al., 2022). The adoption and implementation of Supply Chain Finance (SCF) have been acknowledged to perpetually assist in resolving the financing deficit in the sector (Mussmann, 2015).

The proposed study therefore considers the transition of SMEs' focus from the prevailing Conventional Sources of Finance (CSF) which are associated with agency problems (De Massis et al., 2018; Ni et al., 2017) into the adoption of more promising financing sources that offer more trust-based and inclusive financing mechanisms (Ghofrani, 2021; Liu, 2020).

Numerous studies have emerged in recent years to promote SCF as an alternative innovative source of finance for SMEs. However, research into the factors that drive the adoption, and implementation of SCF and the examination of the inter-relationships between SCF and the performance of SMEs have been identified as scant in the existing literature (Gelsomino et al., 2016; Song et al., 2023).

The study evaluates the preparedness of SMEs in Ghana to embrace SCF and further assess the degree to which SCF impacts the performance of SMEs in Ghana. A mixed research method involving both qualitative and quantitative approaches is adopted for the study, using the NVivo 12 software for the qualitative analysis and the Partial Least Square – Structural Equation Model (SmartPLS) tool for the quantitative analysis.

Although the originality of the study will be mainly its practical outcomes, some scientific contributions are anticipated. The findings and conclusions from the study will influence policy decisions on financing among SME owners, Financial Institutions, and SCF practitioners and will provide significant contributions to the literature on SCF for SMEs.

References

De Massis, A., Kotlar, J., Mazzola, P., Minola, T., & Sciascia, S. (2018). Conflicting selves: Family owners' multiple goals and self-control agency problems in private firms. *Entrepreneurship theory and practice*, *42*(3), 362-389. https://doi.org//10.1111/etap.12257

Dwyer, B., & Kotey, B. (2015). Financing SME Growth: The role of the national stock exchange of Australia and business advisors. *Australian accounting review*, *25*(2), 114-123. https://doi.org//10.1111/auar.12074

Gelsomino, L. M., Mangiaracina, R., Perego, A., & Tumino, A. (2016). Supply chain finance: a literature review. *International Journal of Physical Distribution & Logistics Management*.

Ghofrani, H. (2021). Supply Chain Finance: Techniques, Benefits, and Trends.

Hernandez, S., Alvarez, T., Roscigno, R., & Piluso, V. (2022). Working Capital Management and Profitability: Empirical Evidence from an Emergent Economy. *International Journal of Business Management & Economic Research*, *13*(1).

Liu, Z. (2020). Literature review of supply chain finance based on blockchain perspective. *Open Journal of Business and Management*, *9*(1), 419-429. https://doi.org/10.4236/ojbm.2021.91022

Mussmann, C. (2015). *Supply chain finance: improving the efficiency of the table grape industry: a case study* Stellenbosch: Stellenbosch University].

Ni, J., Chu, L. K., & Li, Q. (2017). Capacity decisions with debt financing: The effects of agency problem. *European Journal of Operational Research*, *261*(3), 1158-1169. https://doi.org//10.1016/j.ejor.2017.02.042

Quartey, P., Turkson, E., Abor, J., & Iddrisu, A. (2017). Financing the growth of SMEs in Africa: what are the constraints to SME financing within ECOWAS? Review of Development Finance, 7 (1), 18–28. In.

Song, H., Han, S., Liu, W., & Ganguly, A. (2023). What role do FinTech companies play in supply chain finance? A signaling intermediary perspective. *Journal of Business & Industrial Marketing*, *38*(6), 1279-1294.

Resilience and Innovation in NSW Regional Founders seeking Entrepreneurial Finance

Zia Knorles

PhD | UNE Business School

Biography

Zia is a Chartered Accountant and has been working in public practice since completing her Bachelor's degree at UNE. She is currently a full-time scholarship-funded HDR student after having successfully upgraded her MPhil to a PhD. Her dissertation title is 'Enablers and Barriers to Entrepreneurial Finance for NSW regional Founders: A Thematic Analysis of their Approaches and Views'. This presentation takes the opportunity to explore the conference themes of innovation and resilience in relation to a cohort of regional founders' experiences in accessing entrepreneurial finance.

Abstract

Founders of innovative businesses have difficulty accessing the financial capital needed to grow their venture (Cumming et al. 2019; Wilson et al. 2018) and those in regional locations face unique difficulties due to their distance from resources (Mason, 2010). However, there is limited research or literature on how regional founders approach and experience entrepreneurial finance.

This conference presentation explores this issue via the seminar themes of 'Innovation' and 'Resilience' by asking: In what ways are NENW regional founders innovative and/or resilient when seeking Entrepreneurial Finance?

Thematic analysis is performed on semi-structured interviews conducted with 20 NENW founders under ethics approval HE22-072, obtained for the scholarship-funded PhD dissertation entitled 'Enablers and Barriers to Entrepreneurial Finance for NSW regional Founders: A Thematic Analysis of their Approaches and Views'.

Entrepreneurial Finance is important because without cashflow and capital a start-up or scale-up has no chance to succeed and contribute to its regional community via employment, goods/services and consumption. However, when attempting to obtain entrepreneurial finance, persistence as an expression of resilience is not sufficient without adjustment to, and perhaps innovation in, techniques and approaches used. Therefore, non-financial assistance may also be required in order to obtain both finance and broader success. Findings will revel to what extent this may be the case in relation to a cohort of local founders' experiences in accessing entrepreneurial finance. By doing so this project offers a significant contribution to NENW founders, to the UNE's SMART Region incubator, and our wider regional community via flow-on effects.

