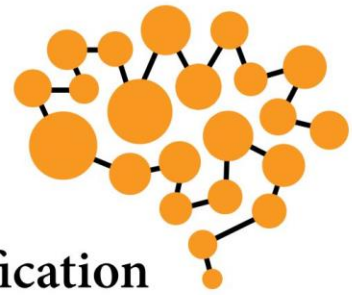


ACBM

Association for Cognitive Bias Modification



21-23 JULY 2024

**The 3rd annual
conference of the
Association for Cognitive
Bias Modification (ACBM)**



Abstract book

Association for Cognitive Bias Modification

3rd Annual Meeting – London 21-23rd July 2024

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FROM BIAS TO BIAS MODIFICATION IN DEPRESSION

Session type: **Keynote lecture**

Time: Sunday, July 21st; 13.30-14.30

Location: Arts Two: Lecture Theatre

Speaker: **Eni Becker**, Radboud University

Major Depressive Disorder (MDD) stands out as one of the most prevalent mental disorders, inflicting significant costs and anguish upon both patients and their families. Although treatable, MDD often manifests as a chronic condition marked by frequent relapses, underscoring the need to improve and augment existing depression interventions. Numerous studies highlight the pivotal role of systematic biases in information processing in the genesis and maintenance of depression. While Cognitive Bias Modification (CBM) programs have been developed to address depression, their impact on depressive symptoms remains inconclusive. This ambiguity may stem from the predominant focus of previous CBM studies on modifying attention and interpretation processes, with less emphasis on training other cognitive functions. There might be a mismatch of bias and bias modification. This imbalance in addressing various cognitive biases and their modifications could account for mixed results in CBM's effectiveness. This presentation aims to provide a comprehensive overview of diverse approaches to depression intervention, including unconventional methods. Notably, these encompass CBM interventions targeting action tendencies, where patients are trained to approach positive stimuli, as well as interventions designed to enhance different facets of memory. The talk will delve into the specifics of these interventions, offering illustrative examples of their application and summarizing pertinent studies evaluating their impact on depression. Additionally, the presentation will spotlight common challenges encountered in this area of research and delineate potential future directions for advancing the field.

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REWARD LEARNING FROM AN ATTENTIONAL PERSPECTIVE
Session type: Symposium
Time: Sunday, July 21st; 14.40-16.00
Location: Arts Two: Lecture Theatre
Chair: Amit Lazarov , Tel Aviv University
<p>Much research has been devoted to exploring aberrant learning processes, both deficient and heightened, across different psychopathologies, including reward-based learning as well as learning based on negative reinforcement/punishment. As attention precedes behavior and guides thought and higher-order cognitive processes, learning from an attentional perspective seems vital to further enhance our understanding of subsequent stages of learning. In this symposium, we will present four research efforts exploring aberrant attentional learning in different psychopathologies implementing different experimental methodologies. The first talk will present a study exploring the effects of reward-based attention learning on subsequent attention allocation in depression using a novel gaze-contingent music reward paradigm in which rewarding music is used to train participants' attention allocation in a specific direction (to one type of stimuli over the other). The second talk will present a follow-up study exploring the effects of negative reinforcement-based attentional learning on subsequent attention allocation in depression using the same gaze-contingent learning paradigm while substituting the appetitive music reward with the removal of an aversive sound (i.e., white noise). The third talk will present research exploring the attentional aspect of reward learning in participants with obsessive-compulsive disorder (OCD) using an eye-tracking-based version of the value modulated attentional capture (VMAC) task. Finally, the fourth talk will present research using the VMAC task to explore reward and a novel Pirates and Planets task to explore punishment sensitivity as orthogonal risk factors for psychopathology, focusing mainly on addictive behavior.</p>
Aberrant reward learning in depression – An attentional perspective
Presenter: Amit Lazarov , Tel Aviv University
<p>Objective: Depression has been associated with dysregulation of the reward system using a wide range of cognitive, neurological, and behavioural tasks. Yet, reward learning from an attentional perspective, namely, the effects of reward-learning on subsequent attention processes (also known as reward-based Selection History) has been mostly overlooked. The only two studies to date to explore reward-based selection history in depression showed depressive symptoms to be associated with reduced attentional capture by previously rewarded stimuli. However, these studies used reaction-time-based measures of attention, a “secondary” monetary reward, and a task with explicit demands from participants.</p> <p>Method: In the present study we used an eye-tracking-based attention task with no specific demands of participants, an eye-tracking-based attention allocation measure, and music as a reward. Specifically, participants with high and low levels of depression were trained to divert their gaze toward one type of stimuli over another (two types of neutral geometrical shapes) using a gaze-contingent music reward paradigm – music played when fixating the desired stimulus type and stopped when gazing the alternate one. Attention allocation, quantified as percent of time spent on the rewarded stimulus type, was assessed before, during, and following training.</p> <p>Results: While both groups showed identical reward learning during training, only low depressed participants showed an attentional bias towards value-imbued stimuli at post-training, reflecting (near) transfer of learning.</p> <p>Conclusion: Depression may be associated with a decreased sensitivity of the attentional system to previously learned reward information, which may help explain clinical characteristics of depression, and specifically anhedonia.</p>

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Intact negative reinforcement learning in depression - an attentional perspective

Presenter: **Nimrod Hertz-Palmor**, Cambridge University

Objective:

Aberrant reward learning is implicated in depression. Recently, we have shown that this also includes the realm of attention, showing reduced effects of attentional reward learning on subsequent attention allocation (i.e., aberrant reward-based selection history). This study explored whether similar findings would emerge when using negative reinforcement rather than reward learning in depression.

Method:

Individuals presenting high and low levels of depressive symptoms (HD and LD groups, respectively) underwent an eye tracking-based attentional learning task, reinforcing attention to one type of stimuli (i.e., the target stimuli) over another, by associating it with the removal of an aversive sound. Attention allocation, quantified as percent of time spent on the target stimulus type, was assessed before, during, and following the learning task.

Results:

Both HD and LD groups showed effective learning as well as post-training generalization. Results maintained when introducing anxiety as a covariate, and when using a more powerful sensitivity analysis. HD participants learned faster than LD participants during the initial learning phase. An exploratory analysis of learning trajectories revealed three learning types across groups – fast, slow and non-learners.

Conclusion:

Learning generalization is intact in depression when learning by negative reinforcement. This differs from established deficiencies in reward learning demonstrated in depression through previous attentional research.

Reward Functioning from an Attentional Perspective and Obsessive-Compulsive Disorder – An Eye-tracking Study

Presenter: **Dana Basel**, Tel Aviv University

Objective: Recently, a novel approach to obsessive-compulsive disorder (OCD) has emerged, implicating altered reward functioning in the disorder. Yet, no study to date has directly examined the attentional aspect of reward functioning in participants with OCD, with past research mostly relying on reaction-time-based tasks.

Method: A reward-based value modulated attentional capture task was completed twice: first by a sample of non-clinical students with high (HOC) and with low (LOC) levels of obsessive-compulsive (OC) symptoms (study 1), and then by clinically diagnosed OCD participants, clinically diagnosed anxiety disorders participants (AN) and healthy individuals (HC, study 2). We measured the extent to which high and low reward-signalling distractors captured attention and impaired performance on the task, resulting in a lower possibility of obtaining a monetary reward. Attentional capture was indexed via fixation data, and further explored using saccade data.

Results: In study 1, both groups performed more poorly when a high-reward signaling distractor was present, compared to when a low-reward signalling distractor was present (the "VMAC effect"). Importantly, this effect was significantly greater in the HOC group, and was found to be driven by the specific effects of reward-signalling distractors, both for fixations and saccade data. Similarly, in study 2, OCD participants showed a greater VMAC effect than HC participants. Interestingly, the AN group showed a blunted VMAC effect.

Conclusion: Current findings suggest that aberrant reward-based attention learning may be associated with OCD. Different aspects of reward functioning, including attention, should be further explored and incorporated in future research and clinical endeavors.

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Reward and Punishment Sensitivity as Risk Factors of Substance Use and Related Disorders

Presenter: **Reinout Wiers**, University of Amsterdam

Objective:

While reward and punishment sensitivity have been studied as risk factors for addictions, previous work relied primarily on self-reported measures. Here we aim to study reward and punishment sensitivity, their persistence and their relationship to alcohol use and related disorders, using two behavioral tasks; the Value-modulated attentional capture (VMAC) and Pirates and Planets (PP) tasks.

Method:

Student participants will complete an online task (VMAC) to assess reward sensitivity effects on attention, including its persistence after contingency reversal. They will also complete the conditioned punishment task (PP) during which they implicitly learn response-punishment contingencies. Prior to the last two blocks, participants will be informed explicitly of the contingencies, allowing us to measure punishment-related persistence despite explicit knowledge (previously reported). We will measure alcohol and compulsivity-related problems using standard self-report questionnaires.

Results:

Data collection is in progress. We will present first results. We expect to find that both greater reward sensitivity, and greater punishment insensitivity are associated with greater alcohol use, and we expect these two risk factors to be orthogonal. We further hypothesize that greater persistence of both risk factors will be associated with both greater alcohol use as well as greater compulsivity-related problems.

Conclusion:

With this study we aim to describe the extent to which these risk factors are independent (orthogonal), whether their assessment is reliable, and whether the scores on the tasks predict the development of addictive and related behaviors.

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PAINFUL OR BENIGN? THE ROLE OF COGNITIVE BIAS MODIFICATION IN MANAGING PAIN

Session type: **Keynote lecture**

Time: Monday, July 22nd; 09.15-10.15

Location: Arts Two: Lecture Theatre

Speaker: **Louise Sharpe**, The University of Sydney

The role of cognitive biases in pain has been explored over the past 20 years. While early research focused largely on attentional biases and attempted to modify these with mixed success, more recent research has focused more on interpretation biases. Whereas evidence for attentional biases in pain suggests that these attentional biases are small and unrelated to theoretically important constructs, there is strong evidence for robust and consistent interpretation biases in people experiencing a range of painful conditions. This has given rise to interest in modifying interpretation biases to improve pain outcomes. To date, there are only three randomized controlled trials of Cognitive Bias Modification for Interpretation (CBM-I) in pain. Evidence supports the efficacy of CBM-I on pain severity and pain interference in people with a range of chronic pain conditions. In addition, CBM-I reduced pain-related fear. CBM-I also proved to be efficacious in people with cancer, not only reducing fear of cancer recurrence, but also pain severity and interference. Interestingly, there was no difference between two types of CBM-I based that targeted either pain-related or cancer-specific interpretations. Based on these results, the potential role of CBM-I as a part of stepped care approaches will be discussed.

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COGNITIVE BIAS MODIFICATION – INTERPRETATION: FROM EXPERIMENTAL LAB TO CLINICALLY APPLIED STUDIES

Session type: **Symposium**

Time: Monday, July 22nd; 10.30-11.50

Location: Arts Two: Lecture Theatre

Chair: **Beray Macit & Marius Kunna**, Ruhr University Bochum

This symposium brings together four studies examining the efficacy and mechanisms of Cognitive Bias Modification (CBM-I) and mental imagery interventions for anxiety and depression across different populations and symptom-severity levels. The study by Marius Kunna investigated the impact of CBM-I on social anxiety-related interpretation biases, revealing training-congruent changes in interpretation processes. Transfer effects to stress reactivity markers showed a heterogeneous pattern, indicating the need for further refined follow-up research. The training study by Marcella L. Woud examined the effects of generating positive mental images versus generating positive verbal thoughts on anhedonia. Results indicate that mental imagery leads to greater reductions in anhedonia than sentence generation, highlighting the significance of imagery in alleviating anhedonia. The randomized controlled trial by Beray Macit investigated the potential augmentation of exposure therapy for acrophobia by CBM-I. Although CBM-I yields promising results in reducing interpretation bias, it lacks transfer effects to behavioral markers. These findings highlight the complexity of cognitive mechanisms in exposure therapy. The study by Vera Bouwman explores dynamic predictors of exposure therapy outcomes for fear of public speaking. Results show that maintaining positive interpretation changes after CBM-I predicts greater fear reduction in public speaking following exposure therapy. These findings provide valuable insights for predicting treatment outcome. Overall, these studies contribute to our understanding of the mechanisms underlying cognitive training interventions and their potential to improve existing treatments. The results further emphasize the role of individual differences and support examining dynamic processes in predicting treatment outcomes.

Effects of Cognitive Bias Modification on Interpretation Bias and Stress Reactivity in the Context of Social Anxiety

Presenter: **Marius Kunna**, Ruhr University Bochum

Objective: Cognitive-behavioral models of emotional psychopathology postulate that interpretation biases (IBs) are causally involved in the etiology of anxiety disorders. Additionally, IBs are supposed to affect an individual's vulnerability to stress. Prior research has demonstrated that IBs are malleable via Cognitive Bias Modification-Interpretation (CBM-I) and that such trainings can reduce anxiety symptoms. As of yet, however, the underlying mechanisms of CBM-I are not well understood, and transfer effects to self-reported and psychophysiological stress reactivity markers (SRM; i.e., heart rate [variability] and cortisol), are inconsistent.

Method: Currently, N=87 participants with subclinical social anxiety were randomized to one of three single-session CBM-I conditions (i.e., positive, negative, neutral) using the Ambiguous Scenario Task. IBs were assessed pre- and post-training, SRM (self-reported and psychophysiological) were assessed pre-post an stress-inducing anagram task.

Results: Data collection will be completed in May 2024 (target N=145) and results of all outcome variables will be presented during the talk. Preliminary results show training-congruent within-group changes in interpretation biases. Post-hoc between-group tests indicate that at post-assessment, interpretations differed between the negative and neutral and the negative and positive, but not between the positive and neutral conditions. In self-

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reported SRM, only a main effect of time was found, indicating a general increase in stress pre-post-stressor, irrespective of training condition.

Conclusion: Preliminary results seem in line with previous findings on CBM-I effects on interpretational processes. However, at the present moment, transfer effects to SRM are inconclusive. The study's results may inform both etiological frameworks and mechanisms underlying CBM-I.

The Effect of Positive Mental Imagery versus Positive Verbal Thoughts on Anhedonia

Presenter: **Marcella L. Woud**, The University of Göttingen

Objective: Anhedonia, the loss of interest in and pleasure from previously enjoyable activities, is a core symptom of depression and presents a major challenge to treatments. Interventions involving positive mental imagery generation have been suggested to reduce anhedonia. However, it is not clear whether the imagery component of such interventions is crucial for these effects. The current study aimed to test this by contrasting repeated generation of positive mental imagery versus positive verbal thoughts.

Method: Over a one-week period, 53 mildly anhedonic adults completed 5 sessions of a computerized training program involving generation of either positive images or positive sentences.

Results: Results showed that participants who generated imagery showed greater improvements in anhedonia (measured via the Dimensional Anhedonia Rating Scale) from pre-to post-training than participants who generated sentences. Other measures generally showed a similar pattern of results, albeit in most cases without statistically significant between-group differences.

Conclusion: The present study supports the proposal that positive imagery could provide a route to improve anhedonia, and that generation of imagery in particular (as opposed to positive thoughts in general) is an important driving mechanism for these effects. This has both theoretical and clinical implications for understanding the role of imagery in anhedonia and its treatment.

Heightened Expectations: CBM-I and Its Implications for Acrophobia Treatment

Presenter: **Beray Macit**, Ruhr University Bochum

Objective: This study aimed to enhance exposure therapy efficacy for acrophobia by investigating the potential augmentation through Cognitive Bias Modification-Interpretation (CBM-I) training compared to sham training.

Method: Data from a randomized controlled trial (NCT05780203) involving acrophobic patients (N=80) will be presented. One week after a baseline assessment, patients received a one-session exposure therapy. The next day, patients were randomized to receive either CBM-I training (N = 40) or sham training (N = 40), followed by a post-assessment. One month later, patients completed a follow-up assessment. During all assessments, interpretational processing was measured via the Encoding Recognition Task (ERT) and the Heights Interpretation Questionnaire (HIQ); anxiety-relevant behavior was assessed via a Behavioral Approach Test (BAT).

Results: In intention-to-treat analyses, patients receiving CBM-I showed greater reductions in interpretational processing biases on the ERT from baseline to post-training compared to those receiving sham training (primary outcome). However, no such between-group difference in change was found from baseline to follow-up. Regarding the HIQ and BAT, no between-group changes were found, neither from baseline to post-assessment, nor from baseline to follow-up.

Conclusion: While CBM-I training, in combination with exposure, demonstrated the potential to reduce interpretational processing biases assessed via the ERT, no transfer to another cognitive task or a behavioral task was observed. These findings could contribute to a more

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fine-grained understanding of the cognitive mechanisms in exposure therapy for acrophobia and highlight the need for further research in the context of exposure-based treatments.

Change after CBM-I Training as Dynamic Predictor of Exposure Therapy Outcome in Fear of Public Speaking

Presenter: **Vera Bouwman**, Utrecht University

Objective: Cognitive Behavioral Therapy is the recommended treatment for anxiety disorders. However, not everyone benefits (Loerinc et al., 2015). Despite efforts, no consistent predictors of treatment outcome have been identified. The current study focusses innovatively on a dynamic predictor. Namely, how long someone holds on to a change in interpretations following a short Cognitive Bias Modification Training for Interpretations (CBM-I). Single session CBM-I is expected to temporarily change interpretations into the positive direction and repeated measures can show how long someone benefits from this 'push in the right direction'. Based on the Dynamic Systems theory, it is expected that individuals who hold on longer to positive interpretations following CBM-I, show more positive change in subsequent anxiety treatment.

