Forum Meeting – Abstracts

Selective Attention and Individual Differences in Motivation and Emotion

Wednesday, 19th April, 12-5 pm

The intersection between culture and emotion: Tracking how cultural factors shape threat perception and memory processes
Belinda Liddell

Cultures differ substantially, especially in regards to the conceptualization of the self. There is a growing body of research that shows that differences in this self-representation significantly modulates perceptual, attention, and cognitive processes. Yet, much of this research has been conducted outside the emotional realm. This talk will present on a number of studies conducted at the School of Psychology UNSW investigating how self-representation differences in individualism and collectivism biases attention, perception and memory of emotional cues, and shapes the underlying neural correlates of these processes. Discussion points will include operationalizing culture, considering beyond the individualism-collectivism dichotomy, and challenging the assumption that threat processes operate according to universal principles.

Seeing red when angry
Taatsha Sivananthan and Kim Curby

Colour, an integral aspect of vision, has been suggested to influence and be influenced by contextual factors such as emotion (Elliot & Maier, 2012). Colour-in-context, a recent theory on this interaction between colour and context has formulated a series of six premises (Elliot & Maier, 2012). The current study investigates premise 5 which suggests a reciprocal relationship between colour perception and affect. This study investigates the influence of affect on attention and memory for colour. We tested whether angry, happy and neutral face images presented immediately prior to a novel shape memory task influences attention and memory for shapes of a certain colour. We hypothesised that participants would have better attention and memory for shapes presented in a colour congruent to the perceived emotion (anger – red, happy – green). Participants were presented with a happy, angry or neutral face image and told to remember the identity and expression of the individual. Following this, participants were to remember an array of six novel shapes (3 red and 3 green). A single black shape was then presented and participants determined whether the shape was presented in the array. Participants were then presented with a face image and asked to determine whether the face was initially presented prior to the shape memory task.

Initial analysis didn't reveal any relationships between affect and colour memory. Post hoc analysis showed 2 distinct patterns in participants' strategy for remembering facial stimuli. Some participants reported mimicking facial expressions at the beginning of each trial, while other participants chose other strategies such as labelling the expression. Subsequent analysis showed an interaction between affect, colour and strategy used to remember the faces. Those participants that chose to mimic facial expressions, showed better shape memory accuracy for red shapes if they had been presented with angry faces, and green shapes if they had been presented with happy faces, which is consistent with the colour-in-context theory. In contrast, the non-mimic participants showed better shape memory for green shapes than red shapes if they had been presented with angry faces. This effect may, in part, be explained by the facial feedback hypothesis, which suggests movement in the facial muscles influence affect (Ekman, Levenson & Friesen, 1983). We are currently conducting studies to investigate this effect of strategies (mimicking) on affect and colour memory.

Understanding executive functions under stress: The role of emotion regulation
Vera E. Newman, Belinda J. Liddell and Steven B. Most

Stress is a pressing psychosocial issue, and an abundance of evidence indicates that stress significantly interferes with various areas of cognition, including decision-making and executive functions. Despite this research interest, the question remains – what can be done, if anything, to counter these detrimental effects of stress on performance? Our research is investigating the use of cognitive emotion regulation strategies during an acutely stressful experience, and how these strategies might affect physiological reactivity, subjective experience and later executive performance. Current findings suggest that the relationship between stress and executive functions may be dependent on individual differences including gender and dominant emotion regulation strategy. This raises the importance of understanding flexibility in emotion regulation, including in which contexts and for whom certain regulatory strategies might be adaptive or maladaptive.

The effect of reward on implicit learning of gaze-contingent events
Tom Beesley, Steve Most, Daniel Pearson, Debdutta Misra and Mike Le Pelley

In a recent experiment, Beesley, Pearson, and Le Pelley (2015) showed that naïve participants could learn a contingency between the focus of their attention (fixation) and an upcoming event: when participants looked at region X, event Y occurred, and they demonstrated a facilitation in their responding to event Y. Furthermore, this effect was demonstrated even in those participants who seemingly had no awareness of the contingency. The current experiment explored whether this implicit learning effect could be modulated by the emotional significance of the event (i.e., how rewarding it is)? One might imagine that simple contingency learning of this kind might be impervious to such high-level features of the task. Our results suggest, in fact, that the value of the event played a significant role in modulating the learning that took place.