References

Colin Mason (2010) Entrepreneurial finance in a regional economy. *Venture Capital, 12:3,* 167-172, https://doi.org /10.1080/13691066.2010.507033

Cumming, D., Deloof, M., Manigart, S., & Wright, M. (2019). New directions in entrepreneurial finance. *Journal of Banking & Finance*, *100*, 252-260. https://doi.org/10.1016/j.jbankfin.2019.02.008

Wilson, N., Wright, M., & Kacer, M. (2018). The equity gap and knowledge-based firms. *Journal of Corporate Finance*, *50*, 626-649. https://doi.org/10.1016/j.jcorpfin.2017.12.008

Phylogenomic analysis of the generic limits of *Chrysocephalum*

Shelley Rowntree

PhD | School of Environmental and Rural Science

Biography

Shelley Rowntree is in the first year of a PhD in Systematic Botany focussing on the systematics of *Chrysocephalum (Asteraceae)* after completing BSc in Plant Science and Honours (First Class; University Medal) at UNE, studying the systematics of *Lepidosperma (Cyperaceae)*. Shelley left a career in IT behind to pursue her passion, combining a deep love of nature with an inner nerdy love of mathematics and data.

Abstract

In the face of rapid environmental change and an extinction crisis, there has never been a more important time to understand our biodiversity. As taxonomists, we build a commonly understood structure – family, tribe, genus, species - that allows advocates, policymakers, researchers and land managers to speak a common language in conversations about biodiversity.

Chrysocephalum is a medium-sized genus of small paper daises, occurring across all states in Australia. The taxonomic history of the genus is complex, and the genus and species have never been tested with molecular or morphological analyses. Evolutionary trees (phylogenies) are a fundamental tool to help make sense of biological diversity by depicting lines of evolutionary descent of different species. Because limits of *Chrysocephalum* are doubtful, the first step in this project is a phylogenetic analysis. Using cutting-edge high-throughput sequencing, this study investigated the generic limits of *Chrysocephalum* in the context of related genera, testing the hypothesis that *Chrysocephalum* is not a natural group.

The results of this analysis contribute directly to the documentation of Australian biodiversity and the tools to help us understand and conserve it.

Session Five

Oorala (E022)

Theme:
Adaptation and Change

Liver transcriptomic profile responses to dietary protein and energy levels in broiler chickens

Collins Amponsah Asiamah

PhD | School of Environmental and Rural Sciences

Biography

Collins Asiamah is a Ghanaian PhD student at the School of Environmental and Rural Sciences, University of New England. He earned his Bachelor's degree in Agricultural Technology in Ghana and subsequently completed his Master's degree in Animals Genetics, Breeding, and Reproduction in China. His research interest focuses on nutritional factors in poultry production, genetics and bioinformatics. Aside from work, playing football is his hobby.

Abstract

Many studies have evaluated the effects of different levels of protein and energy on the performance of broiler chickens aiming to enhance feed efficiency and minimising environmental impact. However, the molecular mechanism underlying the differences in the growth performance in response to these dietary levels has been less explored. Therefore, this study aimed to uncover differentially expressed genes (DEGs) and regulatory networks that affect the growth performance of birds. A growth performance experiment was conducted to investigate the liver transcriptome response of Cobb 500 broiler chicks fed different levels of protein and energy. Two dietary treatments, normal protein normal energy (NPNE; 18% and 10.4MJ/kg) and low protein low energy (LPLE; 16% and 9.9MJ/kg) diets were offered to birds during the finisher stage (day 19-35). Results from this study showed that birds fed the NPNE diet had significantly ($P<0.05$) higher body weight, higher feed intake and lower feed conversion than the birds fed LPLE diets. Liver transcriptome profile identified 561 DEGs (absolute fold change >1 and false discovery rate <0.05). Among these DEGs, 237 were upregulated and 324 were downregulated in the NPNE compared to LPLE groups. The top five (5) DEGs were *MMRN1*, *SNCA*, *KCNK16*, *SLC7A11*, and *LRRC9*. The Gene Ontology and Kyoto Encyclopedia of Genes and Genomes functional enrichment analysis showed that DEGs were associated with xenobiotic metabolic process, cellular response to glucose starvation, muscle cell development, metabolic pathways, biosynthesis of amino acids, and glutathione metabolism. This study enhances the understanding of the molecular mechanism underlying growth performance in response to protein and energy levels in broiler chickens. Furthermore, these DEGs can be used as candidate genes to further investigate the mechanisms underlying broiler growth in response to dietary nutrients for better feed efficiency and profitability.

Keywords: protein, energy, differentially expressed genes, transcriptome

References

Hu X, Li X, Xiao C, Kong L, Zhu Q, Song Z. Effects of Dietary Energy Level on Performance, Plasma Parameters, and Central AMPK Levels in Stressed Broilers. Front Vet Sci. 2021 May 28;8:681858. doi: 10.3389/fvets.2021.681858. PMID: 34124230; PMCID: PMC8192699

Saleh, A.A.; Amber, K.A.; Soliman,M.M.; Soliman,M.Y.; Morsy,W.A.; Shukry,M.; Alzawqari, M.H. Effect of Low Protein Diets with Amino Acids Supplementation on Growth Performance, Carcass Traits, Blood Parameters and Muscle Amino Acids Profile in Broiler Chickens under High Ambient Temperature. Agriculture **2021**, 11, 185. https://doi.org/10.3390/agriculture11020185 .

Shao M, Shi K, Zhao Q, Duan Y, Shen Y, Tian J, He K, Li D, Yu M, Lu Y, et al. Transcriptome Analysis Reveals the Differentially Expressed Genes Associated with Growth in Guangxi Partridge Chickens. *Genes*. 2022; 13(5):798. https://doi.org/10.3390/genes13050798.

Why do warm nights reduce wheat yield?

Pratima Rana Shahi

PhD | School of Environmental & Rural Science

Biography

Pratima is a second year PhD student. Originally from Nepal, she holds two Masters degrees. One in Biodiversity Science from UNE Australia (2020) and the other in Botany from Kumaun University, India (2014). Pratima has a strong background in environmental and ecological science. She has worked on species structure, biomass, and carbon sequestration in Cypress mixed oak forests of the Central Himalaya in India, and herbivore predation in natural and disturbed forest sites in the New England Tablelands. Pratima is currently researching acclimation of fundamental physiological processes (photosynthesis and respiration) to rising night temperatures in wheat.