Method: Female participants (N = 100, M age = 23.13, SD = 3.89) with subclinical public speaking anxiety were randomly allocated to positive CBM-I (n = 50) or to a control condition (n = 50). Dynamic changes in interpretations were measured using Experience Sampling Method. Later, participants followed an online one-session exposure therapy for public speaking anxiety.

Results: Interpretations became more positive after CBM-I compared to the control condition. Public speaking anxiety was significantly lower after exposure. Interestingly, individuals who hold on longer to a change in interpretations after CBM-I, showed bigger reduction in public speaking anxiety after exposure.

Conclusion: Results indicate that how long someone benefits from a 'push in the right direction' is predictive of treatment outcome in anxiety. This study innovatively used CBM-I and momentary assessments to predict treatment outcome.

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MEMORY BIAS AS TARGET FOR MENTAL HEALTH ENHANCEMENT
Session type: Symposium
Time: Monday, July 22 nd ; 10.30-11.50
Location: Bancroft: 1.13 classroom
Chair: Iliana Liakea , Radboud University
<p>This symposium brings together cutting-edge research on memory bias and puts forward implications for mental health across diverse populations. It will showcase studies delving into various facets of memory biases. The first presenter will present research findings regarding the predictive capacity of cognitive biases in depression and anxiety, highlighting the significance of interpretation and memory biases as key indicators. The second presenter will discuss findings on the predictive value of memory biases in resilience among individuals with and without mental disorders, exploring the potential of memory bias assessment as a preventive strategy. Additionally, the third presenter will delve into the cognitive mechanisms underlying the mental health benefits of physical activity, with a focus on emotional memory bias. These presentations will be synthesized and further discussed by the discussant. The symposium will feature methodological innovations in the field of cognitive biases, along with actionable insights that bridge theoretical frameworks with practical applications in clinical and non-clinical contexts.</p>
Do cognitive biases predict anxiety and depression? A meta-analysis of longitudinal studies
Presenter: Jonas Everaert , Tilburg University & KU Leuven
<p>Objective. Cognitive biases have been implicated in the etiology and maintenance of depression and anxiety, yet their utility in predicting future symptoms of these mental disorders remains debated. This meta-analysis aimed to estimate the overall effect size of their predictive effects and to identify moderators relevant to theory and methodology. Method. Searches of PsycINFO, Web of Science, PubMed, PsyArXiv Preprints, and ProQuest Dissertations yielded 60 studies with 479 contrasts and 14,397 participants. The effect sizes calculated were standardized regression coefficients, where the effect of the predictor at Time 1 on the outcome at Time 2 is controlled for the Time 1 level of the outcome. Results. Results from a three-level meta-analysis was revealed a small overall effect size ($\beta=0.04$, 95%-CI [0.01, 0.07], $p=.006$) and significant between- and within-study variance. Equivalent effect sizes for the predictive utility of cognitive biases were found in minors and adults, for increased negative bias and reduced positive bias, and for predicting anxiety and depression outcomes. The magnitude of the overall effect was moderated by the cognitive process, with significant effect sizes for interpretation bias ($\beta=0.07$, $SE=0.01$, $p<.001$) and memory bias ($\beta=0.12$, $SE=0.03$, $p=.017$) but not attention bias ($\beta=-0.01$, $SE=0.01$, $p=.480$). Conclusion. These findings support the predictive role of cognitive biases in anxiety and depression, with interpretation and memory biases emerging as key markers. These findings have implications for cognitive theories of depression and anxiety as well as clinical interventions.</p>
The power of rosy retrospection: Positive memory bias as transdiagnostic predictor for resilience
Presenter: Sophie Bögemann , Radboud University Medical Center
<p>Objective. Research highlights the impact of cognitive biases on resilience. Understanding how bias contributes to resilience, especially in mentally vulnerable individuals, can aid the development of therapeutic interventions. In this context, Parsons, Kruijt, and Fox (2016) conceptualized resilience as the adaptive application of cognitive processes in the face of adversity. Booth and colleagues (2020) identified positive memory bias as the key predictor of resilience among healthy adolescents, prompting further research into clinical populations.</p>

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Method. We investigated the predictive value of positive memory bias on resilience in individuals with a history of stress-related and/or neurodevelopment mental disorders, supplemented with a never-disordered control group. Memory bias was assessed with the self-referent encoding task at baseline, as well as at three monthly follow-ups (Derry & Kuiper, 1981; Hammen & Zupan, 198). Resilience was assessed during the follow-ups and was operationalized by the individual's deviation from the sample's normative relationship between stressor exposure and mental health problems (cf. Kalisch et al., 2021).

Results. In individuals with a history of mental disorders – but not the healthy never-disorder individuals - memory bias predicted resilience on the shorter (4 weeks) but not the longer term (6 months to 4 years). This implies that the employed memory bias task might not be sensitive enough to capture memory bias differences nor correlates in healthy individuals.

Conclusion. Results may indicate that memory bias assessment may aid targeted tertiary prevention strategies after treatment completion. Additionally, future research should examine whether memory bias modification can enhance resilience, particularly in vulnerable populations.

Recent physical activity is associated with emotional memory and positive and negative affect in daily life

Presenter: **Michele Schmitter**, Radboud University & Propersona Depression Expertise Center

Objective. Compelling evidence shows that physical activity has a positive impact on mental health, yet the psychological mechanisms remain unclear. Emotional memories and repetitive negative thinking (RNT) are possible cognitive mechanisms behind the mental health benefits of physical activity. This study expands upon prior laboratory studies by examining how physical activity is associated with emotional memory and RNT in daily life, utilizing the experience sampling method (ESM).

Method. A community sample (N=112) was prompted four times a day for seven consecutive days to report on their recent physical activity duration and intensity, memory of a recent emotional event, RNT, and positive and negative affect.

Results. Participants appraised recent memories as more positive when they had been longer or more intensely physically active during the last few hours. The within-person association between physical activity duration/intensity and RNT (yes/no) was not significant, neither was the association with RNT level. In line with the mood-enhancing effect of physical activity, both physical activity duration and intensity were negatively associated with negative affect, and physical activity intensity was positively associated with positive affect.

Conclusion. The results indicate that physical activity is associated with more positive appraisal of past events, and is possibly the cognitive mechanism of physical activity. Future research is needed to further examine emotional memory as psychological mechanisms of physical activity.

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COGNITIVE BIASES IN CHILDREN AND YOUTH – ASSESSMENT AND MODIFICATION

Session type: **Individual Oral Presentations**

Time: Monday, July 22nd; 12.00-13.00

Location: Arts Two: Lecture Theatre

Chair: **Elske Salemink**, Utrecht University

Eye-tracking measurement of attention bias to social threat among youth: A replication and extension study

Presenter: **Meghan E. Byrne**, National Institute of Mental Health

Objective: Attentional bias to social threat cues has been linked to heightened negative affectivity symptoms among youth. Yet, inconsistent methodology has limited replication and led to mixed findings. The current study aims to 1) replicate and extend two previous pediatric studies demonstrating a relationship between negative affectivity and attentional bias to social threat and 2) examine the test-retest reliability of an eye-tracking paradigm among a subsample of youth. **Method:** Attention allocation to negative versus non-negative emotional faces was measured using a free-viewing eye-tracking task among transdiagnostic youth (N=185 total, 60% female, Mage=13.10 years, SDage=2.77). Replicating procedures of two previous studies, linear mixed-effects models compared attention bias between children with anxiety disorders and healthy controls. Bifactor analysis was used to parse shared versus unique facets of general negative affectivity (i.e., anxiety, irritability), which were examined in relation to attention bias. Test-retest reliability of the bias index was estimated among a subsample of youth (N=36). **Results:** No significant differences in attention allocation or bias emerged between the anxiety and healthy control groups. While general negative affectivity across the sample was not associated with attention bias, there was a positive relationship for anxiety and irritability on duration of attention allocation toward negative faces. Test-retest reliability for attention bias was acceptable ($r=0.50$, $p<.01$). **Conclusion:** While anxiety-related findings from the two previous studies were not replicated, the relationship between attention bias and facets of negative affect suggests a potential target for treatment. Evidence for test-retest reliability encourages future use of the eye-tracking task for researchers.

Youth attention control moderates the association between parent anxiety symptoms and youth attention bias to threat

Presenter: **Marissa Falcone**, Florida International University

Objective: Research suggests that parent anxiety symptoms are associated with youth attention to threat. Youth attention control processes may attenuate or exacerbate this association. In this study, we examined youth attention control (AC) and its components attention focusing (AF) and attention shifting (AS) as moderators of the association between parent anxiety and youth attention to threat. We expected parent anxiety to be associated with youth attention to threat at low but not high levels of AC. **Method:** Participants were 118 youth (ages 9-14 years, M = 11.71 years, SD = 1.75; 77.4% White, 72.2% Hispanic or Latino; 56.1% females assigned at birth) referred to an anxiety disorders specialty research clinic. We measured parent anxiety using the Depression Anxiety Stress Scales and attention control using the Attention Control Scale. We measured attention to threat using eye-tracking during a free viewing task of emotional faces. We quantified attention to threat as percent dwell time on threat stimuli, relative to non-threat. **Results:** Parent anxiety was significantly correlated with child attention to threat, $p = .009$. AF significantly moderated the association between parent anxiety and child attention to threat, $p = .006$, such that parent anxiety was positively associated with attention to threat when AF scores were low, but not high.

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Conclusion: High AF may buffer the effects of parent anxiety on youth attention to threat. These findings suggest a possible intervention target for children of parents with anxiety.

Social anxiety in adolescence: Biased interpretation of social pictures - Evaluation of a new task

Presenter: **Wolf-Gero Lange**, Radboud University

Prominent models of Social Anxiety Disorder (SAD) propose that negative interpretations of ambiguous social cues (Interpretation Biases [IBs]) might both perpetuate and potentially trigger the condition. Despite numerous tasks designed to evaluate IBs over the years, most rely on textual descriptions of ambiguous scenarios (vignettes), although social situations are predominantly visual. This discrepancy led us to develop a supposedly more ecologically valid and visually engaging version, particularly for adolescence. This is a phase of one's life when SAD often emerges.

In our picture task, participants viewed ambiguous social images followed by positive, neutral and negative interpretations. We aimed to investigate how this new task correlates with a conventional vignette task and how it relates to adolescents' social fears. Our sample comprised 329 adolescents aged 12 to 18 years. IBs were evaluated using both the newly devised pictorial task and traditional textual vignettes, while social fears were assessed through self-report questionnaires.

Findings indicate that the pictorial task effectively assessed IBs comparable to textual vignettes. Moreover, it pinpointed IBs in adolescents exhibiting heightened fear of negative evaluation, a hallmark symptom of social anxiety. However, it didn't discern IBs among adolescents with general social anxiety symptoms.

A randomised controlled trial of a co-designed online cognitive bias modification of interpretations for anxiety and depression in children

Presenter: **Gemma Sicouri**, University of New South Wales

Objective: Social anxiety disorder (SAD) is a common and debilitating condition, yet many individuals have difficulty accessing care or do not improve following treatment. Cognitive bias modification of interpretations (CBM-I) is an easily accessible treatment which could improve outcomes for individuals with SAD, however effects sizes for symptomatic improvement has been small. CBM-I's efficacy could be improved by tailoring content of the intervention to the disorder, known as content-specificity. The current study examined whether CBM-I was associated with better outcomes when the content was relevant to SAD (content-specific CBM-I) compared to when it was irrelevant (non-content-specific CBM-I).

Method: Participants (18-35 years old) with elevated social anxiety were randomised to either a single session of content-specific CBM-I (n = 55) or non-content-specific CBM-I (n = 55).

Outcomes were negative interpretation bias, social anxiety symptoms and state anxiety.

Results: The content-specific group had significantly greater reductions in negative interpretation bias and social interaction anxiety symptoms than the non-content-specific group. Contrary to hypotheses, the non-content specific group had significantly larger reduction in state anxiety than the content-specific group. There were no group differences for social observation anxiety.

Conclusion: The results indicated that CBM-I for SAD could be improved by matching the content of the intervention to the disorder. Future research should seek to replicate the results using multiple sessions and to consider the importance of tailoring CBM-I to individuals' specific anxiety disorder subtypes and biases.

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PAIN - COGNITIVE BIAS ASSESSMENT AND MODIFICATION
Session type: Individual Oral Presentations
Time: Monday, July 22 nd ; 12.00-13.00
Location: Bancroft: 1.13 classroom
Chair: Julian Basanovic , University of Exeter
Interpretation bias in endometriosis-related pain
Presenter: Brydee Pickup , University of Sydney
<p>Endometriosis is a chronic gynaecological condition affecting 1 in 9 people assigned female at birth. Models of chronic pain highlight the biased interpretation of ambiguous information as health threat related (interpretation bias) as an important process in the development and maintenance of chronic pain. Whether interpretation bias may also be similarly implicated in endometriosis-related pain is unclear. The current study aimed to address this gap in the literature by comparing interpretation biases between a sample of participants with endometriosis and a control sample of participants without medical conditions and pain, (2) exploring relationships between interpretation bias and endometriosis-related pain outcomes, and (3) exploring whether interpretation bias moderated the relationship between endometriosis-related pain severity and pain interference.</p> <p>The endometriosis and healthy control samples comprised 873 and 197 participants, respectively. Participants completed online surveys assessing demographics, interpretation bias, and pain-related outcomes.</p> <p>Analyses revealed that interpretation bias was significantly stronger among individuals with endometriosis relative to controls, with a large effect size. Within the endometriosis sample, interpretation bias was significantly associated with increases in pain-related interference, however, interpretation bias was not associated with any other pain outcomes and did not moderate the relationship between pain severity and pain interference.</p> <p>This study is the first to evidence biased interpretation styles among individuals with endometriosis and to show this bias is associated with pain interference. Whether interpretation bias varies over time and whether this bias can be modified through scalable and accessible interventions (CBM-I) to alleviate pain-related interference are avenues for future research.</p>
Investigating biased attention to cues signalling emotion-relevant information across depression, pain, and food craving
Presenter: Julian Basanovic , University of Exeter
<p>Objective: Recent research has demonstrated that biased attention to cues signalling future negative information characterises anxiety, and can be measured with acceptable reliability (Basanovic, 2024). This raises the question as to whether such biases are present in other individual difference domains believed to be characterised by biased responding to information. The present study explored this question across participants who varied in depression/anhedonia, pain, and food-craving/body-image.</p> <p>Method: Three studies were simultaneously conducted. Each study recruited participants who varied in self-reported depression (Study 1, N = 115), chronic pain (Study 2, N = 277, incl. 60 with chronic pain), or food-craving/body-image (Study 3, N = 101). Participants completed an assessment of selective attention to cues indicating the imminent future location of positive faces (Study 1), pained faces (Study 2), or unhealthy foods (Study 3).</p> <p>Results: Study 1 revealed that elevated depression was associated with attentional avoidance of cues signalling positive faces. Study 2 revealed that chronic pain did not influence attention to cues signalling pained faces, but for participants without chronic pain greater non-specific anxiety predicted greater attention to cues signalling pained faces. Study 3 revealed that unhealthy food craving predicted attention to cues signalling unhealthy foods.</p>

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The reliability of attentional bias indices across studies was moderate to high, $r[\text{split-half}] = .57$ to $.71$).

Conclusion: The findings further demonstrate that multiple individual difference domains are characterised by biased attention to signal of emotion-relevant information. Avenues for future research will be discussed.

Interpretation bias and its relationship with pain: A systematic review and meta-analysis

Presenter: **Brydee Pickup**, University of Sydney

Interpretation bias research has rapidly expanded since the Schoth and Lioffi (2016) review of interpretation bias in chronic pain. We aimed to provide an updated systematic review and meta-analysis of the evidence for interpretation bias in pain. Whether people experiencing pain showed a greater interpretation bias than people without pain, and whether interpretation bias was associated with pain outcomes were key questions. We also aimed to evaluate longitudinal and intervention research, which could inform interpretation bias as a causal mechanism and treatment target in pain.

Five databases were searched, resulting in the identification of 31 studies across 30 articles (combined $N = 4562$).

Fourteen studies compared interpretation bias in people with ($n = 1804$) and without ($n = 1061$) chronic pain or chronic illness featuring pain. People with chronic pain displayed a greater interpretation bias than people without pain, with a medium effect size ($g = 0.716$, $k = 14$, $p < .001$). This effect reached a large effect size when interpretation bias was assessed with the word association task ($g = 0.822$). Interpretation bias was associated with pain interference, pain catastrophising, and pain severity. Intervention studies ($k = 3$) showed that interpretation bias could be modified to bring about changes in experimental and chronic pain outcomes.

Interpretation bias appears relevant for pain interference and could represent a useful treatment target. High-quality longitudinal and intervention research is needed to further establish causality. Whether task-related factors could influence the ability to detect effects is another avenue for future research.

