STREAM ONE – CLINICAL / PERSONALITY / SOCIAL

SESSION ONE

9:00 - The Influence Of Whole Body Posture On Social Cognitive Conflict: An Event-Related Potential Study - Eric Sun [UNSW]
9:20 - The Role Of Impulsivity, Game Genre, And Social Engagement On Problematic Video Game Use: A Cross Sectional Study - Gavin Entwistle [USyd]
9:40 - From Which Tree Does The Apple Fall? Examining The Intergenerational Transmission Of Callous And Unemotional Traits - Antonio Mendoza Diaz [USyd]
10:00 - The Impact Of Emotion Regulation Strategies On Executive Function - Vera Newman [UNSW]

SESSION TWO

11:00 - The Effect Of Self-Control Training On Neural Responses To Provocation - Joanne Beames [UNSW]
11:20 - Increased Visual Adaptation To Happy Facial Expressions In Individuals With High Self Reported Social Anxiety - Kevin Kemkes [UNSW]
11:40 - Understanding Reduced Goal-Directed Behaviour In Depression: A Self-Regulation Perspective - Dilan Ashok Sellahewa [UNSW]
12:00 - The Man Island Project: A Qualitative Study Exploring Men’s Experience In Psychological Treatment For Depression - Zac Seidler [USyd]
12:20 - The Overlapping Yet Distinct Content Of Depressive Rumination, Generalized Worry, And Social Post-Event Processing - Ann Martin [UNSW]

SESSION THREE

1:40 - Compassionate Brain: A Pilot Self-Compassion & CBT Intervention For Middle School Students - Dr Madeleine Ferrari [USyd]
2:00 - MiCBT: The Relationship Between Parental Stress Reduction, Challenging Behaviours, And Adaptive Functioning In Children With An Intellectual Disability - Mary Girgis [UTS]
2:20 - Patient And Family Perspectives Of Treatment Decision-Making In Bipolar II Disorder: A Qualitative Study - Alana Fisher [USyd]
2:40 - Physical Health Interventions In Bipolar Disorder Neglect Psychological Factors And Eating Disorder Symptomatology: A Systematic Review - Claire McAulay [USyd]
3:00 - Next Generation Prevention Of Hereditary breast/ovarian cancer: Risk Communication Within Families – Alison Young [USyd]

SESSION FOUR

3:40 - Connected Connections: Humanity And Nature - Sam Moreton [USyd]
4:00 - Reflecting upon Death as a Pathway to Authentic Motivation - Andrew Arena [USyd]
4:40 - The Emergence Of Moral Identity In Middle Childhood - Jess Kingsford [USyd]
5:00 - Social Competence In Filipino Deaf Individuals: The Impact Of Emotion Understanding – Ma Regina de Gracia [USyd]
The Influence Of Whole Body Posture On Social Cognitive Conflict: An Event-Related Potential Study

Eric Sun
University of New South Wales

We have previously found that the processing of cognitive conflict is modified by body posture, such that a supine body posture (associated with lower approach motivation) reduces cognitive conflict. The present research was designed to test whether body posture would influence cognitive conflict when the conflict was more social. Based on previous research that has found that some European Americans show exaggerated cognitive conflict after making mistakes that suggests they are prejudiced toward African Americans, we modified the task used in this previous research so that it was suitable for measuring conflict about being prejudiced toward Muslims. The body posture of participants was manipulated (sitting upright vs. supine) while participants’ brain potentials were measured. Behavioral results revealed that the race-bias responses were found in both reaction times and error rates (faster reaction times on correct gun trials preceded by Muslim faces compared to White faces and higher error rates on tool trials preceded by Muslim faces compared to White faces). In addition, brain potential results revealed that across all participants, erroneous responses elicited larger negative deflections than correct responses, typical of error-related negativity (ERN). Moreover, the ERN magnitude of White-Gun trials was smaller in the supine posture than in the sitting upright posture. In contrast, the ERN magnitude of Muslim-Tool trials, the neural detection of race-biased errors, was not modulated by body posture. Implications for prejudice, motivation, and self-regulation were further discussed.
The Role Of Impulsivity, Game Genre, And Social Engagement On Problematic Video Game Use: A Cross Sectional Study

Gavin Entwistle
University of Sydney

Proposed criteria for internet gaming disorder are included in the DSM-V (APA, 2013). For problematic video game use (PVGU) to be recognised as a unique syndrome, it must be shown that problematic use is intrinsically related to the game itself. Research looking at video game genres or types provides one way to test this hypothesis; however most studies that have considered game type have failed to use a systematic game classification system, and do not assess social or online engagement. It is hypothesised that social engagement, not game type, predicts PVGU. Other studies have shown a link between impulsivity and PVGU, but have not shown how impulsivity leads to problematic use. An additional hypothesis is that game type and/or social engagement may be involved in the relationship between impulsivity and PVGU. The study aims to consider these hypotheses in an international online survey for individuals aged 14 and older, which will run in early 2017.
Twin studies of callous and unemotional (CU) traits have revealed substantial genetic contribution from parents (heritability coefficients ~.45-.67; Viding et al., 2013). Yet it is unlikely that these traits are associated with specific genes (Viding et al., 2013). This suggests behavioural and personality profiles of parents are an optimal target for understanding the emergence of CU traits in children. To date, only a single study had examined the relationship between parental psychopathy and children's own CU traits (Loney et al., 2007). Loney and colleague's study (2007), using a sample of mother-son dyads, suggested a significant association between mother's secondary psychopathy and children's CU traits. The current study addresses the gender disparity gap in the literature by examining the relationship between parental psychopathy and children's CU traits using parents and children of both genders. Results suggest that the father's primary psychopathy and the mother's secondary psychopathy are both associated with boys' CU traits. However, it appears only the father's primary psychopathy is not mediated by other risk factors associated with boys' CU traits. In contrast, parental psychopathy was not significantly related to girls' CU traits. These surprising findings suggest an undue focus on mothers may be compromising the aetiological study of CU traits.
Emotions are a pervasive aspect of daily life, and they often need to be regulated to maintain adequate task performance. However, previous research indicates that different emotion regulation (ER) strategies, for example reappraisal versus distraction, are more or less appropriate dependent on context. For the current study, participants (N = 127) undertook a classic task-switching task; prior to each trial a negative or neutral task-irrelevant distractor was presented. Participants performed a baseline block of the task, and then were given additional instructions on an ER strategy: reappraisal, distraction, or control (no instructions). Results indicate that, for negative trials a Trial Type (Switch versus Run) X Condition interaction was observed (p = .009). Follow-up tests indicated that, for switch trials, participants given reappraisal instructions were significantly slower than those given distraction instructions (p = .026). In contrast, for run trials, there was no difference between those given reappraisal versus distraction ER instructions (p = .724). Despite the differential effects of ER strategy on performance, both strategies resulted in significant decreases in self-rated negative affect (p’s < .05). These results demonstrate that different ER strategies might be more adaptive and suitable for tasks of different types, and question the utility of a one-size-fits-all approach to emotion regulation techniques.
Optimal Dot Probe Parameters For Identifying Attentional Biases In Pain: A Meta-Analysis