The influence of body posture on social cognitive conflict: An event-related potential study
Eric Sun and Eddie Harmon-Jones

We have previously found that the processing of cognitive conflict is influenced by whole body posture, such that a supine body posture, associated with lower approach motivation, reduces the N450 magnitude in the Stroop task. The present study was designed to examine whether body posture would have an impact on more social cognitive conflict. Based on previous research that has found that some Caucasians showed exaggerated conflict processing that suggests they were prejudiced toward African Americans, we modified the weapon identification task used in the previous research so that it was suitable for measuring conflict of being prejudiced toward Muslims. The participants' body posture was manipulated (sitting upright vs. supine) while their brain potentials were measured. Behavioral results revealed that the response biases were found in both reaction times and error rates. Compared to the White faces, faster reaction times on correct gun trials preceded by the Muslim faces and higher error rates on tool trials preceded by the Muslim faces were found. In addition, the ERP results revealed that erroneous responses elicited larger negative deflections than correct responses, typical of error-related negativity (ERN). Moreover, the ERN magnitude of White-Gun errors was smaller in the supine posture than in the sitting upright posture. In contrast, the Muslim-Tool ERN, the neural detection of prejudiced errors, was not modulated by body posture. Implications for prejudice, motivation, and self-regulation were further discussed.

Are popular posed "emotion" stimuli good enough for research?
Amy Dawel, Luke Wright, Jessica Irons, Rachael Dumbleton, Romina Palermo, Richard O'Kearney and Elinor McKone

Despite the longstanding interest in how people perceive others' *emotions* from facial expressions, much of the empirical data comes from a small number of artificially posed stimuli (e.g., the Ekman faces), which were validated only by high levels of agreement about *what* emotion they are showing (e.g., labeled as angry, happy sad, etc.). This ignores a separate —and potentially critical— dimension of facial expressions: whether or not they are perceived as showing actual genuine emotion. In this talk, I will present the first evidence establishing that many popular posed stimuli, including those from Ekman, are perceived as *not* showing genuine emotion. I will then demonstrate it is possible to obtain facial expressions that are reliably perceived as genuine, and describe the development of two new sets of stimuli: one elicited by emotional events and perceived as showing genuine emotion, and the other elicited by posing and perceived as *not* showing genuine emotion. Finally, and most importantly, I will show that using genuine instead of posed expressions can make a real difference to research outcomes.

Rewarding outcomes can influence both attentional capture and suppression
Daniel Pearson and Mike Le Pelley

Pairing a stimulus with a highly rewarding outcome increases the extent to which it will involuntarily capture attention, even when such capture results in the omission of the reward that would otherwise have been received. This *Value-Modulated Attentional Capture* (VMAC) effect demonstrates that stimuli with high motivational significance are more likely to be selected by the attentional system in involuntary and sometimes counterproductive ways. We have demonstrated that this effect is immune to volitional cognitive control, in that participants are unable to reverse or reduce the effect when they are given full instructions about the omission contingency embedded in the task. However, recent evidence suggests that training on the task allows participants to dampen the VMAC effect, without reversing it completely. This suggests that reward can have an opposing influence on attentional capture and suppression processes.

A closer look at the repetition assumption in training selective attention
Enrique Mergelsberg, Ottmar Lipp and Patrick Clarke

Background. The cue-validity effect, the shortening of RT to targets presented in pre-cued locations in simple reaction time (RT) tasks has been suggested to reflect on attentional processes. Hence, these tasks have been modified in order to measure and train selective attention. *Methodology*. Three studies were conducted to modify covert selective visual attention using different visual probe tasks and conditions. In these experiments, a simple RT task, the basic Dot-probe task (DPT) with two neutral stimuli, was slightly altered to determine the effect of cue-validity on RT performance. In experiment 1, a probe discrimination task was administered in two predictive blocks of 95% valid cue trials surrounded by three non-predictive test blocks with 50% cue validity. Experiment 2 employed the same basic procedure, but omitted the first test block to assess the influence of pre-exposure to a set of non-predictive trials. In experiment 3, the task was changed from a probe-discrimination to a probe-location task that required either location matched or location non-matched responses. *Results*. A significant cuing effect emerged only in the location non-matched condition of the probe-location task used in Experiment 3, however, this effect did not transfer to the non-predictive test block. *Conclusion*. The current results suggest that biasing the cue validity was not sufficient to affect performance in a simple DPT using a probe-discrimination task. Such a result emerged in a probe-location task that

required location non-matched responses, however, this effect was transient and did not transfer to a non-biased test condition.