Unlocking pain relief: Insights from cognitive-emotional trainings and enhanced pain assessment

Presenter: **Einaiv Gozansky**, University of Haifa

Objective: Cognitive-emotional trainings for pain are suggested as promising interventions targeting core mechanisms related to pain. However, their efficacy varies partly due to varied research methodologies, diverse outcome measures, and individual differences in pain.

Thus, our research evaluated the ability to modulate experimental pain in healthy individuals by using two modified single-session trainings, through enhanced multimodality pain assessment.

Methods: Eighty participants completed two sessions of trainings in either active pain acceptance or attention bias modification (ABM) training. Participants arrived at one active session and one control session, in a random order. In each session, participants completed a battery of questionnaires, performed two tasks measuring attention bias toward pain, and underwent a comprehensive quantitative sensory testing (QST) assessment simultaneously with electrocardiogram (ECG) recording. Afterward, they completed one of the trainings and were again assessed using the QST.

Results: Preliminary results show that attention bias to pain at baseline predicted heart rate reactivity and recovery from heat pain stimuli. When comparing trainings efficacy, both active acceptance and ABM reduced sensitivity to suprathreshold pain stimuli; However, only acceptance training led to an increase in pain threshold. Furthermore, following acceptance training, vagal tone reactivity (as measured by HRV-RMSSD) during tonic heat pain increased, in correlation with the increase in cold water pain threshold.

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Conclusions: Both trainings effectively reduced experimental pain sensitivity, with acceptance training showing transferable effects to other pain modalities. Acceptance training pain effects are associated with increased vagal tone reactivity, suggesting this training modulates pain via the antinociceptive effect of the vagus.

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COGNITIVE BIAS MODIFICATION IN PROBLEMATIC SUBSTANCE USE
Session type: Symposium
Time: Monday, July 22 nd ; 14.00-15.20
Location: Arts Two: Lecture Theatre
Chair: Franziska Motka , Ludwig-Maximilians-University Munich
<p>Biases in the processing of substance-related stimuli have been shown to play a crucial role in the maintenance of problematic substance use. For instance, empirical research has found that individuals with problematic substance use exhibit biased attention and approach towards substance-related stimuli. In recent years, researchers have developed computer training programs, known as cognitive bias modification (CBM) training, to directly manipulate these biases. The reduction of cognitive biases is thought to have a neural working mechanism (e.g., reduced neural reward processing) and should lead to improved clinical outcomes (e.g., reduced relapse rates, substance use, or craving).</p> <p>This symposium provides an overview of the latest research on attention and approach bias modification training in problematic alcohol and tobacco use. The talks will present experimental studies that investigated a novel training program based on a dual probe task, used app-based and personalised approaches, and examined the effectiveness in a naturalistic setting. Additionally, the question of their potential neural working mechanism will be addressed.</p> <p>The symposium will cover the following topics: Personalised and smartphone-delivered approach bias modification training in outpatients with alcohol use disorder (Victoria Manning), (2) Approach bias modification training as add-on intervention in a naturalistic treatment setting for alcohol use disorders (Edwin Josef Schenkel), (3) Attention bias modification training based on a novel dual probe task to change drinking behaviour (Lana Mrkonja), and (4) Effects of approach bias modification training on neural cue-reactivity first-time in smoking (Franziska Motka).</p>
RCT of personalised smartphone-delivered approach bias modification in outpatients with alcohol use disorder
Presenter: Victoria Manning , Monash University
<p>Objective: While Approach Bias Modification (ApBM) during residential treatment for alcohol use disorder (AUD) is effective at preventing relapse, few studies have examined its effectiveness among outpatients. We tested the efficacy of personalised smartphone-delivered ApBM using "AAT-App" (Alcohol Avoidance Training App) on alcohol consumption in a sham-controlled pre-registered RCT (NCT05120856) with outpatients with AUD.</p> <p>Method: 79 participants receiving outpatient AUD treatment in Melbourne, Australia were randomly assigned to ApBM (N=39) or sham (N=40) training. ApBM participants personalised their alcohol (avoid) and positive (approach) training images, then were prompted to complete two weekly training sessions for 4 weeks. Sham-training involved a weekly approach bias assessment task. All participants reported number of standard drinks consumed on each day of the past week at baseline (week prior to training) and week 4 (final week of training).</p> <p>Results: For total past-week standard drinks, RMANOVA revealed a significant effect of time ($F=6.70$, $P=0.01$) indicating reduced consumption in both groups, but no group by time interaction ($F=0.10$, $P=.75$). For reductions in heavy drinking days (defined as ≥ 5 standard drinks), analyses showed a main effect of time indicating fewer heavy drinking days in both groups ($F=6.41$, $P=0.01$), but no group by time interaction ($F=0.08$, $P=.77$).</p> <p>Conclusion: Large (albeit non-significant) differences in baseline alcohol consumption between groups preclude a definitive assessment of ApBM's clinical efficacy, and the study was likely under-powered to detect group differences. Nonetheless, these findings provide no</p>

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indication that smartphone-delivered ApBM reduces alcohol consumption (quantity or frequency) any more than sham-training among AUD outpatients.

Implementing Approach-Bias Modification as Add-On to Varieties of Clinical Treatment for Alcohol Use Disorders: Results of a Multicenter RCT

Presenter: **Edwin Josef Schenkel**, Radboud University/Medizinische Hochschule Brandenburg Theodor Fontane/Salus Clinic Lindow

Objective: Abstinence rates after inpatient treatment for alcohol use disorder (AUD) are modest (1-year rate around 50%). One promising approach is to re-train the alcohol-approach-bias in AUD patients, as add-on to regular treatment. As efficacy has been demonstrated in well-controlled randomized controlled trials, the important next step is to add alcohol-approach-bias modification (alcohol-ApBM) to varieties of existing treatments for AUD. Therefore, this prospective, multicenter implementation-RCT examined whether adding alcohol-ApBM to regular treatments (various abstinence-oriented treatments including both individual and group-based interventions) would significantly increase abstinence rates compared to receiving regular treatment only, in a variety of naturalistic settings with different therapeutic approaches.

Methods: A total of 1,586 AUD inpatients from 9 German rehabilitation clinics were randomly assigned to receive either ApBM in addition to regular treatment or not. Training satisfaction of patients and therapists was measured after training. Success rates were determined at 3-, 6-, and 12-months post-treatment.

Results: Return rates of the post-treatment assessments varied greatly between clinics, often being low (18–76%). Nevertheless, ApBM significantly increased success rates after 3 months. After 6 and 12 months, the differences were not significant. ApBM was evaluated mostly positively by patients and therapists.

Conclusion: ApBM was an effective add-on to regular treatment of AUD at 3 months follow-up, across a variety of AUD treatment settings. However, low return rates for the clinical outcomes reduced the effect size of ApBM considerably. The application of ApBM proved feasible in varying clinical settings, offering the opportunity to modify automatic processes and to promote abstinence.

A First Evaluation of Dual Probe based Attentional Bias Modification to Change Drinking Behavior

Presenter: **Lana Mrkonja**, University of Amsterdam

Objective: Cognitive biases are believed to play a crucial role in addictions, and various tasks originally developed to assess a bias have been transformed into tools to manipulate the bias. However, the relatively weak psychometric properties of previous tasks prevented the reliable assessment of bias-change, and its mediation of treatment outcomes.

Methods: A new dual probe task has been developed with much better psychometric properties, which we successfully further adapted to show alcohol and soft drink advertisements (Wiechert et al, 2021). The current proof-of-principle pilot study evaluated a Cognitive Bias Modification version of this novel task, adapted to direct attention away from or towards alcohol ads, to change drinking behavior in a student population. We explore whether successful attention manipulation leads to changes in alcohol craving and immediate alcohol consumption in heavy and risky alcohol users.

Results: Preliminary findings indicate that the dual probe task successfully manipulated attention away from alcohol advertisements, which was further confirmed by eye-movement data. Furthermore, the results suggested substantial reductions in alcohol craving, and increases in soft drinks craving when attending away from alcohol stimuli. However, there were no significant effects on immediate alcohol consumption, which could be attributed to a low sample size of the first batch of data (data collection has been continued).

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Conclusions: These initial results suggest that the dual probe task could prove useful as an attentional bias modification intervention in Alcohol Use Disorder treatment, allowing for the test of mediational mechanisms.

The effects of approach bias modification on cue reactivity to smoking-related stimuli in smokers: a randomized controlled fMRI study

Presenter: **Franziska Motka**, Ludwig-Maximilians-University Munich

Objective: Persons who smoke exhibit altered neural cue-reactivity in response to smoking-related stimuli which is associated with success of smoking cessation. Moreover, smokers show automatic tendencies to approach smoking-related stimuli. Approach Bias Modification (AppBM) aims to retrain smoking approach biases. Functional magnetic resonance imaging (fMRI) studies have shown promising effects of AppBM on approach biases, which were associated with decreased cue-reactivity and improved clinical outcomes in abstinent alcohol-dependent patients. However, fMRI studies on smoking are currently lacking.

Method: N=98 chronic smokers absolved a fMRI smoking cue-reactivity task as part of a randomized-controlled study on the efficacy of adding AppBM to treatment-as-usual [TAU] in smoking cessation (German Trials Register, DRKS00019221). Participants were randomly assigned to either seven sessions of AppBM-, Sham-training, or TAU only. A region of interest (ROI) analysis was conducted in reward-related and visual processing areas to assess pre-post changes in cue-reactivity towards smoking versus neutral stimuli.

Results: No significant group×time interaction effects on smoking approach biases and cue-reactivity emerged. Changes in cue-reactivity were neither associated with changes in approach biases nor did they predict short- or long-term abstinence. Before intervention, no increased (or even reversed) cue-reactivity in visual processing and reward-related brain regions was observed, except for the anterior cingulate cortex.

Conclusion: Current results question the efficacy of AppBM in changing approach biases and cue-reactivity in smoking. Above, our findings suggest that smoking cue-reactivity may be influenced by sample characteristics (e.g., abstinence motivation) which should be addressed in future research.

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NEW DEVELOPMENTS IN ASSESSING INTERPRETATION BIASES IN PSYCHOPATHOLOGY

Session type: **Symposium**

Time: Monday, July 22nd; 14.00-15.20

Location: Bancroft: 1.13 classroom

Chair: **Sascha B. Duken**, Utrecht University

Biased interpretational processes may contribute to the onset and maintenance of mental disorders. To investigate the role of interpretation biases in the etiology and treatment of psychopathology, it is necessary to quantify differences in such biases across individuals and time. We discuss limitations of current approaches to measuring interpretation biases and present new developments that facilitate the assessment of interpretational processes in psychopathology. We present research that investigates fluctuations of interpretations over time, interpretations in a network of symptoms, and automatic dysfunctional appraisals in addition to conscious interpretations.

S. Duken discusses strengths and limitations of four interpretation bias measures ranging from implicit and automatic to explicit and reflective. He highlights poor psychometric properties of implicit measures and the need to develop refined ways to investigate interpretation biases. V. Bouwman introduces a new measure using ecological momentary assessments to investigate temporal dynamics of interpretations within anxious individuals. She presents results of a study that validates this measure that can be assessed several times per day. F. Dietel shows how interpretational processes can be conceptualized as part of a network of mutually reinforcing symptoms that underly psychopathology such as Body Dysmorphic Disorder. This network approach can simultaneously investigate the interrelations of a wide range of processes and symptoms, thereby facilitating holistic insights into cognitive biases that underlie mental disorders. Finally, C. Wittekind assessed dysfunctional appraisals with direct (questionnaire) and indirect (Implicit Association Test) measures in Posttraumatic Stress Disorder. She also investigated whether indirectly assessed interpretational biases change during trauma-focused treatment.

Reliability and validity of four cognitive interpretation bias measures in the context of social anxiety

Presenter: **Sascha B. Duken**, Utrecht University

Objective: People with social anxiety disorder tend to interpret ambiguous social information in a negative rather than positive manner. Such interpretation biases may cause and maintain anxiety symptoms. However, several studies did not find associations between interpretation biases and social anxiety. Psychometric properties of the tasks and questionnaires that measure interpretation biases could explain such inconsistent results. Therefore, we investigated the reliability and validity of four interpretation bias measures, ranging from implicit and automatic to explicit and reflective.

Method: We evaluated the internal consistency, test-retest reliability, convergent validity, and concurrent validity of four interpretation bias measures: Scenario Probe Task, Recognition Task, Scrambled Sentences Task, and Interpretation and Judgemental Bias Questionnaire.

Results: Psychometric properties of the Scenario Probe and the Recognition task were not acceptable. Psychometric properties of the Scrambled Sentences Task and the Interpretation and Judgemental Bias Questionnaire were good, and they correlated highly with social anxiety and each other.

Conclusion: The Scrambled Sentences Task and the Interpretation and Judgemental Bias Questionnaire are useful to investigate the role of interpretation biases in social anxiety. The Scenario Probe and the Recognition task should not be employed in their current form. We discuss likely reasons for their poor psychometric properties (e.g., the reliance on difference scores) and suggest potential solutions. Future research on anxiety requires new and better

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approaches to measuring interpretation biases, especially concerning implicit and automatic cognitive processes.

Validation of the Momentary Interpretation Bias Instrument for Fear of Public Speaking in Daily Life

Presenter: **Vera Bouwman**, Utrecht University

Objective: Interpretation bias (IB) is the tendency to interpret ambiguous information in a negative manner and is thought to maintain anxiety, like fear of public speaking. Recent research emphasizes the dynamic nature of psychopathology in which symptoms can fluctuate across time. However, we know of no measures of IB that assess state IB to capture these fluctuations across time. This study validates a newly developed momentary interpretation bias instrument (MIBI) that measures state IB for fear of public speaking.

Method: In this Stage 1 accepted Registered Report, the MIBI is measured ten times a day for four days using Experience Sampling Method within a sample with high fear of public speaking to examine variability, reliability, and convergent, predictive, and discriminant validity. To test sensitivity of the instrument to capture changes in IB, halfway through the measurement period, participants are randomly assigned to complete a positive IB training (n = 50), expected to reduce negative IB, or a neutral IB training (n = 50).

Results: Preliminary findings will be presented. Promisingly, the MIBI was used in a previous study where it showed good multilevel reliability and intraclass correlations, and was able to capture differential responses to the IB training conditions.

Conclusion: Once validated, this measure could add to existing measures of IB as it, contrary to existing trait IB measures, allows for capturing intra-individual fluctuations of state IB within a day which is in line with recent advances in which psychopathology is conceptualized as inherently dynamic.

Interpretation Bias Inflexibility, Insight, and Social Cognition in Body Dysmorphic Symptomatology: A Network Analysis

Presenter: **Fanny Dietel**, University of Osnabrueck

Objective: Prior research indicates that body dysmorphic disorder (BDD) is characterized by rigid, negative interpretation patterns, low insight, and deficits in social cognition. Despite the postulated etiological role of these factors, it remains unclear to what extent they interact and synergetically contribute to phenomena associated with higher symptom severity and reduced effectiveness of therapeutic interventions, such as maladaptive core beliefs and difficulties in social interactions. Thus, a deeper understanding of these interactions may help to inform both extant etiological frameworks and the interventional spectrum of BDD.

Method: Addressing these gaps, the present study will explore multimodal associations between interpretational inflexibility, insight, and social cognition in a large sample exhibiting varying levels of BDD symptoms (n-target = 300) using cross-sectional network analyses.

Relevant constructs will be assessed via an adapted version of the Bias Against Disconfirmatory Evidence (BADE) Task, the EmpaToM task, and appearance-related insight measures.

Results: Data collection is to be concluded by April 2024. Within network analyses, all relevant indices (i.e., association and centrality) will be reported.

Conclusion: The results of this study have important implications for expanding etiological models of BDD, particularly regarding their explanatory power for functional impairment within social interactions. Further, multimodal association analyses may provide insights into potential avenues for new interventions, such as innovative cognitive retraining to enhance interpretational flexibility.

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Indirectly assessed dysfunctional appraisals in Posttraumatic Stress Disorder over the course of trauma-focused treatment

Presenter: **Charlotte Wittekind**, LMU Munich

Objective: Dysfunctional appraisals represent a core symptom of Posttraumatic Stress Disorder (PTSD). It has been shown that a reduction of negative cognition predicted a reduction of PTS symptoms (e.g., Kleim et al., 2013). However, dysfunctional appraisals have mainly been assessed by means of interviews and questionnaires although automatically activated cognition has also been ascribed an important role. One study (Blackwell et al., 2021) provided first evidence that higher levels of PTS symptoms were associated with higher levels of implicitly assessed dysfunctional appraisals; however, the study was conducted in a non-clinical sample. If automatically activated negative cognition is associated with PTSD, an important question is whether it can be reduced by means of trauma-focused therapy (TFT). The aim of the present study was to address these open questions.

Method: Patients with PTSD, traumatized individuals without PTSD and a non-traumatized group were recruited. Participants completed two different Implicit Association Tests (IATs). In one IAT, the associative strength between the concepts self versus others and vulnerability was assessed, in the other IAT the association between the concepts self versus others and traumatized (vs. healthy). A subsample of the PTSD group was re-assessed upon completion of TFT.

Results: Results of the final sample will be presented.

