



MDHS Graduate Research Conference 2020

Psychological Science Booklet

<https://mdhs.unimelb.edu.au/mdhs-graduate-research-conference-2020>

mdhs-grconference@unimelb.edu.au

MESSAGE FROM THE CHAIRS

Dear Delegates,

Welcome to the virtual inaugural Medicine, Dentistry and Health Science Graduate Research Conference 2020 (MDHS GR Conference), a student conference for all biomedical graduate research students that are part of the MDHS Faculty of the University of Melbourne. The organising committee is made up of members from 11 different student society across the MDHS faculty campus. The conference schedule consists out of 12 parallel session covering a variety of interesting topics and accommodating our student talks as well as national and international keynote speakers, Science Communication workshop and a Career Panel Discussion. This event was only possible due to the generous support of the University of Melbourne and the Graduate Student Association (GSA).

We hope that MDHS GR Conference will provide you with opportunities to listen to national and international leaders talking about their ground-breaking research in different biomedical fields and communicate your research to a broad scientific audience. Despite the fact that this conference will be virtually it will give you a unique chance to meet and network with peers from different research fields engage in discussions. We hope that the MDHS GR Conference will inspire you with new possibilities for your future career by listening to our invited speakers from academia and industry.

We wish you all the best for your presentation and hope you enjoy the event and get novel project ideas, career opportunities and new connections out of it.

Martha Blank & Alexander Anderson

(Chair & Deputy-Chair of the Medicine, Dentistry and Health Science Graduate Research Conference 2020)

GENERAL PROGRAM

08.00 - 08.15 Conference Opening & Welcoming Address

Professor Alex Boussioutas and Martha Blank

08.15 - 10.00 Session 1

10.00 - 10.30 Break

10.30 - 12.30 Session 2

12.30 - 13.00 Break

Virtual Socialise

13.00 - 14.30 Science Communication Workshop

Dr. Shane Huntington

14.30 - 16.00 Break

Virtual Socialise | Networking | Games

16.00 - 17.00 Careers Panel Discussion

A/Prof. Nicholas Opie | Dr. Danijela Miroso | Dr. Ashish Sethi
Dr. Maryam Hussain | Dr. Simranpreet Kaur

17.00 - 19.00 Session 3

19.00 - 20.00 Award Ceremony & Conference Closing

Martha Blank and Alexander Anderson

SCIENCE COMMUNICATION WORKSHOP



Dr. Shane Huntington

Dr. Shane Huntington has been providing consulting services in communication and strategy for over 20 years. As a successful broadcaster, business owner, academic and strategist he draws together experience from multiple sectors, offering clients a more detailed and analytical approach than competitors. Shane has trained thousands of people to communicate more effectively, especially in fields of research. His unique and engaging style has led to him delivering programs to some of Australia's most prestigious institutions.

CAREERS PANEL DISCUSSION



A/Professor Nicholas Opie

Synchron Founding Director and CTO
Co-Lab Head of the Vascular Bionics Laboratory, The University of Melbourne



Dr. Danijela Mirosa

Franchise Director of Oncology for the Oceanic Cluster
Takeda Pharmaceuticals



Dr. Ashish Sethi

Postdoctoral Research Fellow
Department of Biochemistry & Molecular Biology, The University of Melbourne