Abstract

Wheat is a staple crop for about 3 billion people. Demand for wheat is expected to rise as the global population increases. Meeting future demand for wheat will be challenging. More so when global night-warming of 1 °C has been estimated to reduce its yield by 6-9%. We undertook experiments to determine why warm nights induce wheat yield loss. We subjected plants of 10 Australian wheat cultivars, bred between 1901 and 2012, were to control (12 °C) and warm (22 °C) nights for 3-4 weeks at flowering. Warm nights increased daytime respiration (CO_2 release) and photosynthesis (CO_2 fixation) but decreased night-time respiration. These changes were more pronounced in older wheat cultivars (e.g Federation, bred in 1901) than in modern cultivars (e.g. Merinda, bred in 2007). Modern Australian wheat cultivars demonstrated a remarkable ability to use respiration to maintain their energy balance, and enhance their capacity to minimize the effects of night warmings. Combined, our results suggest that failure or limited capacity to positively adjust photosynthetic and respiratory processes to warm nights causes reductions in the carbon and energy economy of wheat which ultimately results in lower yields. However, differences between the old and new cultivars provides opportunities for breeding wheat cultivars that are tolerant of warm nights. This work will contribute to global efforts aimed are achieving food security for a growing population by increasing crop yields using sustainable and innovative practices.

This work was funded through an UNE IPRA scholarship and Thomas Davies Award from the Australian Academy of Science.

References

Asseng, S., Foster, I., & Turner, N. C. (2011). The impact of temperature variability on wheat yields. *Global Change Biology, 17*(2), 997-1012.

Lobell, D. B., & Ortiz-Monasterio, J. I. (2007). Impacts of day versus night temperatures on spring wheat yields: a comparison of empirical and CERES model predictions in three locations. *Agronomy Journal, 99*(2), 469-477.

Posch, B. C., Kariyawasam, B. C., Bramley, H., Coast, O., Richards, R. A., Reynolds, M. P., Atkin, O. K. (2019). Exploring high temperature responses of photosynthesis and respiration to improve heat tolerance in wheat. *Journal of Experimental Botany, 70*(19), 5051-5069.

Prasad, P. V. V., Pisipati, S. R., Ristic, Z., Bukovnik, U. R. S. K. A., & Fritz, A. K. (2008). Impact of nighttime temperature on physiology and growth of spring wheat. *Crop Science, 48*(6), 2372-238

Session Five

Arts (E011), A2

Theme:
Education

English Speaking Anxiety among English as a Second Language Learners at State Universities in Sri Lanka

Iromi Weerakoon

PhD | School of Education

Biography

Iromi Weerakoon is a Senior Lecturer in English at Sabaragamuwa University of Sri Lanka. Currently, she is pursuing her PhD studies at the University of New England, Australia. Her research interests include language anxiety, motivation, and positive psychology.

Abstract

From the most widely studied research topics in the field of second language acquisition (SLA), language anxiety (LA) has been enjoying unceasing popularity over four decades due to its pervasiveness in the language learning domain and its intensity as an emotion. Despite its detrimental effects on English as a Second Language (ESL) learners in tertiary education settings in Sri Lanka, the role of LA and its sources have been significantly overlooked in the Sri Lankan context. Moreover, due to the unique socio-cultural dynamics in Sri Lankan classrooms related to speaking English, the sources of LA investigated in classrooms of other contexts cannot be generalised to that of the Sri Lankan context. Hence, recognising the need for a careful investigation into the LA sources unique to ESL classrooms in Sri Lanka, this study explored the classroom-related factors that cause ESL learners to experience LA while speaking English at Sri Lankan state universities. Data was collected from ESL teachers and learners using four research methods: questionnaire, in-depth interviews, focus groups and ESL classroom observations. The study identified five in-class sources that contribute to ESL learners' LA: (i) in-class social context, (ii) ESL teacher, (iii) in-class speaking practice activities, (iv) physical structure of the classroom, and (v) test anxiety. The findings presented have significant implications for ESL teachers, policymakers and curriculum planners in their attempts to manage the LA of ESL learners at state universities in Sri Lanka.

References

Gkonou, C., Daubney, M., & Dewaele, J. M. (2017). Introduction. In C. Gkonou, M. Daubney, & J. M. Dewaele (Eds.), *New insights into language anxiety: Theory, Research and educational implications*. Bristol: Multilingual matters.

Gregersen, T. S., MacIntyre, P. D., & Meza, M. D. (2014). The motion of emotion: Idiodynamic case studies of learners' Foreign Language Anxiety. *The Modern Language Journal, 98*(2), 574-588.

MacIntyre, P. D. (2017). An overview of language anxiety research and trends in its development. In C. Gkonou, M. Daubney, & J. M. Dewaele (Eds.), *New insights into language anxiety: Theory, research and educational Implications*. Bristol: Multilingual Matters.

Gross National Happiness (GNH) and GNH Values as Understood by Principals, Teachers and Students of Two Bhutanese Case Study Schools

Kaka

Abstract

Gross National Happiness (GNH) is the developmental philosophy and policy of Bhutan that is intended to enable conditions for people to pursue happiness in sustainable ways. The Educating for Gross National Happiness (EGNH) was initiated by the Ministry of Education to infuse, integrate, and promote GNH values in the school system. However, the EGNH initiative is not a success story as anticipated. A qualitative study based on interviews was undertaken to study how GNH policy and GNH values are understood and practised by principals, teachers, and students of two Bhutanese schools. The study revealed that participants lack a deeper understanding of the philosophical underpinnings of GNH. Participants also do not demonstrate clear and specific pathways for promoting GNH values. The study supports the need to strengthen the EGNH policies and practices to provide teachers and students with a deeper knowledge of the philosophical underpinnings of GNH and practical application at the school and personal levels.