Conclusion: The study provides important theoretical and clinical implications. If PTSD is associated with automatically activated negative cognition, then reducing these cognitions might be crucial for clinical outcome. The study provides preliminary data whether current treatments meet this aim or whether targeted trainings are needed.

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ASSESSING COGNITIVE BIASES IN LESS COMMONLY RESEARCHED CONDITIONS
Session type: Individual Oral Presentations
Time: Monday, July 22 nd ; 15.45-16.45
Location: Arts Two: Lecture Theatre
Chair: Janna N. Vrijesen , Radboud University Medical Center & Pro Persona Mental Healthcare
The role of biased selection of information in the formation of expectancies about parenthood during pregnancy - Developing the selective interrogation of information task for pregnancy
Presenter: Mahdi Mazidi , The University of Western Australia
<p>Objective:</p> <p>Recent studies have shown the critical role of expectancies about parenthood as one of the factors associated with and predicting elevated prenatal worry, a key vulnerability factor during pregnancy. However, research is lacking on the cognitive mechanisms underlying these expectancies. We tested a hypothesis regarding the cognitive mechanisms that may underpin the formation of such negative expectancies. Specifically, a novel cognitive paradigm was developed and employed that provides a reliable assessment of selective interrogation of information (i.e., Selective Interrogation of Information Task).</p> <p>Method:</p> <p>The study recruited 92 first-time pregnant women and evaluated their prenatal worry, parenthood expectancies, and tendency to volitionally choose negative rather than positive information about parenthood (i.e., demonstrate a negative interrogation bias). Moreover, the assessment of expectancies about parenthood was repeated after the selective interrogation task to examine if the pattern of interrogation bias would predict changes in expectancies from pre to post the selective interrogation task.</p> <p>Results:</p> <p>Our findings revealed a significant association between negative expectancies about parenthood and elevated prenatal worry. More importantly, pregnant women with a negative interrogation bias were more likely to hold negative expectancies concerning parenthood. The relationship between this bias and prenatal worry was mediated by negative expectancies. Finally, it was found that the interrogation bias predicted a change in parenthood expectancies even when the initial expectancy levels were controlled for.</p> <p>Conclusion:</p> <p>Findings are discussed with regards to potential implications for expectancy-focused cognitive bias modification interventions for prenatal worry.</p>
Contamination fear and attention bias variability early in the COVID-19 pandemic
Presenter: Patrick Clarke , Curtin University
<p>The onset of the COVID-19 pandemic resulted in a dramatic increase in the salience and importance of information relating to both the risk of infection, and factors that could mitigate against such risk. This contributed to elevated contamination fear concerns in the general population. Biased attention for contamination-related information has been proposed as a potential mechanism underlying contamination fear, though evidence regarding the presence of such biased attention has been inconsistent. A possible reason for this is that contamination fear may be characterised by variability in attention bias that has not yet been examined. The current study examined the potential association between attention bias variability for both contamination-related and mitigation-related stimuli, and contamination fear during the early stages of the COVID-19 pandemic. A final sample of 315 participants completed measures of attention bias and contamination fear. The measure of average attention bias for contamination-related stimuli</p>

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and mitigation-related stimuli was not associated with contamination fear ($r = 0.055$ and $r = 0.051$, $p > 0.10$), though both attention bias variability measures did show a small but statistically significant relationship with contamination fear ($r = 0.133$, $p < 0.05$; $r = 0.147$, $p < 0.01$). These attention bias variability measures also accounted for significant additional variance in contamination fear above the average attention bias measure (and controlling for response time variability). These findings provide initial evidence for the association between attention bias variability and contamination fear, underscoring a potential target for cognitive bias interventions for clinical contamination fear.

Social motivation tendencies in schizophrenia: group comparisons on the approach-avoidance task

Presenter: **Suzanne Ho-wai So**, The Chinese University of Hong Kong

We examined social motivation tendencies (approach, avoidance) in schizophrenia. We hypothesized that, compared to healthy individuals, patients with schizophrenia would show a stronger tendency to avoid aversive social stimuli (angry faces) and a milder tendency to approach pleasant social stimuli (happy faces).

Social motivation was measured implicitly with the Approach-Avoidance Task (AAT; Heuer et al, 2007), consisting of 192 face stimuli of 3 affect conditions (angry, happy, neutral) and 2 gaze directions (direct, averted). From the observed reaction times, we computed difference scores (push minus pull) and double-difference D-scores (Kahveci et al, 2023).

The validated sample consisted of 93 patients with schizophrenia (mean age 34.16, SD 12.93) and 92 age- and gender-matched healthy controls (mean age 34.41, SD 13.01). Analyses using difference scores revealed no significant group differences on social motivation tendencies across all affect or gaze directions ($p > .050$). Analyses using double-difference D-scores revealed no group difference when faces were presented in straight gaze, where both groups tended to approach valenced faces as opposed to neutral faces. When faces were presented in averted gaze, both groups tended to approach angry faces and avoid happy faces, with the latter being marginally stronger among healthy individuals than patients ($U = 3586$, $p = .058$, $ES = 0.16$).

Using an enhanced AAT, consisting of various affect conditions and gaze directions, we found more similarities than differences in social motivation tendencies between patients with schizophrenia and healthy individuals. Rather than avoiding angry faces, patients and healthy individuals tended to approach angry faces.

Tackling social media's black box problem: A new approach to studying associations between cognitive biases and content recommendation systems

Presenter: **Amelia Reynolds**, The University of Western Australia

Objective: Content recommendation systems on social media platforms raise the concern that vulnerable individuals will be disproportionately shown content they are biased towards. Though, unfortunately for researchers examining associations between cognitive biases and content recommended to individuals exhibiting these biases, the exact ways in which these systems recommend content are often unknowable, i.e., the black box problem. To overcome this, we took a black box testing approach, and developed a novel protocol for collecting samples of participants' recommended content for use as experimental stimuli.

Method: Undergraduate students ($N = 120$) completed the study, in which 10 recommended TikTok videos were collected from each participants' mobile device. Participants' symptoms of anxiety, depression, and disordered eating were also assessed. Subsequently, to assess associations between symptoms and recommended content, collected TikTok videos will be rated by an independent sample ($N \approx 150$).

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Results: In addition to cultivating a stimulus set of recommended TikTok videos paired with participants' symptom measures, this study will provide valuable insight into potential systematic differences in the content recommended to vulnerable individuals.

Conclusion: Findings will be discussed with regards to limitations and potential implications for researchers seeking to circumvent social media's black box problem, for whom the developed protocol will enable the use of ecologically valid stimuli in future studies examining associations between cognitive biases and content recommendation systems.

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COGNITIVE BIAS MODIFICATION IN DIFFERENT PSYCHOPATHOLOGIES
Session type: Individual Oral Presentations
Time: Monday, July 22 nd ; 15.45-16.45
Location: Bancroft: 1.13 classroom
Chair: Charlotte Wittekind , LMU Munich
Decreasing attentional bias for food cues in satiated women with obesity: a pilot study examining feasibility and acceptability
Presenter: Nienke C. Jonker , University of Groningen
<p>Although many of us tend to have an attentional bias for food cues when we are hungry, women with obesity seem to still have this bias when they have just eaten. This constant temptation even when food is not needed may help explain why it is so difficult to restrict food intake, let alone lose weight. In this pilot study, we examined the feasibility and acceptability of an attentional bias modification training during satiation for women with obesity. Participants were 25 women with obesity and a dieting intention. During a pre-test attentional bias was assessed while participants were satiated. Following this, they performed an attentional bias modification training (ABMt) for 10 minutes every day for three weeks. Lastly, during a post-test, participants completed a questionnaire and interview about the feasibility and acceptability of the training. Furthermore, again while satiated, attentional bias was re-assessed. Findings indicated that for the targeted group of women with obesity it was acceptable and feasible to self-apply the training-sessions within the required satiated state: 92% of the sessions were completed, 97% of those being completed on the intended day, and 94% being completed in a satiated state. Adding further to the feasibility/acceptability of the current approach, the intervention received a rating between neutral and positive, and there was no evidence for an adverse effect on craving. The findings support the feasibility of setting the critical next step of testing the ABMt's efficacy to facilitate a decrease in food intake in women with obesity.</p>
An updated individual participant data meta-analysis on cognitive bias modification for changing alcohol and tobacco use
Presenter: Ting Pan , University of Amsterdam
<p>In recent years, more studies have been published on effects of Cognitive Bias Modification (CBM), as (add-on) therapy for substance use. Building on Boffo et al (2019; Neuropsychology Review), this updated individual participant data meta-analysis (IPDM), examines the effects of Cognitive Bias Modification (CBM) on changing alcohol and tobacco use. We use data from 33 studies including over 8000 participants (2435 included in the first IPDM, and 5713 new inclusions). Main outcomes were reductions in the targeted biases, substance use, or relapse rate in abstinence-oriented treatment at the short-to-long term follow-ups. Study-level moderators include control condition types (e.g., sham control, passive control) and cognitive bias training variants (e.g., approach bias modification, attentional bias modification), participant-level moderators are addiction severity and training dosage. We will present the frequency meta-analysis results, alongside with preliminary findings from the Bayesian IPDM, offering an updated perspective on CBM's effectiveness in changing alcohol and tobacco use.</p>
The effectiveness of app-based cognitive control training and self-paced CBT in a sample 'at risk' of mood disorders
Presenter: Alexander MacLellan , University of Bath
<p>Introduction: App based interventions for mental health and wellbeing are widely available to the general public, and proposed as a low cost, convenient option for managing mental health. Additionally, given the links between impaired cognitive control and mood disorders, cognitive control interventions are increasingly researched, though findings are mixed. This</p>

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study investigates the effectiveness of a self-paced CBT app, and a cognitive control training, and whether symptom improvement may be explained by improvements in cognitive control. Methods: An estimated 180 participants with mild to moderate symptoms will be randomly assigned to either a self-paced CBT app, a cognitive control training app or a waitlist control condition, which they are instructed to complete daily over a four-week period. Participants complete measures of anxiety, depression, wellbeing and cognitive control at baseline, post-intervention and at 12 weeks.

Results: Data collection is ongoing at the point of submission but expected to be completed by the time of the conference in July. Mixed linear models will be conducted to assess the effectiveness of interventions over time. Causal steps mediation analysis will be conducted to determine whether intervention-related changes in symptoms are mediated by changes in cognitive control.

Discussion: The results of this study will have implications for the effectiveness of app-based interventions and for cognitive control trainings more generally. Additionally, should change in working memory capacity be found to mediate intervention related changes in symptoms, this will be interpreted as support for improving cognitive control as a common mechanism of action for mood disorder treatment.

Content-specificity of a single-session cognitive bias modification of interpretations for social anxiety

Presenter: **Gemma Sicouri**, University of New South Wales

Objective: Social anxiety disorder (SAD) is a common and debilitating condition, yet many individuals have difficulty accessing care or do not improve following treatment. Cognitive bias modification of interpretations (CBM-I) is an easily accessible treatment which could improve outcomes for individuals with SAD, however effects sizes for symptomatic improvement has been small. CBM-I's efficacy could be improved by tailoring content of the intervention to the disorder, known as content-specificity. The current study examined whether CBM-I was associated with better outcomes when the content was relevant to SAD (content-specific CBM-I) compared to when it was irrelevant (non-content-specific CBM-I).

Method: Participants (18-35 years old) with elevated social anxiety were randomised to either a single session of content-specific CBM-I (n = 55) or non-content-specific CBM-I (n = 55).

Outcomes were negative interpretation bias, social anxiety symptoms and state anxiety.

Results: The content-specific group had significantly greater reductions in negative interpretation bias and social interaction anxiety symptoms than the non-content-specific group. Contrary to hypotheses, the non-content specific group had significantly larger reduction in state anxiety than the content-specific group. There were no group differences for social observation anxiety.

Conclusion: The results indicated that CBM-I for SAD could be improved by matching the content of the intervention to the disorder. Future research should seek to replicate the results using multiple sessions and to consider the importance of tailoring CBM-I to individuals' specific anxiety disorder subtypes and biases.

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ENHANCING THE IMPACT OF CBM: FROM AUGMENTATION TO IMPLEMENTATION

Session type: **Early Career Keynote**

Time: Tuesday, July 23rd; 09.15-10.15

Location: Arts Two: Lecture Theatre

Speaker: **Janna N. Vrijzen**, Radboud University Medical Center & Pro Persona Mental Healthcare

Bias is important for our mental health and CBM is a high-potential but currently rather low-impact tool to improve mental health. Working in the mental healthcare and psychiatry setting, I am motivated to find ways to increase the impact of CBM on clinical care and hence the patient. I will present several routes I am exploring to achieve this: (i) by augmenting the effect of CBM and yielding positive memory bias enhancement through physical exercise. Another route is (ii) providing memory bias assessment and bias modification via a smartphone to increase transfer to daily life processing. In this light, (iii) bringing CBM to mentally vulnerable somatic and developmental populations has potential for secondary prevention of anxiety and depression. These population are currently often underserved in mental healthcare. Finally, (iv) deliberately and strategically preparing for implementation of CBM in mental healthcare can enhance its impact and ensure more patients are ultimately being helped. I will present ACBM's collective work on evaluating the readiness for implementation for different types of CBM and different target populations, while also informing about further implementation steps we can take. With this keynote I hope to provide some examples of how to enhance CBMs impact on clinical care, while inspiring to think about potential usage early on in our CBM-development journey.

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BIASED BELIEF UPDATING IN DEPRESSION – WHY IT IS SO PERSISTENT AND HOW IT CAN BE MODIFIED

Session type: **Early Career Keynote**

Time: Tuesday, July 23rd; 09.15-10.15

Location: Arts Two: Lecture Theatre

Speaker: **Tobias Kube**, University of Göttingen

While negative beliefs have been recognised as a core feature of depression for decades, it is only recently that research has focused on systematically investigating the changeability of beliefs. As such, research has shown that negative beliefs, once established in depression, often persist and are unlikely to be revised in response to positive, disconfirming experiences. In this talk, I will present recent evidence for this so-called biased belief updating in depression and discuss both the cognitive and affective mechanisms underlying it. Specifically, in a series of experimental studies, we have found that a cognitive devaluation of positive information (e.g., by questioning its validity or by assuming that it is an exception) as well as the presence of negative affect contribute to lower updating of negative beliefs. Furthermore, our results suggest that, contrary to the predictions of traditional learning models, the degree of belief updating is not the greater, the more discrepant new information is. Instead, there is a threshold above which the discrepancy between belief and outcome is so large that doubts about the validity of the information arise and the degree of belief updating decreases. In the last part of this talk, I will discuss evidence for potential intervention strategies thought to modify biased belief updating and improve the integration of novel positive experiences.

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THE TRANSDIAGNOSTIC VALUE OF COGNITIVE BIASES AND THEIR PSYCHOPHYSIOLOGICAL CORRELATES

Session type: **Symposium**

Time: Tuesday, July 23rd; 10.30-11.50

Location: Arts Two: Lecture Theatre

Chair: **Elinor Abado**, University of Göttingen

This symposium integrates research on cognitive biases and their psychophysiological correlates, from a transdiagnostic perspective. While studies differ in their methods and populations, they all point to a robust link between biased cognition and emotional responses.

The first talk explores the relationship between math-failure associations and attentional biases, and math anxiety in adolescents. Results indicate that math-failure associations may play a key role in maintaining math anxiety, suggesting implications for intervention strategies.

The second talk focuses on the link between depressive symptoms, interpretation inflexibility, and belief updating. Preliminary findings suggest that depression may be characterized by biased behavioral and psychophysiological responses to positive information, highlighting the need for further research in this area.

The third talk examines the Combined Cognitive Biases Hypothesis in the context of contamination-related obsessive-compulsive disorder (C-OCD). By investigating the relationships between different cognitive biases and disgust sensitivity, the study provides insights into the underlying mechanisms maintaining C-OCD and informs future treatment approaches.

The fourth talk presents a registered report on the temporal dynamics and causal interaction between expectancy and attention biases toward threat. The study uses event-related potentials to explore how expectancies are linked to attention bias toward threat, aiming to better understand the complex interactions between both biases and threat detection.

Together, these talks contribute to our understanding of cognitive biases in psychological processes, highlighting their relevance for clinical practice and the development of targeted interventions. Importantly, these talks also emphasize the transdiagnostic value of cognitive biases, as they play a role in various disorders.

Math-Failure Associations, Attentional Biases, and Avoidance Bias: The Relationship with Math Anxiety and Behaviour in Adolescents

Presenter: **Elske Salemink**, Utrecht University

Objective: Math anxiety in adolescence negatively affects learning math and careers. The current study investigated whether three cognitive biases, that is math-failure associations, attentional biases (engagement and disengagement), and avoidance bias for math, were related to math anxiety and math behaviour (math grade and math avoidance behaviour).

Method: In total, 500 secondary school students completed three cognitive bias tasks, questionnaires and a math performance task, and reported their grades.

Results: Math-failure associations showed the most consistent associations with the outcome measures. They were associated with higher math anxiety above and beyond sex and education level. Those math-failure associations were also associated with lower grades and more avoidance behaviour, however, not above and beyond math anxiety. Engagement bias and avoidance tendency bias were associated with math avoidance behaviour, though the avoidance bias finding should be interpreted with care given the low reliability of the measure. Disengagement biases were not associated with any math anxiety nor behaviour outcome measure.