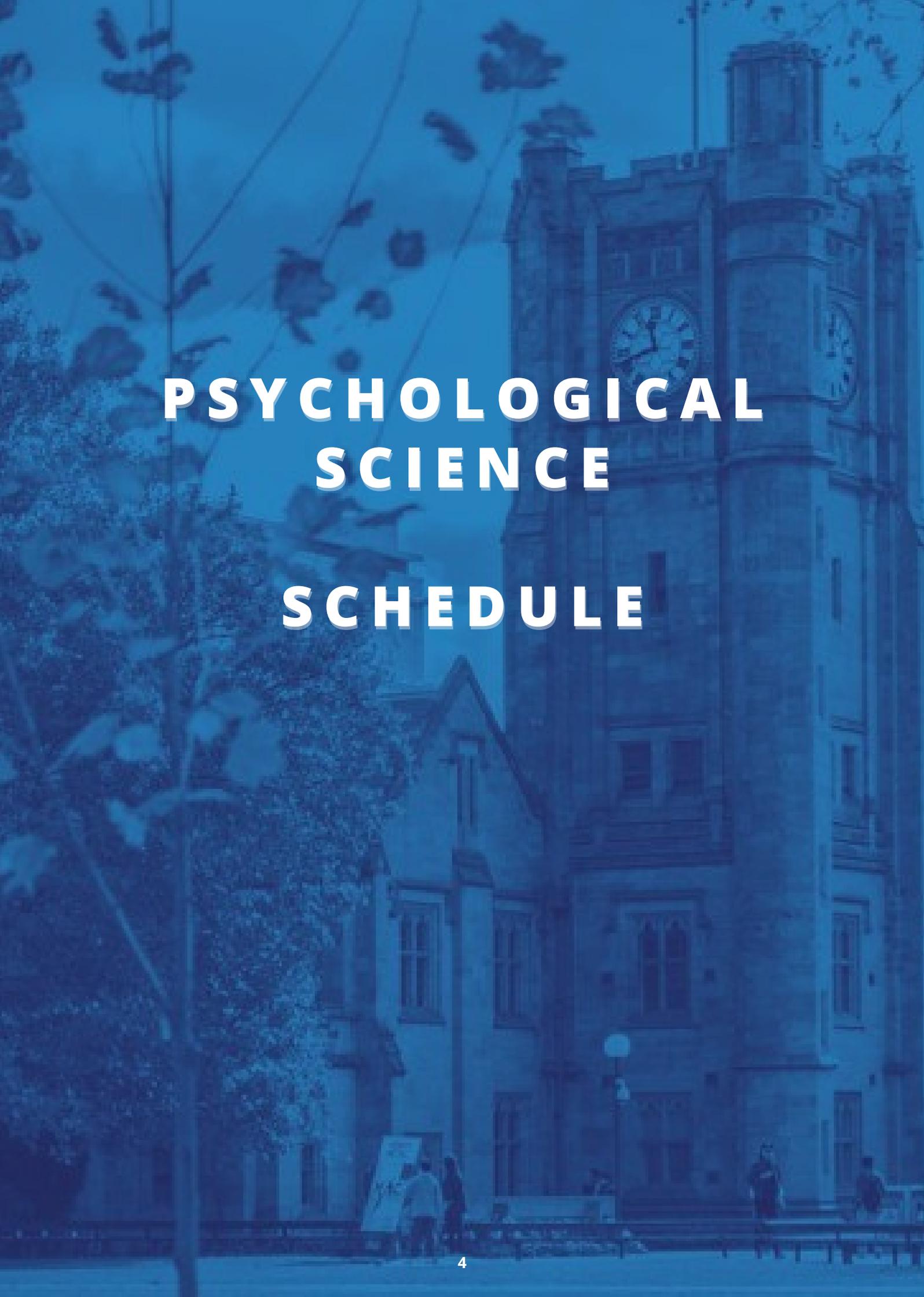
Dr. Maryam Hussain

Medical Science Liaison
Boehringer Ingelheim



Dr. Simranpreet Kaur

Postdoctoral Researcher
MitoBrain Murdoch Children's Research Institute



**PSYCHOLOGICAL
SCIENCE
SCHEDULE**

PSYCHOLOGICAL SCIENCE

SCHEDULE

SESSION 1

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SESSION 2

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PSYCHOLOGICAL SCIENCE

Keynote Speakers



A/Professor Kurt Gray
Center for the Science of Moral Understanding
University of North Carolina at Chapel Hill

Session 1 08.15 - 08.45 am

Kurt Gray is an Associate Professor at The University of North Carolina at Chapel Hill and an expert in how to study people's deepest beliefs and why they matter for society and organizations. He grew up in Canada, completed his BSc at the University of Waterloo and his PhD at Harvard with the late Daniel Wegner. He is the Director of the Center for the Science of Moral Understanding, which uses interdisciplinary science to bridge social divides.