Key words: Gross National Happiness (GNH), Green School, Leximancer, Assertion

Session Five

Arts (E011), A3

Theme:
Science and Technology

3D Printing for Advanced Drug Delivery Systems: A new Approach

Hanny Chua

Masters (coursework) | School of Science and Technology

Biography

Hanny is a graduate Bachelor of Science in Chemistry from the University of the Philippines in the Visayas (2006). She worked in industry (pharmaceutical and paint industry) for 15 years before returning to the academy and choosing to pursue a postgraduate degree here at UNE.

Abstract

The revolutionary impact of 3D printing has been observed in diverse technological domains, notably in the field of healthcare. 3D printing enables personalized drug delivery systems (DDS) with precise geometry, size, medication dose, and release duration/profiles that cater to the specific needs of individual patients. This can be achieved by engineering a range of 3D models with interconnected channel-pore structures and geometries. This liberates healthcare from the limitations of the traditional 'one-size-fits-all' approach.

In particular, 3D printing via photopolymerization has been extensively investigated as a means of creating and advancing personalized DDS, including drug-loaded devices, implants, and scaffolds.

Although this approach has already proven effective and widely used, there is still room for further development. One recent technique that has added new dimensions to existing practices is the use of reversible addition-fragmentation chain transfer (RAFT) polymerization. RAFT-mediated 3D printing can be utilized to produce polymeric scaffolds with customized hierarchical porosities and highly resolved features. These properties enable spatiotemporal control of drug loading and compositions within different layers of the 3D-printed material. Another major advantage of using RAFT in 3D printing is the ability for post-printing modification, capitalizing on the ‘living’ feature of these RAFT-produced materials. Continued research and innovation in this field holds promising potential for optimized drug delivery and improved therapeutic outcomes.

References

Hull, C. W.; Arcadia, C. *United States Patent (19) Hull (54) (75) (73) 21) 22 (51) 52) (58) (56) Apparatus For Production Of Three-Dmensonal Objects By Stereo Thography*.

Xu, X.; Awad, A.; Robles-Martinez, P.; Gaisford, S.; Goyanes, A.; Basit, A. W. Vat Photopolymerization 3D Printing for Advanced Drug Delivery and Medical Device Applications. *Journal of Controlled Release*. Elsevier B.V. January 10, 2021, pp 743–757. https://doi.org/10.1016/j.jconrel.2020.10.008

Bagheri, A.; Jin, J. Photopolymerization in 3D Printing. *ACS Applied Polymer Materials*. American Chemical Society April 12, 2019, pp 593–611. https://doi.org/10.1021/acsapm.8b00165

Bagheri, A.; Asadi-Eydivand, M.; Rosser, A. A.; Fellows, C. M.; Brown, T. C. 3D Printing of Customized Drug Delivery Systems with Controlled Architecture via Reversible Addition-Fragmentation Chain Transfer Polymerization. *Adv Eng Mater* **2022**. https://doi.org/10.1002/adem.202201785

Bagheri, A.; Engel, K. E.; Bainbridge, C. W. A.; Xu, J.; Boyer, C.; Jin, J. 3D Printing of Polymeric Materials Based on Photo-RAFT Polymerization. *Polym Chem* **2020**, *11* (3), 641–647. https://doi.org/10.1039/c9py01419e

Inhibitory activity of *Hericium erinaceus* extracts against some bacterial triggers of multiple sclerosis and selected autoimmune diseases

Jonathan Rosenzweig

Masters (research) | School of Science & Technology

Biography

Jonathan Rosenzweig is a Master of Science candidate in the university of New England. He holds a Bachelor of Science, majoring in Neuroscience, and previously worked in the IT industry in health informatics. He has an interest in mycology and neuroscience and is currently investigating the medicinal effect of the Lion's mane mushroom on Multiple Sclerosis in the Ethno-mycological pharmacology field. The study is examining the various effects of the bio active compounds on aspects contributing to development and pathology of MS. An investigation that could potentially be the first of its kind.

Abstract

Hericium erinaceus (Bull.) Persoon (HE) is a mushroom that is used to treat a variety of medical conditions including Alzheimer's disease (AD), Parkinson's disease (PD) and peripheral nerve injury. However, there is a lack of research into its effects against autoimmune diseases, including MS. This study aims to explore the inhibitory activity of HE extracts against some bacterial triggers of MS and selected autoimmune diseases. Thus, this study aims to be the first to our knowledge to explore the anti-microbial properties of HE extracts on bacteria that have been shown to be triggers for MS development.

Methods

HE extractions using methanol, deionised water, ethyl acetate, hexane and chloroform, were tested for antimicrobial activity against *Acinetobacter baylyi* and *Pseudomonas aeruginosa*, using disc diffusion assays, at concentrations of 24.8, 18.5, 4.2, 5.5 and 5.5 mg/ml respectively, and their MICs were quantified using liquid micro-dilution assays, at concentrations ranging from one quarter to 512^{th} of the extracts.

Results

Methanol, Ethyl acetate and water extracts have shown some antibacterial activity against *P. aeruginosa*, at concentrations of 3.1, 1.25 and 2.3 mg/ml respectively, and against *A. baylyi* at original concentrations. In the disc diffusion assay the greatest specificity was shown by methanol extract of HE on *P. mirabilis,* mean zone of inhibition 11.33 mm, at 24.8 mg/ml. Minimum inhibitory concentrations for water and methanol extracts on P. aeruginosa were 2.3 and 3.1 mg/ml respectively.

Conclusion

The inhibitory activities of the HE extracts against some bacterial triggers of MS, highlights their potential in the prevention and treatment of these diseases. Further studies such as anti-inflammatory assays will confirm the effects of these extracts against other aspects of MS progression.

Defining resilience in sheep from fibre diameter variation of wool.

Erin Smith

PhD | of Environmental and Rural Science

Biography

Erin Smith is currently a second-year PhD candidate. Her thesis is focused on selecting for greater resilience in Australian sheep.