Conclusion: Whereas a more reliable instrument for avoidance bias is necessary for conclusions on the relations with math performance and behaviour, the current results do

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suggest that math-failure associations, and not attentional bias, may play a role in the maintenance of math anxiety.

Interpretation inflexibility in depression - Results from two eye tracking studies

Presenter: **Tobias Kube**, Georg-August-University of Goettingen

Objective: Depressive symptoms have been linked to difficulties in revising established negative interpretations in response to novel positive information, referred to as interpretation inflexibility. Recent predictive processing accounts have suggested that this bias may be related to a blunted processing of positive prediction errors at the neural level. To test hypothesis, we performed two experimental studies, in which the pupil dilation in response to unexpected positive emotional information was examined.

Method: In both studies, participants completed a modified version of the emotional Bias Against Disconfirmatory Evidence (BADE) task. In Study 1, a non-clinical sample (N=34) was provided with written interpersonal scenarios that initially suggested negative interpretations which were later either confirmed or disconfirmed by additional information. In Study 2, a sample of patients with major depression (N=46) and an age-matched healthy control sample (N=44) underwent an extended BADE task comprising four scenario types: confirming-the-negative, confirming-the-positive, disconfirming-the-negative, disconfirming-the-positive. **Results:** In Study 1, behavioural results showed that depressive symptoms were related to difficulties in revising negative interpretations despite disconfirmatory positive information. The eye tracking results pointed to a reduced pupil response to unexpected positive information among people with elevated depressive symptoms. The data from Study 2 have not yet been fully analysed, but will be analysed and presented at the conference.

Conclusion: The preliminary results suggest that depression may be characterised by deviations in both behavioral (i.e., reduced updating of negative interpretations) and psychophysiological (i.e., decreased pupil dilation) responses to unexpected positive information.

Is there preliminary evidence for the Combined Cognitive Biases Hypothesis in the context of contamination-related obsessive-compulsive symptoms? An exploration of the associations between different cognitive biases and disgust sensitivity

Presenter: **Hanna Bethcke**, University of Potsdam

Objective: 30% of patients with contamination-related obsessive-compulsive disorder (C-OCD) do not benefit from exposure with response prevention, highlighting the need for additional strategies to enhance C-OCD treatment. One reason for the non-response may be the existence and persistence of contamination-specific cognitions. Hence, understanding the underlying mechanisms of contamination-related cognitions, in the specific context of disgust is crucial for developing effective treatment approaches for C-OCD. This study aims to preliminary test whether the CCBH might serve as a suitable explanatory framework for aspects of the maintenance of C-OCD symptoms. The CCBH states that cognitive biases influence each other and/or that their interaction influences, for example, C-OCD symptoms. **Method:** Healthy individuals (planned N=104, present N= 15) will watch a validated, disgust-inducing film and complete a disgust-related Scrambled Sentence Task (interpretation bias) while their eye movements are recorded (attention bias). Subsequently, the number of recalled disgusting and neutral sentences used in the SST is measured (memory bias), along with disgust sensitivity and C-OCD symptoms.

Results: Correlation and path analyses will be conducted to explore the relationships between the different cognitive biases, disgust sensitivity, and C-OCD symptoms. We anticipate that statistical models considering relations between cognitive biases will better explain the data than models associating cognitive biases independently with disgust sensitivity.

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Conclusion: The findings aim to provide preliminary insights into whether the CCBH serves as a helpful explanatory framework for aspects of the maintenance of C-OCD. Furthermore, we will discuss avenues for further investigating the CCBH in C-OCD in future studies.

Expectancy and attention bias to spiders: dissecting anticipation and allocation processes using ERPs

Presenter: **Elinor Abado**, University of Haifa

Objective: The presented registered report focuses on the temporal dynamics of the relationship between expectancy and attention toward threat, to better understand the mechanisms underlying the prioritization of threat detection over expectancy. In the presented event-related potentials (ERP) experiment, a-priori expectancy was manipulated, and attention bias was measured, using a well-validated paradigm.

Method: A visual search array was presented, with one of two targets: spiders (threatening) or birds (neutral). A verbal cue stating the likelihood of encountering a target preceded the array, creating congruent and incongruent trials. Following cue presentation, preparatory processes were examined using the contingent negative variation (CNV) component. Following target presentation, two components were measured: early posterior negativity (EPN) and late positive potential (LPP), reflecting early and late stages of natural selective attention toward emotional stimuli, respectively.

Results: Behaviorally, spiders were found faster than birds, and congruency effects emerged for both targets. For the CNV, a non-significant trend of more negative amplitudes following spider cues emerged. As expected, EPN and LPP amplitudes were larger for spider targets compared to bird targets. Data-driven, exploratory, topographical analyses revealed different patterns of activation for bird cues compared to spider cues. Furthermore, 400-500 ms post-target, a congruency effect was revealed only for bird targets.

Conclusion: Together, these results demonstrate that while expectancy for spider appearance is evident in differential neural preparation, the actual appearance of spider target overrides this expectancy effect and only in later stages of processing does the cueing effect come again into play.

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NEW DEVELOPMENTS IN ASSESSING APPROACH-AVOIDANCE TENDENCIES
Session type: Symposium
Time: Tuesday, July 23 rd ; 10.30-11.50
Location: Bancroft: 1.13 classroom
Chair: Julia Michalek , Queen Mary University of London
<p>Human tendencies to approach rewarding situations and to avoid potential threat are one of the key drivers of our behaviours, and disruptions in these patterns have been previously linked to various psychopathologies. One of the most popular methods of measuring approach-avoidance biases are behavioural reaction time-based tasks (AATs) which have been used with a wide range of stimuli and populations. Recent adaptations of the AAT suggest promising developments in approach-avoidance assessment and modification. Understanding the methodological intricacies and reliability of these measures is vital for developing effective interventions and modification treatments.</p> <p>In this interdisciplinary symposium, we include one review with data re-analysis and two empirical studies. In Presentation 1, Dr Julia Michalek will discuss a study investigating the reliability and validity of a novel, touch-screen version of the approach-avoidance task in primary school children in East London, and explore potential links with their anxiety and depression symptoms. In Presentation 2, Mr Sercan Kahveci will discuss the important differences of approach-avoidance bias measured by initiation time compared with movement duration. Finally, Prof Mike Rinck, will present results from a novel version of a task-irrelevant AAT and discuss its performance. Together, these talks will shed light on the mechanisms of measure of approach-avoidance behaviours across a range of populations, exploring new developments, and building knowledge of reliable methodologies.</p>
Approach-avoidance tendencies to emotional expressions in childhood: a touch-screen measure of bias
Presenter: Julia Michalek , Queen Mary University of London
<p>Atypical approach-avoidance behaviours to threatening social situations are present in adults with depression and anxiety; however, these patterns are not yet fully understood in children. In this pre-registered study, we used a novel touch-screen version of the approach-avoidance task (AAT) to investigate approach and avoidance behaviours of 7–11-year-old children in school settings in East London. All data were collected as part of the Development of Emotional Resilience (DEER) observational cohort study between November 2022 and November 2023. 549 children completed 64 trials of a feature-relevant, touch-screen tablet AAT with emotional facial expressions (angry and happy) and reported on their levels of anxiety and depression. In the main analysis, our aim is to measure the task internal reliability and to use validated mental health scales (Revised Child Anxiety and Depression Scale; RCADS) to assess the task validity. Our findings will shed light on potential links between approach-avoidance tendencies and symptoms of anxiety (especially social anxiety) and depression in young children, which may help inform attention bias modification interventions for those at higher risk for psychopathology. Results and their implications will be discussed.</p>
What determines whether approach bias effects will occur in movement speed versus in movement initiation time?
Presenter: Sercan Kahveci , Paris-Lodron-University of Salzburg
<p>The approach-avoidance is commonly used to measure implicit approach-avoidance tendencies towards a wide range of clinically relevant stimuli; the stimuli often differ in how quickly participants initiate movements towards versus away from them. However, in other cases, it is not (only) in the initiation of movement where such an approach-avoidance bias is present, but (also) in the speed of the movement itself. I review a number of studies that</p>

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separately measured biases in movement initiation and duration, showing that bias effects are ubiquitous in movement initiation time, but occur only half of the time in movement duration. I present a re-analysis of my touchscreen-based AAT studies to explain why bias effects occur in one time domain or the other, and extend the resulting hypothesis back to the literature to explain previous findings. Furthermore, I discuss the relative merits of defining approach-avoidance bias as movement initiation time, movement duration, or their sum.

Can the task-irrelevant version of the Approach-Avoidance task be saved?

Presenter: **Mike Rinck**, Radboud University

Reaction time tasks like the Approach-Avoidance Task often employ instructions which make the stimulus feature of interest, e.g. emotional valence, task-irrelevant. For instance, participants are instructed to approach or avoid images depending on their tilt, not their valence. Although this procedure is elegant and promises to assess automatic approach-avoidance tendencies, it has been criticized for having very low reliability and validity, and it often fails to show the expected compatibility effect: Faster approach of positive stimuli and faster avoidance of negative ones. In this study, we aimed to test whether a new version of the task would solve these problems. In this new two-step Categorization task version, participants cannot ignore stimulus valence because they first have to categorize each image into positive/negative, then the image tilts, and then they have to pull it closer (approach) or push it away (avoidance) with a joystick. Student participants were randomly assigned to this new Categorization AAT, an Indirect AAT (responding to tilt), or a Direct AAT (responding to valence). Contrary to our expectations, but consistent with earlier results, only the Direct version yielded a strong and significant compatibility effect. The implications of this finding will be discussed.

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ASSESSMENT AND MODIFICATION OF DIFFERENT DEPRESSION-RELATED CONSTRUCTS
Session type: Individual Oral Presentations
Time: Tuesday, July 23 rd ; 12.00-13.00
Location: Arts Two: Lecture Theatre
Chair: Jeremy W. Pettit , Florida International University
Burden-related interpretation bias: A novel predictor of perceived burdensomeness and suicidal thoughts and behaviors
Presenter: Jeremy W. Pettit , Florida International University
<p>Background: The interpersonal theory of suicide proposes that perceived burdensomeness (PB), meaning the belief that one's death is worth more than one's life to others, is a proximal cause of suicide ideation. We examined whether the tendency to interpret situation-specific information as indicating one is a liability on others (i.e., burden-related interpretation bias) is associated with PB and suicide thoughts and behaviors.</p> <p>Methods: We first created two tasks to measure burden-related interpretation bias, leveraging a sentence completion paradigm and a word-sentence association paradigm. N=888 participants (Mean age = 19.4 years, SD = 2.2; 78.1% cisgender women; 67.1% White) completed the tasks and measures of PB, suicide ideation and suicide attempt, and depressive symptoms at baseline again one week later.</p> <p>Results: Burden-related interpretation bias was significantly associated with PB, suicide ideation, and a lifetime suicide attempt. PB mediated the associations between burden-related interpretation bias and suicide thoughts and behaviors. These associations largely remained significant after controlling for depressive symptoms.</p> <p>Conclusions: These results identify burden-related interpretations as an information processing bias related to the belief that one is a burden on others and suicide thoughts and behaviors. As such, they set the stage for the development and evaluation of approaches to intervene on burden-related interpretation bias to prevent and/or reduce suicide thoughts and behaviors.</p>
Exploring how threatening interpretations of social situations contribute to daily fluctuations in loneliness in young adults
Presenter: Laura Riddleston , Queen Mary University of London
<p>Objective: Loneliness has become a major concern globally. It is particularly common in adolescence and young adulthood, and is linked with poor psychosocial and health outcomes. Psychological models suggest that individuals with 'threat interpretation biases' during social information processing may be more likely to experience long-term loneliness. Therefore, these threat interpretations could reflect targets for change in interventions. However, it remains unclear the degree to which these threat biases associate with loneliness, particularly in daily life. The aim of this research was to conduct an Ecological Momentary Assessment (EMA) study to test the hypotheses that associations between threat interpretations and loneliness emerge in daily life. We address these questions in young adults who are university students, a group who report particularly high levels of loneliness.</p> <p>Method: Participants completed a set of baseline questionnaires prior to beginning the EMA assessments, including demographic and mental health data, and measures of loneliness, preference for solitude, social interpretation biases, anxiety, depression, and social anxiety. The EMA assessments were conducted via a smartphone app, 6 times per day for 7 days. These collected data on current loneliness, mood, recent and future social interactions and appraisals of these interactions. Results: Appraisal ratings of social interactions were used as an index of interpretations. We will present results from multilevel regression analyses assessing within-person concurrent and temporal associations between real-life threat interpretations, social interactions, and loneliness. Conclusion: These data will provide</p>

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valuable initial insights into cognitive mechanisms of loneliness, and informing the feasibility of larger future studies.

Insights on hopelessness and suicide ideation: A longitudinal study on the role of cognitive biases and emotion regulation

Presenter: **Ivan Blanco**, Complutense University of Madrid

Background: Suicide is increasing worldwide. One of the main factors that contribute to the appearance of suicide ideation is hopelessness. Cognitive-emotional theories propose negative cognitive biases and emotion regulation (ER) may contribute to their development. However, empirical evidence on these relationships is limited. The current study aims to investigate the longitudinal predictive role of negative cognitive biases and ER in the development of hopelessness and suicide ideation.

Methods: A total of 185 participants (83.2% female, mean age: 20.55 years) completed three assessments approximately 1.5 months apart. They completed an objective measure of cognitive biases (modified SST) and a set of questionnaires on their use of emotion regulation strategies (rumination, emotional suppression, and reappraisal) and their levels of hopelessness and suicide ideation.

Results: Structural equation modeling analyses revealed that rumination, emotional suppression, reappraisal, and hopelessness mediated the relationship between negative cognitive biases and the appearance of suicide ideation. The final model showed an excellent fit [$\chi^2=7.63$ (9); $p = .572$; $\chi^2/df = .85$; CFI = 1; TLI = 1.02; RMSEA (90%) = .000].

Conclusions: This study sheds new light on the role of cognitive biases and ER in explaining the development of hopelessness and suicide ideation and highlights potential new mechanisms for understanding and preventing these conditions.

Motivation-enhanced cognitive bias modification for inferential flexibility

Presenter: **Nilly Mor**, Hebrew University of Jerusalem

A negative inferential style, whereby one makes internal, global, and stable causal inferences for negative events, increases the negative impact of such events and is highly associated with psychopathology. Cognitive Bias Modification (CBM) for inferential flexibility trains people to shift from negative to positive causal inferences and reduces negative mood and ruminative thinking. However, shifting requires cognitive control and effort. Motivation is a force that drives effort, and so can overcome the resistance to engaging in demanding tasks. Therefore, motivation becomes an important variable to consider. In the current online study, 160 participants were randomly assigned to one of three groups: inferential flexibility CBM training with an added motivation component, CBM training alone, and a control group receiving sham training. Each participant underwent a session of their assigned training, followed by assessments of their inferences, mood, and rumination levels, both immediately post-training and the next day. Manipulation checks confirmed successful motivation induction. In line with our hypotheses, both training conditions exhibited near transfer effects on inferences for a personal event, manifesting as a decrease in inferential negativity compared to the control condition. This effect was larger for the enhanced motivation condition, particularly on the next day. Moreover, participants in the training conditions experienced mood improvements, with those in the enhanced motivation condition also showing decreased rumination. This randomized trial illustrates the feasibility of incorporating motivation in CBM interventions and suggests that adding a motivation induction component can enhance the efficacy of CBM.

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COGNITIVE BIAS MODIFICATION FOR INTERPRETATION – RECENT DEVELOPMENTS, NOVEL PROTOCOLS, AND CLINICAL CONSIDERATIONS

Session type: **Individual Oral Presentations**

Time: Tuesday, July 23rd; 12.00-13.00

Location: Bancroft: 1.13 classroom

Chair: **Elske Salemink**, Utrecht University

“COBITH“ – Improved Cognitive Biases Modification Training targeting interpretation bias in OCD – evaluation of the training materials and the planned trial

Presenter: **Daniel Tönsing**, University of Basel

Cognitive-Behavioral-Therapy (CBT) is the state-of-the-art treatment of Obsessive-Compulsive-Disorder (OCD). However, symptoms persist in 40-50% of treated OCD. Cognitive-Bias-Modification for Interpretations (CBM-I) that focus on the misinterpretation of intrusive thoughts may complement CBT. Initial CBM-I studies indicated a robust bias reduction but no downstream effect on emotional and behavioral outcomes. We here investigate whether a methodically improved multisession CBM-I overcomes these limitation. First, we evaluated training material in three consecutive studies. Second, we plan to evaluate the training in a randomized controlled trial.

Training scenarios were generated and adapted to consider typical ICT situations and ensuring relevance for OCD. In study 1 (N = 259) and study 2 (N = 110) participants rated scenario sets. The responses were subsequently assessed for ICT consistency by two independent raters. In study 3 (N = 180), we investigated whether a recognition task was sensitive to an ICT relevant unwanted intrusive thoughts (UIT) induction (vs. ICT-irrelevant UIT, no induction).