Jemma Todd
University of Sydney

Studies investigating attentional biases towards pain information vary widely in both design and results. Therefore, the aim of this meta-analysis was to determine the degree to which attentional biases towards pain occur when measured with the dot-probe paradigm. A total of 1783 references were screened using a detailed protocol, resulting in a final sample of 3446 subjects from 37 articles. Subjects were grouped according to pain category: chronic pain, acute pain, anticipating pain, social concern for pain, or healthy. Attentional biases towards sensory pain stimuli were small but significant within the chronic pain group (d = 0.23), but not other groups. Attentional biases towards affective pain stimuli were not significant. Although there is some confounding of individual parameters, results suggest that paradigms that use the following parameters are more likely to give rise to differences in attention biases towards sensory pain information in chronic pain patients compared to healthy individuals: Upper-lower stimuli orientation, 500-1000ms stimuli presentation, no gaze maintenance, probe discrimination, and responding to the probe using a keyboard with two hands. Insights in these parameters can help to understand the underlying mechanisms and create the optimal task design in order to better detect and modify attentional biases in pain.
Previous studies have shown that self-control training (SCT) can reduce behavioural aggression following provocation, but have not provided conclusive evidence for the mechanisms underlying this effect. It remains unclear whether SCT reduces aggressive behaviour by directly reducing the desire to aggress or by increasing cognitive control over such desires. The current study aimed to identify the neural mechanisms involved in aggressive responses to provocation, and to determine how SCT impacts the activation in these neural networks. Sixty participants completed two-weeks of SCT or a control task. At the end of the training period, participants were provoked while their brain activity was measured using functional magnetic resonance imaging (fMRI). We plan to investigate the neural bases of anger regulation (following provocation) as a function of SCT. We will examine the group differences between participants' baseline amygdala reactivity, and the functional coupling between their prefrontal cortex and amygdala circuitry. The current study could have significant implications for increasing control over aggressive desires. Understanding how SCT works at the neural level is important because it could lead to the development of more effective aggression-reduction techniques in the community, particularly for those individuals who have marked self-control deficits or impulsive tendencies.
Increased Visual Adaptation To Happy Facial Expressions In Individuals With High Self-Reported Social Anxiety

Kevin Kemkes  
*University of New South Wales*

Studies into social anxiety often focus on abnormalities in the processing of momentarily displayed facial expressions (Staugaard, 2010). One important principle of perceiving emotional expressions in dynamic contexts is that these are recognised based on deviations from a ‘neutral norm’ that can be affected by recent exposures (Webster & MacLeod, 2011). Adaptation in this context occurs when viewing an emotional expression shifts the neutral norm towards the properties of the current expression, biasing the perceived appearance of subsequent expressions. The current study was the first to investigate if participants with high self-reported social anxiety show stronger adaptation effects to expressions indicating social reward but weaker adaptation to expressions indicating social threat compared those with low anxiety. Results indicated that participants with high social anxiety show increased adaptation to happy faces, resulting in a stronger reduction in recognition of subsequent happy facial expressions. No differences in the adaptation effects for angry and disgusted faces were found. The results are in line with theories suggesting that social anxiety is related to diminished positive experiences in social situations.
Reductions in goal-directed behaviour predict poorer functional outcomes and quality of life for depressed individuals. It is important to identify psychological mechanisms that determine these debilitating behavioural features. I will approach this problem by comparing cybernetic theories of effective self-regulation against behavioural models of depression. Thus, I will propose that depressed individuals may demonstrate self-regulatory dysfunctions that engender low rates of goal-directed behaviour. Specifically, depressed individuals may reduce their goal-directed behaviour in response to negative affect experienced when making poor progress towards goals. By contrast, non-depressed individuals might increase their goal-directed behaviour under the same conditions. Although these predictions are consistent with current theoretical and empirical literature, they have yet to be directly examined. I will outline proposed studies that will utilise a modified ‘false feedback’ paradigm in order to test the present predictions. Research findings may provide preliminary evidence for previously under-recognised self-regulatory dysfunctions that contribute to behavioural problems in depression.
The Man Island Project: A Qualitative Study Exploring Men’s Experience In Psychological Treatment For Depression

Zac Seidler
University of Sydney

**Background:** While the prevalence of major depressive disorder continues to rise, men are consistently found to seek help at nearly half the rate of women for mental health concerns. As public awareness campaigns start to bridge this gap, it’s important to explore how men experience existing forms of psychological therapy and what may need to change in order to improve treatment engagement while reducing the seemingly stagnant male suicide rate.