Abstract

The capacity to measure and select livestock that are more resilient to environmental fluctuation is of increasing importance amidst climate change, labour shortages and increasing production demand. Currently, however, there is no consensus on how to quantify resilience, particularly in extensive sheep populations. In this study, we explored the ability to derive resilience indicator traits from fibre diameter variation measured longitudinally (5mm increments) along the wool staple. Fibre diameter varies in relation to the supply of nutrients to the wool follicles and thereby provides a stable archive of the animal's physiological status across the preceding wool growth period. From this fibre diameter variation, ways to detect and characterise an animal's ability to withstand or be minimally affected by its environment were explored. The heritability estimates of these measures were shown to be low to moderate (0.02 to 0.30), indicating that genetic variation exists for fibre diameter variation measured along the wool staple which may be interpreted as a measure of resilience. The inclusion of such measures in sheep breeding programs has the potential to improve the resilience of sheep to environmental challenges, which may have positive implications for sheep enterprise profitability, health and welfare.

Session Six

Oorala (E022)

Theme:
Livestock Breeding

Accounting for dominance effects in genomic selection in a nucleus pig breeding program

M Sharif-Islam

PhD | Animal Genetics and Breeding Unit

Biography

M Sharif-Islam completed his undergraduate degree in Animal Husbandry from Bangladesh Agricultural University, Mymensingh, followed by a 6-months internship in a broiler breeding farm and in the livestock feed mill industry. Then he completed a MS in Animal Science from University of Copenhagen in 2019 where he worked on statistical modelling for feed efficiency in dairy cattle for his MS thesis. He started his PhD at UNE in 2020 on optimising pig breeding programs using genomic selection.

Abstract

Genetic selection in animal breeding programs uses additive genetic models for predicting genetic merit of the selection candidate. However, the phenotypic variance of a trait may also contain non-additive genetic components such as dominance (Tusell et al., 2019). Accounting for both dominance and additive genetic effects when selecting genetically superior animals might achieve more genetic gain than accounting for additive genetic effects only. This study compared the rate of true total genetic gain in pig breeding programs using genomic selection based on either dominance models (accounting for both random additive genetic and dominance effects) and the additive model (accounting for additive genetic effects alone). The two modelling approaches were compared using stochastic simulation of a single trait with a heritability of 0.10 to represent a lowly heritable reproduction trait and a dominance variance of 1, using genomic information in a dam line of pigs. Records were available on females only. The breeding scheme was simulated using ADAM software and variance components and breeding values were estimated using DMUAI and DMU4 module of the DMU package (Pedersen et al., 2009; Madsen et al., 2006). This simulation was replicated 50 times. Results showed that the mean additive genetic and residual variances were 10% and 17% larger with the additive model than those with the dominance model. The additive model overestimated additive genetic and residual variances because they also incorporated the dominance variance. Despite this overestimation, both models achieved similar rates of true total genetic gain because animals were selected based on additive genetic effects. Consequently, the additive model can be used in genomic selection even under the presence of dominance if animals are selected based on additive genetic merit.

References

Tusell L, Gilbert H, Vitezica ZG, Mercat MJ, Legarra A, Larzul C. Dissecting total genetic variance into additive and dominance components of purebred and crossbred pig traits. Animal. 2019;13(11):2429-39.

Pedersen LD, Sorensen AC, Henryon M, Ansari-Mahyari S, Berg P. ADAM: A computer program to simulate selective breeding schemes for animals. Livest Sci. 2009;121(2-3):343-4.

Madsen P, Sorensen P, Su G, Damgaard LH, Thomsen H, Labouriau R. DMU - a package for analysing multivariate mixed models. In: Proceedings of the 8th world congress on genetics applied to livestock production: 13-18 August 2006; Belo Horizonte; 2006.

GWAS-based pathway analysis for birth weight in Angus cattle

Nantapong Kamprasert

PhD | School of Environmental and Rural Science

Biography

Nantapong Kamprasert is from Thailand and has a background in animal science. After college, he was offered a job as an officer, and also had an opportunity to do further study at UNE back in 2017. For the last five years, he worked for the Department of Livestock Development, then as a lecturer. Currently, he is a second-year PhD candidate in Environmental and Rural Science. His thesis aims to examine the use of whole-genome sequence for genomic prediction in livestock.

Abstract

Understanding biological processes in organisms enhances knowledge in life sciences. Biological pathways represent a group of functionally related genes that capture biological processes of traits of interest (White et al., 2019). This study aimed to reveal biological processes underlying birth weight (BW) in Angus cattle. Birth weight records were collected from seedstock herds on animals born between 2013 and 2022. Whole-genome sequence genotypes (WGS) were obtained from a stepwise genotype imputation. A Genome-wide association study (GWAS) on BW was conducted on 58,838 animals with 7,899,466 imputed WGS variants. At the significant P-value threshold of 5×10^{-8}, 6,195 SNP were shown to be associated with BW. These SNP's were located on chromosome 5, 7, 20 and 26. The highest peak was found on chromosome 20 and the most significant SNP was rs42662035, 20:4999299. The lead SNP was a downstream variant in *STC2 gene,* involved in regulating Insulin-like Growth Factor. The GWAS top SNPs were then mapped to genes with the *btaurus_gene_ensembl* database (Cunningham et al., 2021). The gene set was interpreted as its biological pathway with Gene Ontology (GO) analysis using clusterProfiler (Wu et al., 2021). Gene Ontology classification showed that the most represented GO terms were '*primary metabolic process*', '*organic cyclic compound binding*' and '*intracellular anatomical structure*' for biological process, molecular function and, cellular component, respectively. The BW-related variants from GWAS revealed only one biological pathway using GO over-representation analysis. The biological pathway consisted of three main parent terms, and the most significant term was '*regulation of behaviour*'. The pathway was meaningfully associated with growth and metabolic processes; *'developmental growth*, *'muscle structure development*' and '*phosphate metabolic process'*. Genes involved with the pathway's identified were also highly related to BW and included *ADRB1* and *MEF2C*. To conclude, GWAS-based pathway analysis captured genes and the biological pathway's underlying BW in Angus cattle. It also illustrated that GO analysis is useful to improve understanding of the biological processes for traits under selection in livestock breeding programs.