In Study 1, 18 (30%) of the scenarios resulted in balanced ICT resolutions. In Study 2, 41 (66 %) of the revised and new scenarios resulted in balanced ICT resolutions. Additionally, the number of ICT-consistent ratings was positively correlated with OC symptoms. Eight (80%) scenarios were suitable for the recognition task. The UIT activation showed no higher ICT-consistent ratings.

Developing suitable training scenarios for an CBM-I training targeting ICT is challenging, but feasible. Possible reasons for the lack of an effect of the UIT activation in study 3 are discussed. Additionally, the planned CBM-I trial is presented.

A randomized controlled trial to assess the efficacy of a mobile app-based Cognitive Bias Modification (CBM) therapy for Paranoia called STOP (Successful Treatment for Paranoia)

Presenter: **Pamela Jacobsen**, University of Bath

Objective: Paranoia, or worries about harm from others, is a concern many people may experience and can cause distress and impairment in everyday life. Digital interventions are an important part of increasing access to help and support, including to those who may not be accessing mental health services. STOP (Successful Treatment of Paranoia) is a smartphone app which is designed to target a common cognitive bias towards threatening interpretations of ambiguous or neutral scenarios (cognitive bias modification).

Methods: The STOP study is a three-arm, double-blind, multi-site randomised controlled trial. 273 participants experiencing paranoia will be recruited from both clinical and non-clinical populations. All participants will be randomly allocated to receive one of two versions of STOP (6 or 12 weeks) or a text-reading control. To assess the efficacy of the app, assessments will be completed pre, post and at 24-week follow up. Participant's self-reported paranoid ideation is the primary outcome. Secondary outcomes include measures of other clinical symptoms, recovery and interpretation biases.

Results: We will present the study protocol and a recruitment update. The study has a 22-month recruitment phase, which began in October 2022 and is scheduled to end 2024.

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Discussion: This study will evaluate if STOP is an effective and safe intervention. If proven effective, STOP may be an additional accessible, low-cost psychological treatment for paranoia.

Pioneering artificial intelligence in automating the material development process of CBM for depression

Presenter: **Che-Wei Hsu**, University of Otago

Depression is significantly debilitating. People with depression tend to interpret everyday events through a negatively biased lens, which contributes to symptomatology. Cognitive bias modification (CBM) reduces negative bias through reading scenarios common to depression but enforcing a positive interpretation. The development phase of CBM, however, is onerous and resource-intensive. Here, we explored automation of the development process by using ChatGPT4.0, an artificial intelligence (AI) chatbot, to create CBM scenarios of depression. Adults with experience of depression (N = 13) created 55 raw items, which included scenarios and interpretations of their everyday experiences; ChatGPT was instructed to generate 55 items reflecting experiences of depression. The items were then modified into CBM format, one-half by humans and one-half by AI. Items were presented blindly in randomised order to participants; one group (n = 30; MYrs of depression = 11) rated the raw items and another group (n = 30; MYrs of depression = 8.8) rated the CBM items on a 7-point scale using criteria, commonality to depression, readability, and the degree of negativity-to-positivity of interpretations. A series of Two One-sided Test revealed statistically significant equivalence between human-generated and AI-generated items across all rating criteria ($p < .05$), with supporting evidence from non-significant Independent t-tests ($p > .05$). Our findings demonstrated that ChatGPT may generate scenarios akin to human experiences of depression and modify them into CBM format. The implications of our findings entertain the possibility of automating the onerous development process of CBM training materials to improve development efficiency and intervention effectiveness.

The randomised double-blind feasibility trial of a novel interpretation bias modification for depression: the CURED

Presenter: **Kaan Alp Karamanli**, King's College London

Objective: High prevalence and burdening costs of depression require immediate cost-effective and low-demand therapeutics that do not require therapist involvement. A novel six-session CBM-I therapeutic based on cognitive bias modification for cognitive errors (CBM-errors) have been developed, namely the CURED. This study aims to assess its feasibility, acceptability, and efficacy.

Method: The study will follow a double-blind 2 (Intervention / Control) x 4 (Measurement times) mixed design with repeated measures on the last factor. It is aimed to recruit 60 participants who meet the diagnostic criteria for DSM-5 Major Depressive Disorder. While the main outcomes will be measured at four time points (baseline, post-treatment, and follow-up at one month and three months after the last training session), some measures will also be delivered after each training session (6 measurements in total). The primary outcome of the study is depressive symptoms. The secondary outcomes include measures of depressive and anxious symptoms, interpretation bias, cognitive measures (e.g., imagery and cognition), and feasibility and acceptability measures.

Results: The study protocol will be presented with a recruitment update.

Conclusion: The study will test whether STOP is feasible, acceptable, and efficacious. Based on its results, the study will pave the way for fully-powered randomised controlled trials, and eventually, for its dissemination to those experiencing depression.

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THEORETICAL AND METHODOLOGICAL ADVANCES IN UNDERSTANDING NEGATIVE INTERPRETATION BIAS AND ITS LINKS TO ANXIETY

Session type: **Symposium**

Time: Tuesday, July 23rd; 14.00-15.20

Location: Arts Two: Lecture Theatre

Chair: **Fran Meeten**, King's College London

Negative interpretation bias is a key maintaining factor of elevated anxiety. This symposium comprises four talks on theoretical and methodological advancements in our understanding of negative interpretation bias and its links to anxiety in both adult and child populations. First, Fran Meeten (KCL) will present two experiments (Study 1: N = 210; Study 2: N = 298) that examine the potential role of attentional control and resonance frequency breathing (RFB) in CBM-I training efficacy. Whilst training resulted in more positive interpretation styles, findings revealed no evidence that attentional control or RFB were associated with CBM-I efficacy. Next, Nathan Pond (Sussex) will present an experiment investigating the timeframe within which interpretations occur. Here, participants with high trait levels of worry were randomly allocated to receive subliminally presented CBM-I or a sham-training. The potential of subliminal training paradigms to modify biases will be discussed. Julie Ji (Plymouth) will present a cross-sectional study (N = 284) investigating anxiety-linked negative interpretation versus expectancy bias and their unique contribution to a measure of social anxiety. Findings indicate that both interpretation bias and expectancy negative bias independently predict social anxiety. Finally, Lauren Turner (QMUL) will examine the relationship between mental imagery and interpretation bias in the context of childhood anxiety. This research utilises data from a longitudinal cohort study (N = 849) of children and examines how negative and positive imagery may interact with interpretation bias to differentially affect anxiety symptoms. Bethany Teachman (UVA) will lead a discussion of findings and consider avenues for future research.

Examining potential mechanisms of interpretation bias modification

Presenter: **Fran Meeten**, King's College London

We present two studies examining potential mechanisms underlying cognitive bias modification of interpretation (CBM-I). Study 1 assessed whether individual differences in attentional control (AC) predicts CBM-I efficacy. Participants (N = 210) with high trait worry scores completed an AC assessment, after which they were randomly allocated to either a positive or a sham CBM-I training. Interpretation bias (IB) was assessed via a behavioural task, the Recognition Test, before and after training. Findings revealed that CBM-I modified interpretations in a positive valence relative to control training. However, individual differences in AC were not significant predictors of CBM-I efficacy. Study 2 assessed whether the incorporation of resonance frequency breathing (RFB), a breathing regulation technique known to improve cognitive and physiological self-regulation, enhances the efficacy of CBM-I. Participants (N = 298) were recruited to complete a single-session, CBM-I study and were randomly allocated to either an RFB-adapted or standard positive CBM-I condition. RFB-adapted CBM-I consisted of implementing brief doses of RFB preceding IB training. RFB was found to reduce self-rated stress. Both types of CBM-I training resulted in sensitive evidence for the modification of interpretations in a positive valence direction. However, RFB did not enhance the efficacy of CBM-I. Future directions of this work will be discussed.

Can interpretations be modified using a subliminal training paradigm?

Presenter: **Nathan Pond**, University of Sussex

Negative interpretation bias is associated with pathological worry. Experimental interpretation bias modification (IBM) training programs are effective in the alleviation of both negative interpretation bias and worry. However, there is still debate regarding the

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automaticity of interpretation bias. As such, more research is needed looking into the time frame within which interpretations occur. The aim of the present study was to assess whether interpretation bias could be modified outside of conscious awareness. The sample was comprised of Psychology undergraduates from the University of Sussex, who had been screened for high levels of trait worry (PSWQ score > 56). Participants were randomised to either an experimental training paradigm or an active control. Participants in the experimental condition were subliminally presented positive resolutions to ambiguous scenarios, to see whether this would promote a more positive interpretational style. Participants in the active control condition experienced a sham-training in which they were subliminally presented with neutral resolutions unrelated to the ambiguity. Participants also completed pre- and post-training measures of interpretation bias and state anxiety. We will report on the efficacy of subliminal IBM training in promoting a more positive interpretation style and reducing levels of state anxiety. We will also discuss the implications of these findings on our understanding of the automaticity of interpretation bias. Future research directions will be discussed.

Investigating anxiety-linked negative interpretation versus expectancy bias

Presenter: **Julie Ji**, University of Plymouth

This talk will present a cross-sectional study (N = 284) that investigated anxiety-linked negative interpretation versus expectancy bias. While anxiety is associated with negative biases in both self-reported interpretation and expectancy, prior research has not delineated the independence of these associations. This study created two matched versions of a scenario-based self-report measure to test the degree to negative biases in the interpretation of ambiguous social situations, and negative biases in action-contingent expectancies concerning social outcomes, independently predict social anxiety. Results indicate that both interpretation bias and expectancy negative bias independently predict social anxiety, although interpretation bias explains negligible additional variance over and above expectancy bias. The study also revealed the interpretation measure, but not the expectancy measure, was associated with a behavioural measure of interpretation bias, although further validation is warranted due to low internal reliability of the behavioural task.

The potentially moderating role of mental imagery in interpretation bias and childhood anxiety

Presenter: **Lauren Turner**, Queen Mary University of London

Interpretation bias modification training tools provide a solution for reducing anxiety in adults, and more recently have been extended to children and young people in a preventative context. However, effects on interpretation and clinical change have been inconsistent across studies. In adults, there is a suggestion that enhancing mental imagery capacity can deepen processing and boost the effects of training on modifying interpretational biases. This raises questions over whether: a) a stronger capacity to imagine positive events in detail interacts with positive interpretations to reduce anxiety symptoms and b) a stronger tendency to imagine negative events in detail could interact with negative interpretations to increase anxiety symptoms. This research will test these hypotheses amongst 7- to 11-year-olds, as this is a crucial period in development when linkages between cognitions and anxiety symptoms may be stabilising. We will use data from the Development of Emotional Resilience (DEER) Study, a longitudinal cohort study of 849 children living in East London. We will explore main and interaction effects of interpretation bias metrics from the Ambiguous Story Paradigm and subscales of the Prospective Imagery Task of positive and negative future mental imagery capacity on anxiety symptoms, as assessed using the Revised Child Anxiety and Depression scale. We anticipate that our findings will have implications for the literature regarding the potential role of mental imagery in boosting positive outcomes of interpretation bias modification training on childhood anxiety. Data have already been collected and we plan to complete the analysis by the end of May 2024.

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THE DUAL-PROBE PARADIGM – ASSESSING ATTENTION BIASES
Session type: Individual Oral Presentations
Time: Tuesday, July 23 rd ; 14.00-15.20
Location: Bancroft: 1.13 classroom
Chair: Julian Basanovic , University of Exeter
Two probes, infinite possibilities: a reliable and sensitive assessment of anxiety-linked attentional bias using the Dual-Probe paradigm
Presenter: Mahdi Mazidi , The University of Western Australia
<p>Objective: Cognitive models contend that biased attention to negative information plays a key role in the development and maintenance of elevated anxiety vulnerability. However, two main limitations of the conventional approaches, such as the attentional probe task that is most commonly used to assess attentional bias, are their impoverished stimuli and poor reliability. The current study examines the psychometric properties of a new attentional bias assessment task based on the dual-probe paradigm and tests if the new task can sensitively detect anxiety-linked attentional biases to negative information.</p> <p>Method: 169 students who vary in their anxious disposition from the University of Western Australia’s student pool completed the attentional assessment task, which consists of 24 video-pairs in each two talking heads presented general positive and negative information about different topics.</p> <p>Results: The new attentional bias assessment task indicated excellent internal reliability (split-half reliability of .91) and a significant positive correlation was found between attentional bias to negative information and participants’ anxiety vulnerability.</p> <p>Conclusion: The current study provides an accessible, easy-to-use, and reliable attentional assessment task that is sensitive to individual differences in anxiety vulnerability. The findings of this research have important theoretical and practical implications for a reliable and sensitive assessment of anxiety-linked attentional biases. The use of such video stimuli within future studies adopting this dual probe attentional assessment approach will enable researchers to rigorously test more precise hypotheses concerning the attentional basis of elevated anxiety vulnerability and many other clinical conditions too.</p>
Attentional bias towards alcohol advertising causally impacts alcohol consumption through its effect on craving
Presenter: Daniel Rudaizky , Curtin University
<p>Previous research has established an association between exposure to alcohol advertising and increased alcohol consumption. However, the impact of advertising on consumption is varied between individuals suggesting individual differences in cognitive mechanisms, such as attentional biases, may influence susceptibility to advertising. This study employed the dual probe task, a methodologically innovative approach with enhanced psychometric properties, to manipulate attentional bias both towards, and away from, alcohol versus non-alcoholic beverage advertising in a sample of undergraduate students. Methodological enhancements addressed limitations of previous studies by introducing measures to assess preferential craving and consumption of alcohol relative to soft drinks and by testing a mediation model to examine the influence of attentional bias on alcohol consumption through its effect on craving. The results supported the hypothesis that attentional bias for alcohol advertising predicts increased alcohol consumption mediated by disproportionate craving, highlighting the potential of targeting attentional bias in interventions. The study underscores the importance of understanding cognitive mechanisms behind the impact of alcohol advertising on consumption patterns.</p>

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Cognitive mechanisms that underpin the tendency to experience heightened state anxiety responses to, and adaptive preparation for, impending stressors

Presenter: **Sienna Zimpel**, The University of Western Australia

Objective: Exposure to impending stressful events are inevitable occurrences in life that serve to evoke varying degrees of heightened state anxiety and engagement in adaptive preparatory responses to mitigate the threat. Understanding these individual differences is crucial as a disproportionate tendency to experience such responses can adversely impact ones emotional and situational well-being. Two psychological mechanisms, attentional bias to negative event-related information (AB-N) and negative thinking, may contribute to variations in heightened anxiety responses. Similarly, attention bias to preparation utility information (AB-PU) and constructive thinking may influence differences in adaptive preparatory behaviours. This study aimed to explore whether these mechanisms play a role in heightened anxiety and adaptive preparation for upcoming stressful events, which no prior research has sought to investigate.

Method: Forty-nine psychology students prepared for a stressful event, a quiz task, after viewing videos depicting emotionally negative vs benign aspects of the task. Attentional bias was measured using a dual-probe approach, evaluating negative (AB-N) and preparatory (AB-PU) biases. Participants' preparatory behaviour, state anxiety, and constructive and negative thinking were also assessed.

Results: Analyses revealed an association between heightened state anxiety responses and AB-N, mediated by negative thinking. No association was found between AB-PU and adaptive preparatory behaviour, however constructive thinking was associated with adaptive preparatory behaviour.

Conclusion: This research not only enhances our understanding of mechanisms contributing to heightened state anxiety and engagement in adaptive preparatory responses to impending stressors but also holds promise for developing interventions to improve emotional and situational well-being.

The role of attentional biases underpinning individual differences in emotional resilience

Presenter: **Hannah Abdul Razak**, The University of Western Australia

Objective: Facing adversity is a normal aspect of the human experience. However, there are large individual differences in how people emotionally cope following exposure to adversity. Emotional resilience refers to one's ability to demonstrate more positive emotional outcomes than expected in relation to the adversity experienced. Theorists have proposed that this inter-individual variation in emotional resilience may arise from differences in attentional bias processing. This study tested the hypothesis of whether emotionally resilient individuals have higher attentional bias alignment, in that they show greater attentional bias for threat that they can control, relative to threats they cannot control.

Methods: Undergraduate participants completed a modified dual-probe task, assessing participants' attention bias towards threat cues signalling an impending danger. Additionally, to permit assessment of attention bias alignment, participants can avoid exposure to a danger predicted by the threat cue in some blocks but not others. Alignment is indexed using the difference in attentional bias towards threat cues between these block types. Participants' emotional resilience was also assessed.

Results: Our findings support the hypothesis that emotionally resilient individuals demonstrate higher attentional bias alignment, by attending to threat cues more when avoidance of danger is possible relative to when it is not possible.

Conclusion: These findings contribute to current theoretical understandings of emotional resilience, suggesting that the ability to adaptively attend to threat only when control is possible may be a key factor in promoting emotionally resilient outcomes.

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Attentional bias and biased choice when viewing dynamic feared-stimuli: A test of the dual-probe paradigm in spider fear

Presenter: **Julian Basanovic**, University of Exeter

Objective: The “dual probe” task (Grafton et al., 2021) has demonstrated reliable measurement of anxiety-linked attentional biases to dynamic negative and non-negative information (e.g., people talking of emotional experiences). However, its reliability and validity in other emotion domains is yet to be explored. This study adapted the task spider fear, by examining spider-fear, attentional bias to spider videos, biased choices in viewing spider videos, and internal reliability.