**Methods:** Twenty men aged 23-64 who had received psychological treatment for depressive symptoms in the past three years took part in a semi-structured interview. Participants were recruited using advertising on social media and through existing research registers. Interviews were transcribed and coded in line with the interpretive description methodology, focused on applied conclusions for clinical practice.

**Results:** Findings suggest that men typically experience a fragmented and lengthy pathway through treatment, often typified by moments of crisis, denial and treatment dropout. Participants suggested that it often took ‘luck’ or ‘trial and error’ to find the right therapist and treatment style. However, there were commonalities in their experience of, or preference for, engaging treatment. A clear structure for therapy, focusing on goals and expected progress was key and providing a ‘functional’ treatment that was action-oriented and targeted problem solving was recommended as most engaging. The participants expressed a desire to know more about different treatment approaches and referral pathways, noting that honesty, transparency and patient-centred collaboration in a therapist made the men more likely to continue with treatment.

**Conclusion:** Masculine norms and pervading societal stigma continue to impact how men experience and engage in psychological treatment for depression. Adapting our existing approaches to be more ‘gender sensitive’ in providing therapists with targeted training will ensure that men are offered a more appropriate service to address their needs.
The Overlapping Yet Distinct Content Of Depressive Rumination, Generalized Worry, And Social Post-Event Processing

Ann Martin
University of New South Wales

It is well established that repetitive thought processes such as rumination and worry play a key role in the etiology and maintenance of mood disorders (for a review see Watkins, 2008). Questionnaires typically assess rumination and worry by asking participants to rate their endorsement of sentence-based statements (e.g. “I worry about seeming foolish to others”). However, experiments studying repetitive thought often require single-word stimuli (e.g. “foolish”). To date, the closest available word lists have been normed based on discrete emotions (e.g. “sadness”). However, these words align more closely with mood disorder symptoms than they do with repetitive thought content. The present study developed and validated a bank of words that represent the content of depressive rumination, generalized anxiety worries, and social anxiety post-event processing, as well as appropriate controls. Beyond the development of experimental stimuli, the findings of this study offer a useful resource for clinical practice. The lists of validated words may provide a scaffold of negative automatic thoughts for early career psychologists to consider during assessment, including distinct themes that may assist with differential diagnosis.
Compassionate Brain: A Pilot Self-Compassion & CBT Intervention For Middle School Students

Dr Madeleine Ferrari
University of Sydney

Self-compassion refers to treating oneself with kindness and understanding in times of difficulty instead of self-criticism. A growing body of research points to self-compassion as being a strong predictor of emotional wellbeing, even protecting against the development of psychopathology. This pilot cohort-comparison trial assessed the efficacy of a novel self-compassion and CBT psychoeducational intervention for year 7 middle school students (N = 93) compared to a year 6 control group (N = 46). The primary skills targeted by the intervention that were assessed included self-compassion and mindfulness. In addition, outcome measures assessed general psychological wellbeing, fears of positive and negative evaluation, low mood, and perfectionism. Data was collected at three time-points; baseline, post the 8 week intervention and at 4 month follow-up. A review of this study will assess treatment efficacy and discuss the effectiveness of targeting general psychoeducation programs at a health community sample through schools.
MiCBT: The Relationship Between Parental Stress Reduction, Challenging Behaviours, And Adaptive Functioning In Children With An Intellectual Disability

Mary Girgis
University of Technology, Sydney

Background: Research suggests the reduction of parental stress will subsequently lead to a reduction in challenging behaviour in children with an intellectual disability, and facilitate the development of adaptive functioning. As such, the relationship between parental stress, challenging behaviour, and adaptive functioning needs to be assessed. Aims: The study investigates the effectiveness of mindfulness integrated cognitive behaviour therapy (MiCBT) in reducing parental stress. Methods and procedure: The study utilised a staggered multiple baseline design. Four participants completed eight sessions of MiCBT. Outcomes and results: The PSI-SF were used to assess parental stress, the DASS-21 was used to assess mood, the CBCL was used to measure challenging behaviours in children, and the ABAS-II was used to measure the adaptive functioning of the child. The results indicated all participants had a reliable decrease in one or domains of the CBCL. Additionally, MiCBT was most effective when mindfulness was practised on a daily basis, as higher levels of practise were associated with greater reliable reductions in parenting stress. Conclusions and Implications: The study’s results provide preliminary evidence for Hasting’s (2002) model. However, due to the small sample size, it is unclear whether the reduction in challenging behaviours is due to increased acceptance, due to the MiCBT intervention, or due to a true reduction in challenging behaviour.
Patient And Family Perspectives Of Treatment Decision-Making In Bipolar II Disorder: A Qualitative Study

Alana Fisher
University of Sydney

*Introduction:* Available treatment options bipolar II disorder (BPII) are supported by limited evidence and have varying benefit/side-effect profiles. This signals a need for shared decision-making where final treatment choices incorporate both clinical evidence and patient preferences for treatment. However, the decisional-support needs of these patients remain unknown. This study explored the experiences patients with BPII and family regarding treatment decision-making.

*Methods:* Semi-structured, qualitative interviews involved 28 patients with a BPII diagnosis and 13 family members with experience in treatment decision-making in the outpatient setting. Interviews were audio-taped, transcribed verbatim and analysed thematically using framework methods.

*Results:* Four inter-related themes emerged: 1) Attitudes and response to diagnosis and treatment; 2) Influences on decision-making; 3) The nature and flow of decision-making; and 4) Decision support and challenges. Themes 1 and 2 appeared to ‘set-the-scene’ for treatment decision-making in this setting. Theme 3 described how the decision-making process unfolds both within and out of consultation. Theme 4 highlighted (unmet) decision-support needs spanning relational, informational, and systemic domains.