References

Cunningham, F., Allen, J. E., Allen, J., Alvarez-Jarreta, J., Amode, M R., Armean, Irina M., Austine-Orimoloye, O., Azov, Andrey G., Barnes, I., Bennett, R., Berry, A., Bhai, J., Bignell, A., Billis, K., Boddu, S., Brooks, L., Charkhchi, M., Cummins, C., Da Rin Fioretto, L., . . . Flicek, P. (2021). Ensembl 2022. *Nucleic Acids Research*, *50*(D1), D988-D995. https://doi.org/10.1093/nar/gkab1049

White, M. J., Yaspan, B. L., Veatch, O. J., Goddard, P., Risse-Adams, O. S., & Contreras, M. G. (2019). Strategies for Pathway Analysis Using GWAS and WGS Data. *Curr Protoc Hum Genet*, *100*(1), e79. https://doi.org/10.1002/cphg.79

Wu, T., Hu, E., Xu, S., Chen, M., Guo, P., Dai, Z., Feng, T., Zhou, L., Tang, W., Zhan, L., Fu, X., Liu, S., Bo, X., & Yu, G. (2021). clusterProfiler 4.0: A universal enrichment tool for interpreting omics data. *The Innovation*, *2*(3), 100141. https://doi.org/https://doi.org/10.1016/j.xinn.2021.100141

Investigation of Population Structure and Genetic Diversity of Four Australian Beef Cattle Breeds

Zeinab Manzari

PhD | Animal Genetics and Breeding Unit

Biography

Zeinab Manzari is a PhD candidate at the University of New England, AGBU. Her PhD research is focused on identifying key markers and genes to enhance the precision of genomic predictions. These predictions significantly impact commercially important traits in Australian beef cattle breeds.

Abstract

Understanding the population structures and genetic diversity of various beef cattle breeds is essential for targeted improvements in breeding programs. This research analysed the genotypes of four cattle breeds in Australia: taurine (Angus, with 2,521 individuals), indicine (Brahman, with 48,380 individuals), and composite breeds (Brangus, with 8,226 individuals; Santa Gertrudis, with 8,244 individuals). Evaluation focused on the effective population size (Ne) based on linkage disequilibrium, runs of homozygosity (ROH), and Genomic Relationship Matrix-based Principal Component Analysis (PCA). In all breeds, Ne showed a gradual decrease over generations. The Ne was estimated using SNeP software from the 13^{th} generation as follows: 187 for Angus, 308 for Brahman, 236 for Brangus, and 206 for Santa Gertrudis breeds. The average inbreeding based on ROH (FROH), was 0.11 for Angus, 0.058 for Brahman, 0.051 for Brangus, and 0.099 for Santa Gertrudis breeds. The Angus breed had the lowest Ne value, indicating a decline in genetic diversity. This decline is attributed to the intensive use of a limited number of individuals as parents for subsequent generations, a trend confirmed by FROH results. For the PCA, this research used PLINK v2.0 software, and visualization was achieved through the ggplot2 package in R. The PCA effectively divided the breeds into four distinct genetic clusters. Our results provide a detailed view of the genetic backgrounds present in each breed and enhance our understanding of the genetic contributions between purebreds and their respective crossbreeds.

References

Purcell, S., Neale, B., Todd-Brown, K., Thomas, L., Ferreira, M.A., Bender, D., Maller, J., Sklar, P., De Bakker, P.I., Daly, M.J. and Sham, P.C., 2007. PLINK: a tool set for whole-genome association and population-based linkage analyses. *The American journal of human genetics*, *81*(3), pp.559-575.

Barbato, M., Orozco-terWengel, P., Tapio, M. and Bruford, M.W., 2015. SNeP: a tool to estimate trends in recent effective population size trajectories using genome-wide SNP data. *Frontiers in genetics*, *6*, p.109.

Wickham, H., Chang, W. and Wickham, M.H., 2016. Package 'ggplot2'. *Create elegant data visualisations using the grammar of graphics. Version*, *2*(1), pp.1-189.

Session Six

Arts (E011), A2

Theme:
Authors and Attitudes

Saudi registered nurses' perspectives, attitudes, and experiences related to e-learning

Reem Hamdan Z Alfaleh

PhD | School of Health

Biography

Reem Alfaleh is currently immersed in her PhD journey at the University of New England. Having completed her Master of Advanced Nursing from Melbourne University in 2019, she has always been passionate about the depths and intricacies of the nursing field. Originally from Saudi Arabia, she has had the privilege of experiencing and blending diverse educational landscapes. She is honoured to share her knowledge and insights as a lecturer at Aljouf University back home. Her vision is to continuously bridge the gap between global healthcare practices, ensuring that her students and peers benefit from a holistic perspective.

Abstract

Objective: This study sought to investigate the perspectives, attitudes, perceptions, and e-learning experiences of registered nurses (RNs) in Saudi Arabia. In addition, the study aimed to identify the barriers and facilitators of e-learning for continuing education among these nurses.

Method: Using a mixed-methods strategy, the research was conducted in two phases. The quantitative phase involved a survey of 364 RNs from eight hospitals in the Aljouf region of Saudi Arabia. 15 RNs were chosen for semi-structured, phenomenological interviews during the qualitative phase. Using thematic analysis, significant themes from the interviews were extracted.

Preliminary results: Initial data analysis from the quantitative segment is currently ongoing. Three major themes emerged from the qualitative phase, highlighting the diverse perspectives of Saudi RNs on e-learning. Detailed results are still being finalised, but preliminary findings indicate that although many nurses recognise the potential benefits of e-learning, there are notable barriers and facilitators affecting their adoption and effective use of this mode of continuing education.

Conclusions: E-learning as an instrument for continuing education among Saudi RNs presents both opportunities and challenges. Understanding the complexities of these perceptions will be crucial for devising effective e-learning strategies for Saudi Arabia's nursing workforce as healthcare systems around the world increasingly adopt digital methods of professional development.