Method: Experiment 1 - 120 participants who varied in self-reported spider fear completed a dual probe assessment task presenting videos of spiders and butterflies. Visual probes were randomly briefly presented in each video location, which participants discriminated. The proportion of probes discriminated in the location of spider videos indexed attention bias. Experiment 2 - 130 participants who varied in self-reported spider fear completed the same task, but also completed trials asking them to “choose” which video they would like to watch. The number of spider videos chosen indexed biased choice.

Results: Experiment 1 revealed that greater spider-fear predicted greater attentional avoidance of videos of spiders as compared to butterflies. Internal reliability of the attention measure was excellent. Experiment 2 replicated the findings of Experiment 1, and revealed that greater spider-fear predicted greater deliberate choice to avoid viewing videos of spiders as compared to butterflies, and attention and choice biases were strongly correlated.

Conclusion: This study indicates that the dual probe task can reliably measure fear-linked attention biases, but that the measure may sometimes reflect deliberate viewing choices rather than unconscious attentional patterns.

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ASSESSING COGNITIVE BIASES IN DEPRESSION
Session type: Individual Oral Presentations
Time: Tuesday, July 23 rd ; 15.40-16.40
Location: Arts Two: Lecture Theatre
Chair: Jeremy W. Pettit , Florida International University
Anhedonic versus dysphoric cognitive profiles for depression: a latent profile analysis of attention, processing, and memory biases for positive versus dysphoric stimuli in depressed individuals
Presenter: Kean J HSU , National University of Singapore
<p>Background: Cognitive theories of depression suggest biased attention, processing, and memory for emotional information play a role in the pathophysiology of depression. Yet most work in this domain examines these cognitive biases in isolation and between groups. Such approaches make it challenging to understand the different patterns of cognitive biases for positive and dysphoric information expressed by depressed individuals.</p> <p>Methods: We used latent profile analysis to identify cognitive profiles based on measures of attention, processing, and memory for positive and dysphoric stimuli. Measures employed behavioral, eye tracking, psychophysiological, and computational modeling approaches. Participants (N = 202) were adults (ages 18-35) ranging from mild to severe depression severity. We employed a data-driven, machine learning (elastic net) approach to identify the best predictors of latent profile membership from demographic and clinical variables.</p> <p>Results: When looking at positive and dysphoric stimuli together, no latent profiles emerged. However, two latent profiles each emerged when looking at cognitive processes for positive versus dysphoric stimuli. Although depression symptom severity was predictive of profile membership for dysphoric stimuli, anhedonia was not predictive of profile membership for positive stimuli.</p> <p>Conclusions: This work suggests that cognitive processes for dysphoric versus positive stimuli ought to be considered separately and that some cognitive profiles may be associated with greater depression symptom severity. Future work ought to examine the temporal stability of these cognitive profiles, how they replicate in more transdiagnostic samples, their association with measures of reward-related processes, and their role in predicting response to treatment, especially computerized cognitive interventions.</p>
Temporal paths of risk for depression: a multi-wave longitudinal study on the role of negative biases and mechanisms of regulation of negative and positive emotions
Presenter: Alvaro Sanchez-Lopez , Complutense University of Madrid
<p>Objective: Negative attention and interpretation biases are considered core mechanisms of emotion dysregulation, which would ultimately lead to depression onset. However, most evidence supporting this model is cross-sectional and existing longitudinal research has been limited to the study of the mediating role of the use of strategies aimed to regulate negative affect (e.g., negative rumination). In this longitudinal study, we tested the predictive role of negative biases in subsequent temporal increases of depression via its influence in the use of strategies implicated in the regulation of both negative and positive affect.</p> <p>Method: A total of 184 participants were evaluated across 3 assessments (baseline, 1.5 month- and 3-month follow-ups). Negative attentional and interpretation biases were assessed at baseline with the eye-tracking-based variant of the scrambled sentence task, whereas the use of emotion regulation strategies (negative and positive rumination, reappraisal, positive dampening), stress perception and depression levels were assessed across the 3 times.</p> <p>Results: Structural equation modeling supported that higher negative attention and interpretation bias levels at Time 1 were significantly related and predicted increases in</p>

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depression from Time 1 to Time 3, via their influence in higher levels of use of negative rumination and lower levels of use of positive rumination in Time 2. Negative and positive rumination acted as separate mediators, above and beyond the influence of temporal increases in perceived stress.

Conclusion: This study provides consistent evidence on the role of negative biases as risk factors for depression and identify different regulatory paths through which such influence occurs.

When expectations meet real life experiences: The moderating role of interpretation inflexibility in predicting depressive symptoms

Presenter: **Shimrit Daches**, Bar Ilan University

Objective: Dysphoric individuals might feel better when their negative expectations are not met in real life. However, cognitive theories posit that depression is characterized by a negative and inflexible interpretation thinking style that could interfere with the possibility that surprising outcomes ('prediction errors') can make one feel better. This study examined whether a favorable prediction error will predict a change in depressive symptoms over time and whether negative interpretation inflexibility moderates this association.

Method: Two hundred individuals recruited from an online crowdsourcing platform participated in a longitudinal study with three assessment points. At each point, participants self-reported depressive symptoms and completed a task assessing negative interpretation inflexibility. In addition, at Time 1, participants completed a checklist assessing expected negative social interactions for the next three weeks. Three weeks later (Time 2), participants completed a checklist assessing both experienced (in the past three weeks) and expected (for the next three weeks) negative social interactions. Finally, three weeks later (Time 3), participants completed a checklist assessing negative social interactions they had experienced in the past three weeks.

Results: Participants with greater prediction errors reported decreased depressive symptoms over time. Negative interpretation inflexibility moderated the effect of prediction errors on the change in depressive symptoms only from Time 1 to Time 2, suggesting that more flexible individuals might benefit more from unexpected favorable experiences under some conditions.

Conclusion: Unexpected favorable experiences may have a role in lowering depressive symptoms. However, an inflexible thinking style might interfere with this positive outcome.

In favor of negativity: exploring attention bias across lexical and photographic stimuli and its link to biased interpretations

Presenter: **Sumeyye Ozkaya**, Queen Mary University London

Objective: Previous studies, using various methods, support the key role of biased attention and interpretation processes in affective disorders. In line with this, there is a rapidly growing body of research attempting to understand the link between these cognitive biases. This study aims to examine the similarities in the occurrence of attention bias during exposure to both lexical and photographic emotional information, as well as its association with the interpretation bias towards the same information.

Method: Attention biases in subclinically depressed participants were tested via eye-tracking during the Scrambled Sentences Task (SST), which primarily measures interpretation bias using lexical stimuli. Additionally, participants completed a free-viewing eye-tracking task with negative, positive and neutral emotional facial expressions.

Results: The results showed that the dwell time for sad facial expressions in the free-viewing task, as well as for negative words in the SST, were both significantly predicted by current depression levels. Correlations were found between the dwell time results from both attention bias tasks and the interpretation biases in the sample.

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Conclusion: Attention bias towards different types of stimuli seems to correlate in subclinically depressed individuals. Moreover, regardless of the type of stimuli, an association between interpretation and attention biases is observed, supporting the connection between these processes.

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EMOTION-RELATED COGNITIVE BIASES – ASSESSMENT AND MODIFICATION
Session type: Individual Oral Presentations
Time: Tuesday, July 23 rd ; 15.40-16.40
Location: Bancroft: 1.13 classroom
Chair: Marcella Woud , The University of Göttingen
Lonely minds: Facial emotion perception in loneliness across ages
Presenter: Ceyda Kiyak , University of East Anglia
<p>Introduction: Negative cognitive biases, such as a heightened sensitivity to negative facial emotions and social cues, are prominent in lonely individuals, potentially exacerbating their sense of isolation. This study examines the relationship between loneliness and facial emotion perception across age groups.</p> <p>Method: 300 participants (18-83 years) were divided into young (18-35 years old), middle-aged (36-62 years old), and older adult (63 years and above) groups. After completing the UCLA Loneliness scale, they performed age-matched facial emotion processing task which included 10-sec video clips morphing from neutral to full emotion expressions (happy, sad, fear). They stopped the video clip when detected an emotion (positive or negative).</p> <p>Results: The interaction between facial emotion and loneliness across different age groups was significant, $F(2, 291) = 13.8406$, $p < .001$. Post-hoc analyses revealed a significant difference in the perception of negative facial emotions between high lonely and low lonely individuals in the young and middle-aged groups, but not the old adults group. No significant effect of loneliness was seen for positive faces.</p> <p>Discussion: The results show that high lonely young and middle-aged adults detect negative emotions faster than low lonely individuals, whereas high lonely old adults do not display this bias. Thus, age-related cognitive changes, such as cognitive resilience, might mitigate the impact of loneliness bias on facial emotion processing.</p> <p>Conclusion: This study underscores the complexity of loneliness and facial emotion processing across age groups and highlights the need for further research into how aging influences facial emotional perception.</p>
The effect of peripheral information on the intensity of emotional responses depends on depression level
Presenter: Tamar Amishav , The Hebrew University
<p>This research examined the effect of peripheral information on emotional responses, and depression-related differences in this effect. In three studies, participants rated their emotional responses to neutral and negative target pictures (studies 1 and 2) or negative and positive pictures (study 3). The target pictures were presented alone or with negative and neutral peripheral pictures (study 1), or with negative and positive pictures (studies 2 and 3). As predicted, across studies, depressive symptoms were associated with more negative emotional responses to neutral or positive pictures when these were presented in the context of peripheral negative pictures as compared to neutral or positive peripheral pictures. This finding was consistent across studies, whether depression was measured as a continuous variable (studies 1 and 2) or as groups with high and low symptom severity (study 3). Contrary to predictions, positive peripheral pictures did not attenuate responses to negative target pictures, and depression did not moderate the effect of positive information on emotional responses. These results emphasize the ill effect that contextual negative peripheral information has on emotional responses of people with depressive symptoms and may assist in designing interventions to modify negative affective responses.</p>

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Theta burst stimulation to frontostriatal reward circuitry in young adults with depression changes functional connectivity relevant to positive affect

Presenter: **Erika E Forbes**, University of Pittsburgh

Depression is associated with diminished positive affect (PA), postulated to reflect disruptions to frontostriatal reward circuitry. Depression has also consistently been associated with higher activation in the dorsomedial prefrontal cortex (dmPFC), a region that potentially regulates PA through connectivity with the ventral striatum (VS). Low PA in depression may reflect excessive dmPFC-VS functional connectivity. We conducted an experimental manipulation to examine the potential to decrease dmPFC-VS functional connectivity through changing dmPFC function.

Theta burst stimulation (TBS) was applied to dmPFC in 29 adults with depression (79% female, Mage = 21.4, SD = 2.04). Using a randomized, counterbalanced design, 3 types of TBS were administered at different sessions (3 sessions total): intermittent (iTBS; potentiating), continuous (cTBS; depotentiating), and sham TBS (control). Neuronavigation using structural and functional MRI identified personalized dmPFC targets. PA and resting state fMRI were measured pre- and post-TBS.

Functional connectivity (FC) between the nucleus accumbens and dmPFC showed a significant condition (cTBS, iTBS, and sham) by time (pre- vs. post-TBS) interaction, with a decrease in FC caused by cTBS but not iTBS or sham TBS. PA and NA did not change with time (pre/post), condition (iTBS, cTBS, sham), or their interaction. For cTBS only, reduced FC pre/post stimulation was associated with increased PA.

Findings in this therapeutic manipulation support the hypothesized over-regulation of VS by dmPFC, indicate that frontostriatal modulation is related to mood change, and suggest a way forward for treating depression. Future studies should evaluate multi-session TBS to test clinical effects.

Potential intervention for emotion recognition biases in depression: Testing the effectiveness of Gamified Cognitive Bias Modification (GCBM) training

Presenter: **Rumeysa Kuruoglu**, University of Bristol

Background

Negative emotional processing biases in depression are well documented (e.g. Bourke et al., 2010) and are proposed to play a causal role in depression (Harmer et al., 2009). Penton-Voak et al, 2012 developed a CBM intervention targeting emotional expression perception but therapeutic effects are unreliable and weak. In this study, we developed and tested a new gamified version of CBM on mood outcomes.

Methods

In Study 1 we compared the GCBM and control groups to test the effectiveness of GCBM in changing the responses of participants to ambiguous facial expressions. In study 2 we compared the effect of CBM, GCBM, and the control on immediate mood outcomes with Immediate Mood Scaler (IMS).

Results of Study 1 showed that GCBM positively changed participants' responses to ambiguous facial expressions $b = 1.73$, $p < .001$. Study 2 showed that there is evidence that GCBM training results in significantly higher mood compared to the CBM and control conditions and, $p < .05$.

Conclusions

GCBM training did positively shift the participants' responses to emotional facial expressions and had a positive effect on mood. However, we lack evidence regarding whether this positive effect persists over a longer period. Given the importance of developing remote and cost-effective interventions for depression, future studies should test the effect of GCBM on mood longitudinally and also, recruit participants diagnosed with depression, as they constitute the actual target group for testing the effectiveness of GCBM.

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LOOKING ON THE BRIGHT SIDE: A KEY ROLE FOR INTERPRETATIONS

Session type: **Keynote lecture**

Time: Tuesday, July 23rd; 17.00-18.00

Location: Arts Two: Lecture Theatre

Speaker: **Colette Hirsch**, King's College London

Our daily lives are full of ambiguity and uncertainty. Some of us tend to draw positive conclusions from this ambiguity, but those suffering with anxiety and depression have a tendency to generate negative interpretations. After exploring the evidence for transdiagnostic negative interpretation bias, we will consider how this cognitive bias predicts and maintains anxiety and depression, with an understanding drawn from cognitive bias modification of interpretations (CBM-I) research. In keeping with the combined cognitive biases hypothesis, we will also consider how interpretation bias is influenced by, and influences, other cognitive biases to maintain anxiety and depression. More broadly, cognitive behaviour therapy (CBT) conceptualisations have a prominent role for interpretation bias, and CBT targets these negative interpretations via different techniques, such as negative thought records and behavioural experiments, whilst at the same time addressing other unhelpful biases. CBM-I can form another approach to reduce anxiety and depression in the longer term, with effects are mediated by changes in interpretation bias. Across these intervention types we will consider how modifying interpretation bias may influence other biases to reduce emotional distress.

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POSTER SESSION

Sunday July 21st, 16.00-17.00; Arts Two: Lecture Theatre – Foyer

Feasibility and acceptability of a new online interpretation training intervention to promote resilience in women treated for primary breast cancer

Anna Cartwright, King's College London

Objective: Resilience influences our ability to cope and adapt in the face of adversity. This study aimed to evaluate the feasibility and acceptability of a breast cancer tailored online cognitive bias modification for interpretation (CBM-I) intervention to promote resilience amongst breast cancer survivors.

Method: Using a mixed methods design, eligible adults who had completed active treatment for primary breast cancer were recruited. Those reporting significant anxiety (8+ on the Generalized Anxiety Disorder-7), depression (10+ on the Patient Health Questionnaire-9) and reduced resilience (68 or less on the Connor-Davidson Resilience Scale) were randomised to receive 10 sessions of either an active CBM-I intervention or a sham control, via a purpose-built online platform. Assessments of mood, resilience, and quality of life took place preintervention (T0), postintervention (T1) and 1-month (T2) and 3-months (T3) postintervention. To ensure the targeted mechanism was successfully modified, interpretation bias was assessed at T0 and T1. Feasibility was measured via rates of recruitment, retention, and adherence. Acceptability was evaluated using questionnaires and semi-structured exit interviews (N=16), which were transcribed and analysed using thematic analysis.

Results: Sixty-seven participants were randomised (CBM-I=35, Control=32), of whom 79.1% completed at least 50% of 8+ sessions and 74.6% completed the T3 follow-up assessment. Quantitative and qualitative data are currently being analysed.

Conclusion: Preliminary findings indicate that this online CBM-I intervention to promote resilience amongst breast cancer survivors is acceptable and feasible. Recommendations will be made regarding further optimisation and a full-scale randomised controlled trial, to assess the efficacy of the intervention.

Inferential Shift of Personal Events: Effects on Mood and Rumination

Baraah Abu-Saleh, Hebrew University of Jerusalem

This study explored the impact of inferential shifts on mood and rumination among 140 undergraduate students. Participants were randomly assigned to one of three conditions, and in all they described a feared negative personal event and made two causal inferences about it. In the negative-positive shift condition, participants first made a negative inference and were later encouraged to shift their inferential reasoning towards a more positive inference. In the positive-negative condition, the reverse order was employed counterweighting inferential flexibility with the direction of the shift. In the control condition, both inferences were negative. We assessed levels of inference negativity, negative mood and state rumination before and after the inferential shift task, and on the next day, assuming superiority of the negative-positive shift. As expected, findings indicated that shifting from a negative to a positive inference significantly improved mood and reduced rumination more than maintaining a negative inference or shifting from a positive to a negative one. Trait rumination did not moderate the effects of inferential shift on outcomes, suggesting that the beneficial impact of shifting from negative to positive inferences on mood and rumination is robust across individuals with varying levels of trait rumination. This study contributes to the understanding of the role of cognitive flexibility in emotion regulation, highlighting the potential for inferential shift interventions in mitigating negative mood and rumination.