*Conclusions:* These findings provide novel qualitative insights into patient and family views and experiences of treatment decision-making in BPII. Findings also provide directions for future decision-support resources for enhancing treatment decision-making in this setting.
Bipolar disorder is associated with a range of physical health sequelae for a range of reasons. High rates of comorbid eating disorders in this group may also contribute to poor physical health, given rates of binge eating as high as 25%. ‘Lifestyle interventions’ target physical health by addressing obesity, poor diet, and sedentary lifestyles. This systematic review aimed to explore the efficacy of lifestyle interventions targeting weight loss or maintenance in Bipolar Disorder. It aimed to investigate a) whether psychological factors associated with poor physical health were routinely measured, b) whether authors screened for or targeted eating disorder symptomatology, and c) whether evidence-based psychological methods were commonly utilized. PubMed, Medline, SCOPUS and Ovid were systematically searched. Searches were limited to English-language papers and a manual search was also conducted. A total of 242 studies (after removing 52 duplicates) were screened, followed by 35 full text reviews which generated a final list of 25 quantitative studies. Studies showed some success in promoting weight loss. Common study limitations include a lack of a control group, highly heterogeneous samples of varying weight, failing to report BMI or waist circumference, and non-specialist treatment providers. Few studies screened for or excluded participants with eating disorders, and none explicitly targeted eating-disordered cognitions and behaviours. Use of psychological techniques was limited to a third of studies, with psychological outcomes assessed in only half. In this emergent field, a number of methodological issues may contribute to the limited outcomes. Future research should consider exploring psychological pathways to improving diet, exercise, and other health behaviours, by limiting participants to those with bipolar disorder, and screening for eating-disorder symptoms.
Next Generation Prevention Of Hereditary Breast/Ovarian Cancer: Risk Communication Within Families

Alison Young
*University of Sydney*

Individuals with a BRCA1 or 2 gene mutation have an increased risk of developing breast/ovarian cancer. Their offspring have 50% of inheriting the gene mutation. Parents are amongst the first people to inform their offspring of genetic risk. Very few studies have explored communication processes by inviting all members of the immediate family to participate in a family interview. The proposed study will explore risk communication between offspring and their parents, at least one of whom has a BRCA1 or 2 gene mutation. Offspring between the ages of 18-40 years old will be invited to participate in the study since they are at an age when decisions about risk management options are important. The individual and collective experience of parents, sons, and daughters will be explored qualitatively and quantitatively.
Connected Connections: Humanity And Nature

Sam Moreton  
*University of Sydney*

Similarly to how humans form emotional connections to other humans, research has documents that they often have emotional connections to the natural world. Previous research indicates correlations between Connectedness to Nature and several indices of connection to humanity. In the present investigation, six studies were conducted to investigate which aspects of social connection relates most strongly to connection to nature (Study 1) and the causal nature of this relationship (Studies 2-6). Study 1 found connection to nature was more strongly related to aspects of social connection at higher levels of the moral circle (e.g. connection to humanity as a whole, other races) rather than at lower levels (e.g. connection to family and friends). In an investigation into the causal nature of this relationship, ostracism in a ball-throwing game (Studies 2-4) resulted in decreased feelings of connection to nature. However, these effects were not replicated in Study 5 using another social exclusion paradigm. Study 6 represents the first step in testing whether the relationship between social and nature connection can be explained by certain types of positive emotions. Ongoing research attempts to further clarify the causal relationship between positive emotions, connection to humanity and connection to nature. Overall, this research aims to inform our understanding of the mechanisms by which the moral circle may expand and constrict.
Reflecting upon Death as a Pathway to Authentic Motivation

Andrew Arena
University of Sydney

Research in areas such as Post-Traumatic Growth and Near-Death Experiences suggest that confronting one’s mortality in a deeply reflective way can lead to greater authenticity. Thus an alternate pathway to responding to death awareness is put forth which differs from that within Terror Management Theory- whereby individuals tend to defensively cling to their own cultural worldview more fervently, rather than adjusting their worldview to be more personally valid. To test whether the ‘authentic pathway’ is a legitimate response tendency, 194 undergraduate students were first given measures of general motivational style before being asked to imagine experiencing either a detailed death scenario or a visit with family. Open-ended questions were also given in order to probe the participants’ thoughts and emotions regarding their death, at a deeper level than that typical in the Terror Management literature. Participants then responded to measures of authentic motivation for their current personal goals. It was found that after visualizing and reflecting upon one’s death, those lower in baseline authenticity increased their level of authentic motivation, supporting the notion of a positive, accommodative approach to confronting one’s mortality.
Chinese immigration to Western countries has risen rapidly over the past few decades. ‘Cultural homelessness’ has been identified as a potential psychological problem for Chinese immigrants, for whom disruptions to identity development have negative effects, while the benefits of an established ‘bicultural identity’ have also been noted. It is important to consider the value of qualitative research in providing enriched perspectives on cultural identity in Chinese immigrant populations with respect to their unique experiences. Therefore, a meta-synthesis implementing a thematic analysis of existing qualitative studies on identity negotiation in Chinese immigrants to Western countries was performed. The inclusion criteria were qualitative semi-structured interview data collection from participants and examination of the process of identity negotiation in Chinese immigrants to countries of Western culture. Four higher-order constructs emerged from this analysis. 1. Identity negotiation is an ongoing process for Chinese immigrant generations as a result of dynamic cultural contexts. 2. The sense of being ‘in between’ cultures is confusing and challenging. 3. The challenge of racism is a salient sociopolitical influence upon identity development. 4. A strong awareness and acceptance of the role of ethnic Chinese culture marks mature identities. These conceptual constructs have important implications for the individuals and their families, and for public policy, professional practice, and research.
What motivates moral behaviour? Is it Knowledge? Reasoning skills? Empathy? In fact, we may be guided less by what we know to be morally right than by a sense of personal responsibility to be consistent with the kind of person we think we are in moral terms; in other words, by our moral identity. This idea has gained ground over recent years, yet the developmental questions raised by this literature have received scant attention. Contrary to current thinking - that moral identity emerges either during early childhood or not until adolescence, findings from three studies to be presented demonstrate support for an alternative, more likely, possibility - that moral identity first emerges during middle childhood - that is, when children first become capable of self-reflection and of thinking about themselves in generalised terms. Furthermore, findings suggest that the ability to experience and attribute self-directed shame also emerges at this age, and that it does so as a consequence of an emerging moral identity. Identity may prove to be the cornerstone of both moral responsibility and moral shame.
Social Competence In Filipino Deaf Individuals: The Impact Of Emotion Understanding