Attentional control predicts change in bias in response to attentional bias modification
Patrick Clarke

Procedures that effectively modify attentional bias to negative information have demonstrated the potential to be an effective source of therapeutic change in emotional vulnerability. However, the degree to which these procedures modify attentional bias is subject to individual differences. This generates the need to understand the mechanisms that influence attentional bias change across individuals. The present study investigated the association between individual differences in attentional control and individual differences in the magnitude of bias change evoked by an attentional bias modification procedure. The findings demonstrate that individual differences in two facets of attentional control, control of attentional inhibition and control of attentional selectivity, positively predicted individual differences in the magnitude of attentional bias change. The present findings inform upon the cognitive mechanisms underpinning change in attentional bias, and identify a target cognitive process for research seeking to enhance the therapeutic effectiveness of attentional bias modification procedures.

Attentional bias mediates the effect of tDCS on anxiety reactivity: Evidence from a dual-video stressor task
Nigel T M Chen, Julian Basanovic, Lies Notebaert, Colin MacLeod and Patrick J F Clarke

Transcranial direct current stimulation (tDCS) is a neuromodulatory technique which has garnered recent interest in the potential treatment for emotion-based psychopathology. While accumulating evidence suggests that tDCS may attenuate emotional vulnerability, critically, little is known about the underlying mechanisms of this effect. The present study examined the possibility that tDCS may affect emotional vulnerability via its capacity to modulate attentional bias towards negative information. Fifty healthy participants were randomly assigned to receive either anodal tDCS (2mA/min) stimulation to the left dorsolateral prefrontal cortex (DLPFC), or sham. Participants were then eye tracked during a dual-video stressor task designed to elicit emotional reactivity, while providing a concurrent in-vivo measure of attentional bias. Greater attentional bias towards negative information was associated with greater emotional reactivity to the stressor task. Furthermore, the active tDCS group showed reduced attentional bias to negative information, compared to the sham group. Importantly, negative attentional bias was found to mediate the effect of tDCS on emotional reactivity, while no direct effect of tDCS on emotional reactivity was observed. The findings suggest that the effect of tDCS on emotional vulnerability may be mediated by changes in negative attentional bias, holding implications for the application of tDCS in emotion-based psychopathology.

Targeting implicit cognitions to reduce young adults' binge-drinking: Trial of an online intervention
Melanie White

This presentation describes a current study of an online administration of an attention bias modification (ABM) protocol to reduce hazardous drinking in young adults. It builds on previous development work using a single lab-based session of ABM (targeting alcohol-related expectancies) which found promising significant effects on alcohol-related attentional biases, craving and self-reported binge drinking behaviour at follow-up. However, ABM evidence from

other fields supports the need for multiple sessions of administration (with a move to more flexible modes of delivery) and to examine delayed and sustained effects. Thus, the current study examines the effectiveness of online administration of 5 sessions of this ABM at modifying implicit alcohol-related cognitive biases and reducing binge drinking behaviour in a sample of young adult binge drinkers both immediately post-treatment and at 1-month follow-up. The use of mobile breathalysers and genetic sampling in this study will also be discussed.

Examining moderators of uptake and effects of attentional bias modification for chronic pain

Julie Vermeir, Melanie White and Daniel Johnson)

Chronic pain affects 1 in 5 Australian adults and has been found to have a negative effect on psychological and social well-being. Current treatments are often insufficient in reducing pain and associated health outcomes. Preliminary research has found that attentional retraining techniques such as Attentional Bias Modification (ABM) can be effective in the management of chronic pain. Findings from my Honours research found support for the efficacy of a 3-session lab-delivered ABM in reducing pain intensity and pain interference. However, ABM is a repetitive, monotonous task that can lead to disengagement, frustration and high dropout rates. Moreover, the chronic pain experience may limit ability or willingness to attend in-person appointments to receive the intervention. My PhD will extend on my Honours study by creating a gamified web-delivered chronic pain ABM that aims to improve engagement and increase motivation to complete multiple sessions of the training, and to examine individual differences that may moderate the effects of the ABM.