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RELAX – REducing Levels of AnXIety - in pregnancy and after birth. Study protocol to determine whether a new online CBM-I training can prevent escalating anxiety in pregnant women and new mothers

Brittannia Volkmer, King's College London (IOPPN)

Anxiety in the perinatal period is very common and experienced in around 40% of pregnant women and new mothers. A key risk factor of anxiety is engaging in Repetitive Negative Thinking (worry and rumination). This randomised controlled trial, The RELAX Study has been developed to offer pregnant women with high RNT (RTQ-10 (trait) ≥ 28) and mild-moderate anxiety (GAD-7 < 15) a new online training consisting of 12 Cognitive Bias Modification for Interpretation (CBM-I) training sessions. 268 pregnant women of 16-28 weeks pregnancy gestation will be recruited online, or through community posters or NHS sites. Half of the participants will be randomly assigned to complete the RELAX training sessions over four weeks compared to an equal number of usual care control participants. Audio scenarios used in the training target uncertainties typical in pregnancy, plus non-pregnancy scenarios are those used in previous research. Scenarios offer a mix of targeting both aspects of RNT (worry and rumination) and have been informed by the situations faced by women with lived experience of perinatal anxiety. All participants will be followed up at 4, 8 and 36 weeks post-randomisation to assess anxiety and RNT before and after birth. Changes in interpretation bias and comparison between groups on other validated standardised measures will be collected, as well as demographic and pregnancy-related variables. The online platform has been built to deliver all aspects of this trial: <https://relax.healthmachine.io/> and recruitment is expected to continue until Summer 2024.

A Sigh for Sore Eyes? Attention Allocation to Obsession-Provoking Stimuli and Stimuli Reflecting Compulsion Completion

Dana Basel, Tel Aviv University

Objective: Research on attention allocation in OCD has exclusively used obsession-provoking threat stimuli, showing sustained attention over neutral ones. Recently, however, a study contrasting neutral stimuli with stimuli depicting the completion of compulsive acts (end-states stimuli), which is associated with a reduced anxiety (negative reinforcement), showed similar results. Yet, as relative to neutral stimuli end-state stimuli were also OCD-related, these results may still reflect obsession-related distress rather than relief brought on by stimuli signaling compulsion completion. Also, end-states stimuli were not systematically validated.

Method: we compared gaze patterns of clinically diagnosed OCD participants (OCD group); participants with clinically assessed anxiety disorders (AN group); and healthy individuals without any psychopathology (HC group), while freely viewing 2-by-2 matrices directly contrasting two threat and two end-state stimuli

Results: while the AN and HC groups demonstrated no difference in dwell time on threat vs end-state pictures, the OCD group allocated more attention toward the latter. All groups were more prone to fixate first the threat pictures. Task reliability was high.

Conclusion: Attention allocation in OCD may also be affected by cues signaling the completion of compulsive acts.

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The impact of attention bias alignment on experimental pain outcomes: A Virtual Reality approach.

Dimitri Van Ryckeghem, Maastricht University

Attentional processing is theorised to be a key factor in the experience of pain-related disability and development of chronic pain. Yet, although biased attention in people experiencing pain is supported by numerous studies, research findings are highly heterogeneous and the link with pain outcomes remains unclear. Inspired by recent calls for a dynamic and motivational view on attentional bias (i.e., AB) and the need for increased ecological validity in this area of research, current study investigated attention bias alignment using a newly developed virtual reality (VR) paradigm.

Fifty healthy volunteers executed a VR paradigm (PainFlex) allowing to investigate alignment of attention with contextual changes (i.e., absence or presence of pain-threat) using ecological valid and personal-relevant pain information (i.e., bodily sensations). In addition, participants performed a cold pressor task (in combination with a tone-detection-task) probing pain experience and task interference by pain.

Results indicated that participants showed increased detection accuracy when the approached side and the tactile location were congruent. Additionally, current findings provided evidence for pain-related attention bias alignment, indicating that the magnitude of attention bias depends upon the presence of pain threat. Contrasting our hypotheses, results did not support that attention bias alignment, predicted poor pain outcomes.

Overall, our study provides initial support for a dynamic and context-dependent conceptualisation of attention bias for pain information. This insight is pivotal for advancing our comprehension of the presence and magnitude of attention bias. Future research is however needed to address the role of attention bias alignment on poor pain outcomes.

A co-design approach to developing an online training (ShiftFocus) to support young people aged 16-25 to manage worry

Jessica Steward, King's College London

Background: Many adolescents and young adults experience anxiety and worry. We need new effective and accessible interventions for anxiety. Online interventions delivered via mobile apps enable young people to engage at a time and place of their choosing and can help them to apply the techniques when they are most needed in day-to-day life. Our previous research found our single session training increased control of worry in the short term. We built on this to develop a multi-session training app. We took a co-design approach to app development to ensure it met young peoples' needs. Methods: PPIE members with lived experience of anxiety and worry were aged 16-25 years old and from diverse backgrounds across the UK. There were four phases to app development; developing sessions, piloting sessions, developing UX design and building and tailoring the mobile app. Results: Feedback from PPIE consultations indicated that the mobile app should (1) be simple and aesthetically pleasing (2) be personalised to individual needs and preferences (3) support all learning styles (4) track progress (5) provide a sense of community & connection to others (6) provide guidance on post-session activities and (7) have clear rationale, aims and objectives. Implications: PPIE members brought unique expertise grounded in their lived experience of anxiety and worry. They were very valued members of the team, who were encouraged to give critical feedback at all stages. A highly iterative participatory co-design process enabled continuous feedback from PPIE throughout, ensuring their input is meaningful and key messages are installed.

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Cognitive Behavioral Therapy for Children and Adolescents: In Vivo Symptom Changes in Youth with Clinical Irritability and Anxiety

Lauren M. Henry, National Institute of Mental Health

While psychotherapy outcome research has examined the efficacy of cognitive behavioral therapy (CBT) transdiagnostically in youth with psychopathology, in vivo and naturalistic methods are needed to capture more granular symptom change. Here, we examined symptom changes over the course of CBT tailored to clinical irritability and anxiety using ecological momentary assessment (EMA). We hypothesize (1) anxiety symptoms will decrease during CBT for anxiety; (2) irritability symptoms will decrease during CBT for irritability; and (3) non-targeted symptoms (e.g., anxiety, depression, positive affect in irritable youth) will not change.

Forty youth ($M_{age}=11.23$, 37.5% female, 77.5% white) with disruptive mood dysregulation disorder or significant temper outbursts or irritable mood received 12 sessions of exposure-based CBT augmented with parent management training. One-hundred-twenty-one youth ($M_{age}=12.84$, 60.3% female, 71.9% white) with a primary anxiety disorder diagnosis received 12 sessions of CBT augmented with computer-based attention retraining. Pre-, mid-, and post-treatment, all youth completed a 7-day (3 prompts/day) EMA protocol probing anxiety (2 items), irritability (2 items), and depression (1 item) symptoms and positive affect (1 item). Using multilevel modeling, we examined in vivo symptom changes across treatment. Anger ($PE=-.276$, $SE=.098$, $p=.008$) and frustration ($PE=-.373$, $SE=.099$, $p<.001$) decreased during CBT for irritability (Naim et al., in prep). Analyses examining changes in anxiety, depression, and positive affect, and corresponding analyses examining symptom changes in CBT for anxiety are ongoing and will be ready to present at the ACBM conference. Results will inform transdiagnostic and tailored CBT for youth with clinical irritability and anxiety.

Attention Shifting Moderates the Association between Interpretation Bias and Anxiety in Youth

Margaret Modico, Florida International University

Objective: Theoretical models implicate interpretation bias toward threat in the development and maintenance of anxiety in youth. However, empirical findings are mixed, suggesting the presence of moderators.

Method: The current study examines attentional control and its components, shifting and focusing, as moderators of the relationship between threat interpretation bias and anxiety in $N=64$ clinic-referred youth ages 7 to 16 years ($M=11.7$ years; 47% female; 85.9% Hispanic) who met criteria for a primary anxiety disorder. Youth and parents completed ratings of youth anxiety severity (Screen for Child Anxiety Related Emotional Disorders – SCARED-C/P), and youth completed self-ratings of attentional control (Attentional Control Scale – ACS-C). Youth also completed an interpretation bias task (Children’s Opinions of Everyday Life Events – COELE).

Results: Attentional shifting, but not focusing, significantly moderated the association between threat-related interpretation bias and anxiety, $p < .05$, such that interpretation bias was positively associated with anxiety symptoms at high levels of shifting. A similar trend-level moderation effect was found for total attentional control.

Discussion: The current study is the first to identify a moderator of the association between interpretation bias and anxiety in youth. Findings hold implications for revisions to theoretical models and interventions that target interpretation and attentional processes in anxious youth.

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Daily dynamics of mood and inhibitory control: Naturalistic sampling via mobile-based applications

Reut Naim, Tel-Aviv University

Background: Inhibitory control is the ability to suppress behavioral responses that are against specific task goals. Research has linked impaired inhibitory control to increased psychological symptoms, however, these associations have yet to be measured in real-time, naturalistically. Using mobile-based applications, we examined in-vivo within-person associations between momentary mood and inhibitory control among a pediatric clinical sample of youth.

Method: Twenty youth (Meanage = 12.84; SD = 2.34; 40% female; 100% White), with a primary diagnosis of either attention deficit hyperactive disorder, anxiety disorder, disruptive mood dysregulation disorder, and oppositional defiant disorder completed the study. Participants completed “CALM-IT,” a gamified version of an inhibitory control task (required to hitting targets and avoiding non-targets), and “RATE-IT,” an ecological momentary assessment of mood symptoms, in a sequence, twice a day for a week. Data were analyzed using multilevel modeling.

Results: Target hit rate was= 92.21%; correct rejection rate was= 89.65%. Individual differences were observed in terms of variability for both mood and inhibitory control. Additionally, associations were found between momentary negative mood and performance, particularly reaction time, where momentary anger and grouchiness predicted more impulsive responses and a decreased ability to distinguish between target- to non-target in the task (β s <-0.002, ps < 0.04).

Conclusions: Findings suggest that measuring variables outside of the lab can capture participants' naturistic dynamics. Increased momentary negative emotional state was associated with decreased inhibitory control. Findings could advance treatment strategies by identifying inhibitory control as an important target for youth psychopathology, paving the way forward for personalized, technology-based interventions.

Transfer of Memory Bias Modification to Attention and Interpretation Bias

Sahika Dilgüsa, Radboud University

Objective: The combined bias hypothesis proposes cognitive biases interdependently contribute to the onset, development, and maintenance of emotional disorders. The current studies aimed to look at the influence of memory bias modification (MBM) training on attention and interpretation biases in non-depressed samples.

Method: In study 1, participants (N=83, Mage = 24.31/SD = 4.14, 79.5% female) completed one session of MBM by studying Swahili-Dutch word pairs and performing cued-recall across four training runs for either positive or negative words, depending on the condition. During the training trails, attention frequency and duration for each word pair was recorded. As a manipulation check recall was tested after the MBM. Attention bias and interpretation bias were assessed pre- and post-training with mouse contingent attention training task. In study 2, a four-day training paradigm will be tested to allow for exploration of clinically relevant effects.

Results: On study 1, training condition-congruent recall was found after MBM. After three training runs, participants in the positive training condition looked at positive stimuli for a longer duration and looked at negative stimuli for a shorter duration than participants in the negative training condition. MBM reduced negative interpretations in both conditions. Four days of training is expected to yield stronger transfer effects on bias.

Conclusion: The findings of Study 1 showed training the recall of emotional stimuli can lead to changes in attention and interpretation bias. Thus, the results supported the combined bias hypothesis. However, the transfer effect of MBM was short-lived, which might suggest intensive training is needed.

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Effects of Reversal Learning on Reward-Based Selection History in Depression- An Eye-tracking Study

Shani Lavi, Tel Aviv University

Objective: Anhedonia, a key characteristic of Major Depressive Disorder, has been recently conceptualized as an intricate dysfunction in reward processing. Recent research on reward based Selection History – the effects of prior reward learning on subsequent attention allocation – has shown that while depressed individuals exhibit intact (online) learning of stimulus-reward associations, corresponding shifts in attention allocation toward the associated stimuli (i.e., near-transfer effect) do not follow. This study aims to both replicate and further elucidate these findings using a reversal-learning paradigm.

Method: Participants with high (n=30) and low (n=30) levels of depression underwent a series of training sessions in which one type of neutral stimuli was associated with music, while the other type was not. This music-reward contingency was reversed half-way through the experiment. Attention allocation was assessed before, midway (before the rule change) and following training.

Results: Results revealed no group differences in dwell time on the target stimuli during training, both prior and after the rule-change. Near-transfer effects were observed only in the low-depression group at both assessment points (before and after the contingency reversal).

Conclusion: These findings serve as replication of prior research, showing once again that depressed individuals exhibit intact online reward learning, even after altering reward-stimuli contingencies, and yet fail to apply learnt associations in the absence of ongoing feedback.

Negative memory bias in individuals with childhood adversity: the role of emotional schema

Xiangshen Liu, Radboud University Medical Centre

Negative memory bias plays an important role in the onset and persistence of depression. Beck's influential Cognitive Model of Depression posits that 'depressive schemas', shaped by childhood adversity, may lead to the development of negative memory bias. In recent years, progress in cognitive neuroscience could help us examine more implications of this model. Studies in memory process have unveiled the interaction between the medial prefrontal cortex (mPFC) and the medial temporal lobe (MTL) as a potential mechanism underlying schema memory effects. Our project aims to investigate whether schema-related neural activity contributes to negative memory bias and how this relates to childhood adversity. In our pilot study, 31 healthy adults encoded 180 emotional pictures after exposure to sad music (schema activation by negative mood induction) and neutral (control task) music. Memory was assessed through a recognition task 24 hours after each encoding session. Preliminary results demonstrated the efficacy of our mood induction manipulation in eliciting participants' negative emotions. Furthermore, the activation of the negative schema tended to enhance memory for negative images more than for other valences. Building upon this paradigm, our ongoing MRI study intends to include 100 participants (healthy and subclinical population) with diverse intensities of childhood adversity and depression. They will perform memory encoding and retrieval tasks in the scanner, allowing us to directly examine activities in potential 'depressive schema' regions (mPFC, MTL, amygdala). This project seeks to advance our theoretical understanding of schema-based emotional memory and benefit the potential application in clinical fields.

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Training positive mental imagery to reduce worry

Yogini Sawjani, King's College London

Excessive, uncontrollable worry is the hallmark symptom of generalised anxiety disorder (GAD). This proof-of-principle study investigated whether an online positive imagery training can help terminate a stream of worry once it has commenced. Given evidence of the potential benefits of digital interventions, we tested two modes of delivery of the positive imagery training: one completely online (no experimenter guidance), the other via video call (with remote experimenter guidance). Ability to shift from worry to non-negative thoughts and maintain this focus was measured using a behavioural stop worry task. High worriers were randomly allocated to receive repeated training in replacing their worries with an unrelated positive image (active condition) or a control condition (time matched to the active conditions). Within conditions they were randomised to online or experimenter modes of delivery. After training participants completed a stop worry task (SWT) which involved a period of worrying followed by an interval of trying to stop worrying. The active condition was instructed to use the training to bring a positive image to mind to help them stop worrying. Participants' thoughts were repeatedly sampled during the stop-worry phase, and they indicated their valence (i.e., negative, nonnegative). The findings for this study are currently being analysed and will be available at the conference. If the preliminary findings demonstrate effectiveness of the online training, this could form a new CBM intervention to reduce worry in GAD and other populations.

Contextual memory loss of emotional events: neurobiological correlates and depression risk.

Yuko Hakamata, Toyama University School of Medicine

Contextual memory loss plays a critical role in depression psychopathology, increasing the development and recurrence risk. However, its underlying neural mechanisms remain unknown. We investigated contextual memory immediately and 24 h after encoding with visuoperceptual/spatial/temporal context of microevents where fearful (vs. neutral) faces appeared and explored its neural basis with functional magnetic resonance imaging during attentional distraction by fearful (vs. neutral) faces in 120 individuals, including 34 at risk of depression. We also examined whether contextual memory loss affects depressive symptoms through overgeneral autobiographical memory (OGM), a more remote form of contextual memory loss. Fearful (vs. neutral) faces disturbed visuoperceptual context memory immediately after encoding in at-risk individuals compared with non-at-risk individuals. The more the contextual memory declined, the more the amygdala's functional connectivity with the ventromedial prefrontal cortex (vmPFC) weakened. Contextual memory loss affected depressive symptoms, partially mediated by OGM. Encoding the visuoperceptual context might fail because of attentional distraction caused by negative stimuli appearing in an event, with weakened amygdala-vmPFC connectivity implicated in emotion-related attentional dysregulation. Contextual memory loss might increase the risk of depression by overgeneralizing autobiographical memory. Cognitive intervention to facilitate context encoding while inhibiting negative selective attention may prevent depression development and exacerbation.