Ma Regina de Gracia
University of Sydney

The role of emotion understanding in developing social competence in Filipino deaf individuals was examined. One hundred deaf individuals, ages 8 to 22, from urban Metro Manila were recruited for the study. The deaf participants were administered well-established measures of theory of mind and emotion understanding while teachers rated the participants’ social competence in terms of peer social maturity, prosocial behavior, and difficulties in social interaction. Results show that emotion understanding predicted deaf participants’ social competence on all domains, independent of age, sex, verbal ability, and theory of mind. Implications were discussed.
STREAM TWO – LEARNING / COGNITION / PERCEPTION

SESSION ONE

9:00 - The Effects Of Trials Versus Time On The Persistence Of Partially Reinforced Responding - Jonas Chan [USyd]
9:20 - Learning, Attention, And The Exploration/Exploitation Trade-Off: Integrating Associative Learning With Decision Making - Adrian Walker [UNSW]
9:40 - Cortical Excitability And Stop Signal Inhibition - Nahian Chowdhury [USyd]
10:00 - Oxytocin Interacts With Vasopressin Receptors To Reduce Relapse To Methamphetamine Seeking Behaviours In Rats - Nick Everett [MQ]

SESSION TWO

11:00 - Fear Generalisation In High And Low Anxious Individuals - Alex Wong [UNSW]
11:20 - Role Of Midbrain Dopamine Circuits In Fear Learning - Constance Peng [UNSW]
11:40 - Fear Extinction In Females With And Without Reproductive Experience - Samantha Tang [UNSW]
12:00 - Physical Exercise Enhances Conditioned Fear Extinction - Dharani Keyan [UNSW]
12:20 - Imagining Your Attachment Figure Can Reduce Fear Learning - Metaxia Kokkinos [UNSW]

SESSION THREE

1:40 - Differential Attenuation Of Auditory And Visual Evoked Potentials For Sensations Generated By Hand And Eye Movements - Nathan Mifsud [UNSW]
2:00 - Nice And Slow: Measuring The Sensitivity And Aesthetic Preference Of Naturalistic Stimuli Varying In Their Amplitude Spectra In Space And Time - Zoey Isherwood [UNSW]
2:20 - What Is Continuous Flash Suppression? - Shui Han [USyd]
3:00 - Visual Processing: Conscious Until Proven Otherwise - Tarryn Balsdon [UNSW]

SESSION FOUR

3:40 - Coloured-Calculations - Joshua Berger [USyd]
4:00 - Negative Affective Responses to Simple Inconsistencies - Nicholas Levy [UNSW]
5:00 - Using Hypnosis to Investigate Cognitive Mechanisms within a Cognitive Science of Religion Framework - Olivia Green [MQ]
Responding acquired on a continuously reinforced (CRF) schedule typically extinguishes faster than responding on a partially reinforced (PRF) schedule. However, this partial reinforcement extinction effect (PREE) is confounded when PRF and CRF schedules are reinforced at unequal rates. This creates differences in levels of responding that make it difficult to compare the PRF and CRF CSs directly. We compared the rate of extinction between a long CRF CS and a short PRF CS that were matched on reinforcement rate per unit time (the PRF CS was reinforced on 1/3rd of trials but was 1/3rd the length of the CRF CS). Levels of responding to the two CSs were equal during training but extinguished at different rates, confirming a PREE. In a second experiment, the PREE disappeared when the PRF CS was given a larger number of extinction trials than the CRF CS, corresponding to the difference in their number of trials per reinforcement in training. In contrast, making the PRF CS longer during extinction did not affect the PREE. This shows that extinction is modulated by the per-trial rate of reinforcement during conditioning, rather than the overall cumulative reinforcer rate.
How do we direct our attention to stimuli in our environment? One prevailing view is that items that are predictive of events will attract our attention (e.g., a green traffic light predicts a clear road). This allows us to optimize our limited cognitive resources to make better decisions based on what is around us. However, when stimuli are followed by unexpected events (e.g., a truck running a red light), this uncertainty alters our attention to other potentially relevant stimuli in the environment. This problem is analogous to the Exploitation/Exploration trade-off, in which we make choices between something familiar (Exploitation) and something unknown (Exploration). By exploiting our knowledge in a stable environment, we can receive guaranteed rewards. However, when our environment is uncertain, exploration can allow us to identify new information to resolve this uncertainty and make better decisions in the future. My research focuses on bridging the gap between learning, attention, and the Exploitation/Exploration trade-off in decision making.
In Transcranial Magnetic Stimulation (TMS), cortical excitability reduces when a TMS pulse is preceded by a weak “conditioning” pulse separated by an interval of 2-5 ms. This reduction is called Short-Interval Intra-Cortical Inhibition (SICI), and is thought to reflect the activation of inhibitory interneurons. Studies are yet to determine whether SICI can distinguish individuals who have poor or good behavioural inhibition. Accordingly, our goal was to determine whether there is a relationship between SICI and the latency for an individual to stop a cued response, measured as Stop Signal Reaction Time (SSRT). In an initial study, we measured SICI during resting motor activity. Participants (n=32) separately completed the stop signal task to obtain a measure of SSRT. Results revealed a significant correlation between resting SICI and SSRT, such that those with longer SSRTs had weaker SICI. We built on this finding in a second study by measuring SICI during the stop signal task itself. Preliminary findings (n=16) found that the magnitude of SICI during attempted inhibition was weaker in individuals with longer SSRTs. In summary, our findings suggest one’s behavioural inhibition may be meaningfully predicted by SICI.
Oxytocin Interacts With Vasopressin Receptors To Reduce Relapse To Methamphetamine-Seeking Behaviours In Rats