Keywords: E-learning, continuous education, registered nurses, Saudi Arabia, mixed-methods, phenomenological approach, attitudes, and perceptions.

Have We Been? The Supernatural Child in Stephen King's *The Shining*

Lauren Mirco

Masters (coursework) | School of Humanities, Arts & Social Sciences

Biography

Lauren Mirco is a Master of Arts student at the University of New England, School of Humanities, Arts and Social Sciences. She received a Bachelor's degree in English from Macquarie University. Her current research is on Stephen King's representation of supernatural children in horror novels and how this reflects American culture of the 1970s. She is interested in horror studies, Gothic fiction, and popular culture.

Abstract

As part of a larger project examining Stephen King's representation of supernatural children in his novels, this paper asks what the trope of the supernatural child in horror fiction might tell us about dominant notions of childhood and the family, specifically in the context of 1970s American culture. To this end, the paper argues that King's deployment of the figure of the supernatural child in *The Shining* (1977) is directed to exposing the abusive underside of one of the ideological pillars of American society—the nuclear family. Equipped with extraordinary supernatural abilities, the child protagonist becomes an outsider figure bestowed with the agential power to oppose and change the structures that bind them. King also examines concepts central to the maintenance of patriarchal power: masculinity and the father-son bond, temporality and intergenerational cycles of child abuse. Central to this enquiry is the suggestion that King represents family violence as both familiar (*heimlich*) and deeply troubling and unfamiliar (*unheimlich*): 'that class of frightening which leads back to what is known of old and long familiar' (Freud, 'The Uncanny'). Child abuse, therefore, is shown to be uncanny, that is to say, commonplace, yet estranging and destructive of familial and society structures, which are shown in the novel to be not only dangerous, but also deadly.

References

Freud, Sigmund. 'The Uncanny'. *The Monster Theory Reader,* edited by Jeffrey Andrew Weinstock, University of Minnesota Press, 2020, pp. 59-88.

King, Stephen. *The Shining.* Chancellor Press, 1992.

Sudden Revelations and Inconclusive Experiences: Apocalyptic resonances in Conrad

Samuel Commerford

PhD | School of Humanities, Arts & Social Sciences

Biography

Samuel Commerford (BA, MTeach) is a devoted student and teacher of English literature. Since graduating from Western Sydney University, Samuel has taught across the full range of age and abilities in several secondary schools in Western Sydney. His research interests include the major novels of Joseph Conrad, the literary criticism of Frank Kermode, biblical apocalyptic literature and contemporary eco-critical approaches to canonical texts. As a PhD candidate in the school of HASSE, Samuel's thesis, titled 'Sudden Revelations and Inconclusive Experiences: Apocalyptic Resonances in Conrad' is supervised by Jennifer McDonell and Jennifer Hamilton.

Abstract

Building on the idea that 'the imagination … is always at the end of an era' (Kermode, 96), I synthesise three of Joseph Conrad's major novels, *Lord Jim, Nostromo* and *Under Western Eyes* using Frank Kermode's critical methodology in *The Sense of An Ending*. My research produces two key findings.

First, an apocalyptic reading of Conrad responds to the 'material turn' in Conrad studies. Eco-criticism of Conrad from the 2010s to present attends to the materiality of the environments that Conrad represents, especially where contemporary ecological concerns can be mapped onto these representations. Evaluating the gains and losses of studies within what Jeffrey Mathes McCarthy calls the 'material turn', I restore the priority of narrative in making sense of Conrad's novels. Thus, in an apocalyptic reading of Conrad, questions of content defer to those of form, safeguarding against the pitfalls of presentism.

Second, I update the discussion of Kermode's *The Sense of An Ending* by adapting his methodology to evaluate the methods of 'the material turn'. Eco-criticism generally, and specifically the material turn in Conrad studies, has co-opted the language of apocalypse in recent years to develop the concept of the Anthropocene. The Anthropocene, too, is a 'concord fiction', in Kermode's taxonomy. I argue that Kermode offers a supra-critical apparatus with which to appreciate the fictive quality of much eco-criticism, and so to qualify its authority when dealing with canonical texts.

Therefore, the critical trope of apocalypse extends the contemporary discussion of Conrad's novels by grounding it formally in these texts' multiple closural possibilities.

References

Kermode, Frank. *The Sense of an Ending: Studies in the Theory of Fiction with a New Epilogue*. Oxford UP, 2000.

Session Six

Arts (E011), A3

Theme:
Three chickpeas in a pod

Comparative analysis of the root weight and height of *Cicer echinospermum* based recombinant inbred lines to their parents and Chickpea (*Cicer arietinum*) varieties

Usifo Goodness Adebo

PhD | Animal Genetics and Breeding Unit

Biography

Goodness Adebo commenced his PhD in 2022 at Animal Genetics and Breeding Unit, UNE. His current research focuses on enhancing the selection of chickpea plants with ideal combinations of plant height and root traits when breeding for resistance to Phytophthora root rot disease. This research is a collaborative endeavour between AGBU, Chickpea Breeding Australia, and the NSW Department of Primary Industries. Prior to this time, Goodness had obtained his Bachelor's degree at the University of Agriculture, Abeokuta and Master's degrees at the University of Ibadan, and worked as a research scientist at the National Horticultural Research Institute, Ibadan, Nigeria.