Nick Everett  
*Macquarie University*

Oxytocin has shown promise as an effective therapy for methamphetamine (METH) dependence in pre-clinical models of addiction. However, the mechanisms by which oxytocin acts in the brain to reduce relapse are largely unknown. The nucleus accumbens core (NAcc) has been identified as an important site for these METH-oxytocin interactions, although the oxytocin receptor does not appear to be the primary mediator of this interaction, suggesting involvement of other receptor systems. The vasopressin V1a receptor (V1aR) has been implicated in numerous oxytocin-dependent physiological and behavioural effects. As such, the aim of this study was to investigate the V1aR as a mediator of the inhibitory effects of oxytocin on relapse to METH-seeking behaviour. 32 male rats were implanted with intravenous jugular vein catheters, and 16 received bilateral cannulae into the NAcc. Rats were trained to self-administer METH by lever pressing during daily 2-hr FR-1 sessions for 20 days. Following extinction of lever pressing, rats were tested for the effects of oxytocin alone, and when co-administered with a V1aR antagonist on METH-primed reinstatement of METH-seeking behaviours, when administered systemically, or locally into the NAcc. Systemic administration of oxytocin prevented METH-primed reinstatement of drug-seeking behaviour, an effect which was blocked by pre-treatment with a V1aR antagonist. Administration of oxytocin into the NAcc reduced METH-primed reinstatement, but not when co-administered with a V1aR antagonist. The inhibitory effects of oxytocin on relapse to METH-seeking behaviours appear to require availability of the V1aR. This has significant implications for the development and discovery of novel pharmacotherapies for treating METH dependence.
Fear generalisation refers to the transfer of fear responses to novel objects, which helps us to avoid potential dangers. However, excessive fear generalisation could be maladaptive, which is one of the major characteristics commonly found in anxiety patients. Besides, past studies suggested that highly anxious individuals are more vulnerable to develop anxiety disorders. The current study aims to find out if high anxious individuals show overgeneralisation of fear when compared to the low anxious counterparts. Generalisation was tested by presenting stimuli that were novel, but similar to the conditioned stimulus along a spatial stimulus dimension. Dependent measures were online shock expectancy ratings as well as skin conductance recordings. Excessive fear generalisation (at least in expectancy ratings) was found among high anxious individuals, but only when ambiguity was presented. The present findings points to an important role of ambiguity, and how it modulates overgeneralisation of fear in high anxious individuals.
Dopamine, a neurotransmitter well-known for mediating reward learning, also has a role in fear learning and threat-related attention. Such attentional and learning processes often go astray in psychological disorders such as anxiety and schizophrenia. The mechanisms via which dopamine parses danger signals are poorly understood. Previous studies have shown conflicting findings, with dopamine neurons in the midbrain ventral tegmental area (VTA) exhibiting phasic excitations, inhibitions or no change in response to aversive stimuli. Both increases and decreases in dopamine release have also been found in VTA nerve terminals during fear learning. More recent evidence suggests that this heterogeneity of VTA dopamine neurons is due to their segregation into specific input/output channels. Using optogenetics and transgenic rats, I am investigating the role of specific dopaminergic pathways in encoding three features of a threat-signaling stimulus: intrinsic salience, predictiveness and uncertainty.
Fear extinction, the predominant laboratory model for the treatment of anxiety disorders, is influenced by the sex hormone estradiol in virgin (nulliparous) females, but not reproductively experienced (primiparous) females. This dissociation may be due to a change in the neurobiological processes underlying fear extinction following reproductive experience. My research therefore seeks to compare the neurobiological features of fear extinction between nulliparous and primiparous female rats. In this work, I have found that the activation of N-methyl-D-aspartate (NMDA) receptors may not be necessary for fear extinction in primiparous females, like it is in nulliparous females. However, NMDA receptor activation may not be necessary for extinction in either group of females when the duration of extinction is increased. Such findings provide preliminary evidence to suggest that the neurobiological processes underlying fear extinction may be altered as a consequence of reproductive experience.
Physical Exercise Enhances Conditioned Fear Extinction

Dharani Keyan

University of New South Wales

Recall of conditioned fear extinction forms the basis of exposure based interventions for anxiety disorders. Investigating ways to enhance this process is arguably beneficial for treatment optimisation. The current study investigated the role of intense physical exercise in modulating conditioned fear extinction. Fifty-seven undergraduate students underwent a differential fear conditioning and extinction paradigm, and were then randomised to engage in either intense or mild (i.e., no exercise) cycling for 20 minutes. One day later, extinction recall was tested, and fear potentiated startle was utilised to determine conditioned fear. Results revealed that exercised participants displayed an overall lower fear response, and significantly lower return of fear relative to non-exercised participants. These findings point to a promising strategy by which current exposure based interventions may be augmented.
STREAM TWO – SESSION TWO

Imagining Your Attachment Figure Can Reduce Fear Learning

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Recent research has shown that activating the attachment system reduces the fear response. The literature so far has not extended these findings to fear learning, which is often used to model the development of fear underlying certain psychological disorders. Therefore, this study aimed to examine the effect of attachment priming on fear learning. Participants were instructed to vividly imagine either an attachment figure or a pleasant situation, before undergoing a fear conditioning and fear extinction paradigm. Fear conditioning involved learning that a neutral stimulus predicted the delivery of a mild electric shock. Extinction was when that stimulus was presented repeatedly in the absence of the shock. Participants returned two days later for an extinction retention task to assess for recovery of fear. The attachment prime led to lower fear potentiated startle during the conditioning phase, meaning that it reduced fear learning. It also led to lower recovery of fear two days later. These findings provide preliminary evidence for the protective nature of attachment relationships at times that are characterized by fear learning, for example during a traumatic experience.
Differential Attenuation Of Auditory And Visual Evoked Potentials For Sensations Generated By Hand And Eye Movements

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Our ability to distinguish sensations caused by our own actions from those caused by the external world is reflected at a neurophysiological level by the reduction of event-related potentials (ERPs) to self-initiated stimuli. These ERP differences have been taken as evidence for a predictive model in which motor command copies suppress sensory representations of incoming stimuli, but they could also be attributed to learned associations. We tested the generalizability of the predictive account across modalities by comparing auditory and visual responses in the same cohort, and tested the associative account with a novel task in which eye motor output produced auditory sensory input, an action-sensation contingency which no participant could have previously experienced. We measured the electroencephalogram (EEG) of 33 participants as they produced auditory (pure tone) and visual (unstructured flash) stimuli with either button-presses or volitional saccades. We found that attenuation of self-initiated sensations, indexed by auditory and visual N1-components, significantly differed by sensory domain and motor area, and was strongest for natural associations between action and sensation (i.e., hand-auditory and eye-visual). Our results suggest that predictive and associative mechanisms interact to dampen self-initiated stimuli, serving to facilitate self-awareness and efficient sensory processing.
STREAM TWO – SESSION THREE

Nice And Slow: Measuring The Sensitivity And Aesthetic Preference Of Naturalistic Stimuli Varying In Their Amplitude Spectra In Space And Time

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Background: The $1/f^\alpha$ amplitude spectrum is a statistical property of natural scenes characterising a specific distribution of spatial and temporal frequencies and their associated luminance intensities. This property has been studied extensively in the spatial domain whereby sensitivity and aesthetic preference overlap and peak for slopes within the natural range ($\alpha = 1.2$). However, little is known about sensitivity and aesthetic preference to these statistical properties in the temporal domain. It is unknown whether sensitivity and aesthetic preference would be highest in response to a natural distribution of temporal frequencies ($\alpha = 1.2$), and whether they closely match across a range of slopes. Methods: To address this, a 4AFC task was used to measure sensitivity and a 2AFC task was used to measure aesthetic preference across a wide range of spatial (0.25, 1.25, 2.25) and temporal slopes (0.25, 0.75, 1.25, 1.75, 2.25). Stimuli with shallow temporal slopes move rapidly (i.e. 0.25), whereas stimuli with steep slopes move slowly (i.e. 2.25). Results: In both tasks, a significant effect was found for temporal slope variations, however the effect of spatial slope was non significant. Interestingly, sensitivity and aesthetic preference did not closely overlap. Sensitivity was highest for the most natural temporal slope in our stimulus set (1.25), however preference was highest for a temporal slope of 2.25. Discussion: While the sensitivity of the visual system is highest for our intermediate speed stimulus (1.25), which is most abundant in nature, the slowest moving stimulus (2.25) seemed most preferred. A potential reason for these results might be related to the significance of these signals in evolutionary terms. Consider the cases of waves slowly vs. rapidly crashing on a beach or fast vs. slow animals. In both instances the slowest option is often the safest and preferential, which may be the reason for this deviation in sensitivity and aesthetic preference.
What Is Continuous Flash Suppression?

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Continuous flash suppression (CFS) is a psychophysical technique where a rapidly changing Mondrian pattern viewed in one eye suppresses the target in the other eye for several seconds. Despite its widespread use in the study of awareness and unconscious processing, it remains unclear why CFS provides such strong and effective suppression. As a start, we used Fourier Transform techniques and examined the spatiotemporal properties of the Mondrian masker. Using the same techniques, properties found likely to be critical in CFS were then verified with spatiotemporally controlled stimuli. Our results show that CFS suppression was not only temporal frequency and orientation selective, but also dependent on pattern structure. Reminiscent of binocular rivalry suppression, these findings suggest a parsimonious framework for the study of CFS, and raise the importance of using spatiotemporally controlled stimuli.
Oscillations Of Sensitivity And Criterion Synchronised With Action