Abstract

Phytophthora root rot (PRR) caused by *Phytophthora medicaginis* is a major disease of chickpea (*Cicer arietinum*) in Australia. A moderately susceptible chickpea variety, Yorker, and a partially resistant derivative of a wild relative of chickpea (*Cicer echinospermum)*, 04067-81-2-1-1 have been used to develop an F_6-recombinant inbred line (RIL) population for PRR resistance breeding. However, considering that *C. echinospermum* has a shorter height and smaller root system compared to cultivated chickpea, there are concerns that the RIL might have these undesirable features. Therefore, the root dry weight and plant height of five lines (D09024BF6RIL030, D09024BF6RIL040, D09024CF6RIL010, D09024DF6RIL028 D09024CF6RIL016) from the RIL population were evaluated along with both parents, and three chickpea varieties (Kyabra, CBA-Captain and Sonali) at Hermitage, Queensland, Australia between June and December 2018. Results showed that the RIL had similar root dry weight to the parents 040678-82-2-1-1 and Yorker. However, D09024BF6RIL030, D09024CF6RIL010 and D09024CF6RIL016 were significantly ($P \leq 0.05$) taller than Yorker but not significantly different from 04067-81-2-1-1, while D09024DF6RIL028 was significantly ($P \leq 0.05$) shorter than the parents. The remaining line was significantly ($P \leq 0.05$) shorter than 04067-82-1-1 but not significantly different from Yorker. When the RIL were compared with the chickpea varieties, it was observed that they all had significantly ($P \leq 0.05$) higher root and height values than one of the chickpea varieties, Sonali and were either similar or shorter ($P \leq 0.05$) than other chickpea varieties. This study indicated that the performance of the lines for root dry weight and plant height varied, with some lines having similar performance to the parents and chickpea, while others having lower or higher performance. With this information, trait-based selection is possible when breeding for PRR resistance chickpea varieties.

Exploring genetic diversity for genetic improvement opportunities in Chickpea Breeding Australia (CBA) program

Richard Olayiwola

PhD | Animal Genetics and Breeding Unit

Biography

Richard is passionate about crops. He specialises in plant breeding and genetics with a specific interest in exploring genetic diversity and breeding for resilience in crops. He is currently a doctoral candidate in chickpea breeding at the University of New England.

Abstract

Chickpea (*Cicer arietinum*) is a predominantly self-pollinating crop; consequently, it is inherently low in genetic diversity. Genetic diversity is the magnitude of the genetic variability (differences) in the germplasm, which determines the opportunities for sustainable genetic improvement. Chickpea Breeding Australia (CBA) has been using numerous approaches to improve germplasm diversity within its breeding program while enhancing the genetic gain of future varieties. The aim of this study will be to determine the genetic diversity within CBA germplasm using the pulse multispecies 4.5K SNP (single nucleotide polymorphisms) chip. Data will be subjected to genomic analysis to determine the extent of genetic differentiation among the genotypes and quantify the introgression from wild chickpea relatives (*C. reticulatum and C. echinospermum*). Principal component analysis (PCA) and hierarchical cluster analysis will be used to classify the individuals into genetic groups (families). Pairwise fixation index (F_{st}) will be estimated to determine the genetic differentiation among the families. Dendrogram and PCA biplot will be used to visualise the clustering patterns of the genotypes in each genetic group. These findings will help chickpea breeders determine the genetic diversity within CBA and make appropriate decisions in the future for population improvement and varietal development.

Deriving economic weights for selection in plant breeding - a systematic review

Abdul Manan Khan

PhD | Animal Genetics and Breeding Unit

Biography

Abdul Manan Khan completed his Master's degree from the University of Agriculture Faisalabad, in Pakistan with research on 'Comparative analysis on NBS-LRR encoding resistance genes in cotton'. After that, he evaluated genetically modified cotton for herbicide and bollworm tolerance to validate the transgene at lab and field conditions, followed by the USDA-ICARDA project; 'Development of Gene Construct and genetically engineered germplasm resources' to evaluate genetically modified cotton for sucking type insects at laboratory and field conditions. Before joining his PhD candidature, he worked on an ACIAR research project entitled 'Increasing productivity and profitability of pulse production in cereal-based cropping system in Pakistan'.

Abstract

The simultaneous improvement of multiple traits in plant breeding achieves overall genetic progress. Genetic gain is quantified through the aggregate of genotypes that combines multiple traits, each weighted by their respective economic weight. The economic weight represents the marginal change in profit due to a unit improvement in a trait while keeping all other traits unchanged (Hazel, 1943). These weights are assigned based on the economic importance of traits as influenced by market demands and consumer preferences. This review explored the methodologies used in plant breeding to derive economic weights for the simultaneous improvement of multiple traits. Based on a set of inclusion and exclusion criteria, 51 articles were selected for review, encompassing various crop types such as forestry, horticultural, fodder, fibre and grain crops. Different approaches were used in the articles to calculate economic weights. For forestry and fodder crops, economic variables like market price and production cost were key determinants in quantifying economic weights (Herrington et al., 2016, Smith et al., 2014). Conversely, in field crops, genetic parameters, including index coefficient, standard deviation, coefficient of variation and heritability of a trait were employed as weighting factors to measure the economic importance (Rabiei et al., 2004, Sandhu et al., 2019). However, these genetic parameters did not account for economic variables, including market price and cost of production. In conclusion, this review indicated that, in field crops, economic variables were not used to derive economic weights for various traits. This finding offers opportunities to derive economic weights based on economic input parameters as a method to prioritise multiple traits for the genetic improvement of crops based on the aggregate of genotypes.

References

Hazel 1943. The Genetic Basis for Constructing Selection Indexes. *Genetics,* 28**,** 476-490.

Herrington, M. E., Hardner, C. M., Wegener, M., Woolcock, L. L. & Dieters, M. J. 2016. Breeding objective for strawberry in subtropical southeast Queensland. *In:* Onus, N. & Currie, A. (eds.) *Acta Horticulturae.* International Society for Horticultural Science.

Rabiei, B., Valizadeh, M., Ghareyazie, B. & Moghaddam, M. 2004. Evaluation of selection indices for improving rice grain shape. *Field Crops Research,* 89**,** 359-367.

Sandhu, S. K., Kang, M. S., Akash, M. W. & Singh, P. 2019. Selection indices for improving selection efficiency in Indian mustard. *Journal of Crop Improvement,* 33**,** 25-41.

Smith, K. F., Ludemann, C., Lewis, C. D., Malcolm, B., Banks, R. G., Jacobs, J. L., Fennessy, P. F. & Spangenberg, G. C. 2014. Estimating the value of genetic gain in perennial pastures with emphasis on temperate species. *Crop and Pasture Science,* 65**,** 1230-1237.