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Increasing evidence shows that perception itself may be intrinsically rhythmic, i.e., perception is better or worse depending on the phase of the periodic neural oscillation. Psychophysical studies have revealed theta (4-8 Hz) and alpha (8-12 Hz) rhythms of visual performance. However, few studies examined behavioural oscillations in the framework of signal detection theory (SDT), according to which the perceptual decision is determined by sensitivity and criterion. Using a visual discrimination task with fine-grained time course, here we examined whether the sensitivity and criterion oscillated over time and whether learning could affect oscillations. Participants did two sessions on two days. They started each trial by pressing a button and then discriminated the orientation of a brief noisy visual grating at the threshold level (75% correct). We found that in the first session, the sensitivity oscillated around 5.8 Hz and 10.2 Hz and the criterion oscillated around 10.5 Hz. However, in the second session, the sensitivity oscillated around 8.3 Hz, which criterion did not show any significant oscillation. Our results suggest that sensitivity and criterion might be two independent components; the oscillation of criterion only occurs at the early stage of learning.
Unconscious perception, or perception without awareness, describes when an observer has no phenomenal awareness of a stimulus yet their behavior or decisions are still influenced by that stimulus. Perception without awareness is often demonstrated by a difference in thresholds for tasks that do and do not require awareness, for example, a difference in the threshold for detecting the stimulus (requiring awareness) and the threshold for making accurate semantic judgements about the stimulus (based on unconscious perceptual evidence). Although a difference in thresholds would be expected if perceptual evidence were being processed without reaching awareness, the difference does not necessitate that this is actually occurring: a difference in thresholds may also have arisen from confounds in the measurements of thresholds, such as response bias, or because of differences in the tasks used for obtaining thresholds. Here we propose a different tactic for establishing perception without awareness: we ask instead whether the pattern of performance suggestive of perception without awareness could be obtained if the observer used only perceptual evidence that they were aware of in making their perceptual decisions. A backwards masking paradigm was designed based on previous experiments in the literature; using Arabic digits as target stimuli, with task difficulty being controlled by the length of time between target and mask. Performance was measured over three tasks: a detection task, a graphic discrimination task, and a semantic discrimination task. Despite finding a significant difference in thresholds measured using proportion correct, and significant differences in observer sensitivity for each decision, modelling suggests that these differences were not the result of perception without awareness. That is, the pattern of performance could have been achieved even if the observer was only using conscious information to make decisions.
Try to imagine that every time you heard music you saw an explosion of colour; or every time you ate cauliflower you tasted ‘purple’. For 4.4% of the population, this is their everyday reality. ‘Synaesthesia’ is a neurological phenomenon often described as a mixing of senses. It is vastly under-recognised due to the inherently personal nature of perceptual experience and often unreported because of the perceived stigma attached to reporting such experiences. For people with Colour-Grapheme Synaesthesia symbols, words and numbers (Graphemes) are perceived with the experience of colour, e.g. Synaesthesia. A very real problem for these individuals is one of perceptual conflict. This can be appreciated by all in the ‘Stroop effect’, whereby people are slower to name the colour of a word that is incongruent with the word form. Our study aims to simulate Colour-Grapheme synaesthetes’ perceptual experiences, by aligning font colour on a digital calculator to match ‘their’ colours. This offers a first potential therapy for synaesthesia by alleviating the perceptual conflict. We measure the participants’ speed and accuracy while using the calculator to complete maths problems, and we employ sensitive technologies to evaluate the participants’ emotional reactions from their facial expressions.
Cognitive dissonance was first described as psychological discomfort that results from cognitive inconsistency (Festinger, 1957). Revisionary explanations undermine the central role for this emotional reaction, citing other social or personal motivations for dissonance effects. However, reactions to simpler inconsistencies evoke dissonance-like discomfort (Harmon-Jones, Amodio, & Harmon-Jones, 2009). In the studies presented here, participants read neutral sentences that ended with unexpected or expected final words. Sentences with unexpected endings lead to negative emotional reactions as measured by self-report, implicit measure of affect, and facial EMG activity. These results support models of dissonance that argue the emotional reactions to inconsistencies are the cause of dissonance effects (Festinger, 1957; Harmon-Jones, Amodio, & Harmon-Jones, 2009). Implications and future tests of the action-based model of dissonance are discussed.
Are You Sure About That? Eliciting Confidence Ratings Improves Performance on Raven’s Progressive Matrices

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Confidence ratings (CR) have often been integrated into reasoning and intelligence tasks as a means for assessing metareasoning processes. Although it is often assumed that eliciting these judgements throughout reasoning tasks has no effect on the underlying performance outcomes, this is yet to be established empirically. The current study examines whether eliciting CR from participants during a fluid-reasoning task influences their performance and how this effect is moderated by their initial self-confidence in their own reasoning abilities. In a first experiment we found that participants performing CR during Raven’s Progressive Matrices significantly out-performed a control group who did not provide ratings. Additionally, a second experiment demonstrated that CR only facilitated performance in participants who have a high level of initial self-confidence in their reasoning ability, whereas they were detrimental to participants low in self-confidence.
Does Reading Direction Affect The Order Of Letter Encoding? Evidence From Bilingual Arabic/English Readers

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When two letters are briefly presented, participants from English-speaking populations are typically better at identifying the letter on the left. This is often attributed to a right-hemisphere advantage for selective attention. However, the left advantage might instead reflect the habitual reading of text from left to right. Here, we assess the role of reading direction by testing bilingual participants with experience reading Arabic, which runs from right to left. Using a pre-registered Bayesian data analysis, we find a large left-item advantage when participants are asked to report English stimuli, but no advantage when participants are asked to report Arabic. Our mixture-modelling technique reveals the letters were sampled at approximately the same time, ruling out the theory that the letter on one side was sampled first before a shift of attention to the other letter. Thus, the poorer performance on one side reflects the dynamics of a post-sampling bottleneck, with processing priority determined by reading order. Possibilities for the identity of the post-sampling bottleneck process include tokenisation and memory consolidation.
STREAM TWO – SESSION FOUR


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The current study utilises hypnosis to investigate two fundamental cognitive mechanisms, within the cognitive science of religion, and their theorised by-products, The Hyperactive Agency Detection Device (HADD), and Theory of Mind (ToM), within an ecologically sound setting. Previous empirical literature examining the HADD and ToM is limited, and lacks real-world stimuli. Hypnosis has been previously demonstrated to be an effective way to model alterations in belief formation within a variety of different cognitive phenomena. A hypnotic suggestion and an intentional agency video prime were given in order to model hyperactive agency detection and to prime participants’ agency attribution and agency intention. The sample comprised of 42 participants (23 high hypnotisable; 19 low hypnotisable), with each hypnotisability group split into a prime or no prime condition. Results suggest hypnotisability played a key role in participants’ agency detection and agency attribution responses, however the video prime had no effect on participants’ agency detection or agency attributions. Overall findings support the Hyperactive Agency Detection Device as an intrinsic cognitive mechanism, however, suggests it has multidimensional capacities. Furthermore, support was found for anthropomorphic tendencies and supernatural agency attribution as potential by-products of the HADD and ToM.