A/Prof. Gray is the director of the Deepest Beliefs Lab, which investigates people's deepest beliefs across a range of areas, including beliefs long linked to conflict (morality, religion) and beliefs that are emerging alongside technology (AI). The lab also investigates the cognitive underpinnings of diverse beliefs (mind perception), innovative ways to study beliefs (new methods), and other phenomena including creativity and immortality.

The unifying moral dyad: Liberals and conservatives share the same harm-based moral template. Schein, C., & Gray, K. (2015). *Personality and Social Psychology Bulletin*, 41(8), 1147-1163.



Dr. Daniel Bennett
Princeton Neuroscience Institute
Princeton University
Dept. of Psychiatry
Monash University

Session 2 10.30 - 11.00 am

I'm a cognitive and affective scientist. I study mood, learning, and decision making, with a particular interest in how these processes go awry in psychiatric conditions like major depression and bipolar disorder.

I'm currently a Research Fellow in the Department of Psychiatry at Monash University and a Postdoctoral Research Fellow in the Princeton Neuroscience Institute at Princeton University. In my postdoctoral work, I worked with Yael Niv on computational modelling of mood and mood disorders using reinforcement learning models. I'm supported in this work by a CJ Martin Fellowship from the National Health and Medical Research Council and a Keith Murdoch Fellowship from the American-Australian Association.

In 2017, I received a PhD in Psychology from The University of Melbourne. In my PhD, I used neuroimaging and computational modelling to study human decision making under uncertainty, supervised by Stefan Bode, Carsten Murawski, and Rob Hester. My PhD work focused on the cognitive and neural processes that underlie information-seeking behaviours.

A model of mood as integrated advantage.

Bennett, D., Davidson, G., & Niv, Y. (under review). Manuscript under review, preprint available at PsyArXiv, <https://psyarxiv.com/dzsm/>

PSYCHOLOGICAL SCIENCE

Keynote Speakers



Professor Fiona Fidler
School of Biosciences
School of Historical and
Philosophical Studies
University of Melbourne

Session 2 12.00 - 12.30 pm

Professor Fiona Fidler is interested in how scientists and other experts reason, make and justify decisions and change their minds. She works on a wide range of metaresearch projects across ecology, conservation science, psychology and other fields. She has a degree in Psychology, with a second major in Sociology, and a PhD in History and Philosophy of Science. After a decade working in environmental decision research centres, Fiona is now a Professor at the University of Melbourne. Fiona is a current Australian Research Council Future Fellow. She is co-lead (with Professor Simine Vazire) of MetaMelb, a metaresearch group at the University of Melbourne, and she is lead PI of the DARPA funded replicATS project, Collaborative Assessments for Trustworthy Science.

Reproducibility of Scientific Results

Fidler, Fiona and John Wilcox, (2018) , The Stanford Encyclopedia of Philosophy URL<<https://plato.stanford.edu/archives/win2018/entries/scientific-reproducibility/>>



ABSTRACTS



PSYCHOLOGICAL SCIENCE

Punishing misogyny to regulate social hierarchies: preferences for hierarchical social arrangements predict reactions to sexual harassment

Morgan Weaving¹, Cordelia Fine¹ & Nick Haslam¹

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Why do public reactions to sexual harassment remain divided? In three studies (N = 902), we test whether hierarchical preferences can explain differences in judgements of sexual harassment. Building on system justification and social dominance theory, we argue that individuals who are motivated to maintain existing social hierarchies will treat male perpetrators of sexual harassment with leniency, and that this effect will be especially prominent when judging perpetrators of high social status. Using correlational and experimental vignette studies, we found that individuals who are high on gender system justification and social dominance orientation are more likely to view sexual harassment as unintentional and harmless and are less likely to blame and punish perpetrators (Studies 1, 2 & 3). Additionally, we find evidence that the effect of social dominance orientation on judgements of sexual harassment is moderated by perpetrator status: when judging workplace harassment, individuals high on social dominance orientation treat higher status perpetrators with greater leniency, whilst individuals low on social dominance orientation treat lower status perpetrators with greater leniency (Study 2). However, this interaction did not replicate when participants judged street harassment (Study 3). Taken together, these findings offer tentative support that people punish and blame sexual harassment to bolster or attenuate power structures, and to support their preference for social hierarchy or equality.



PSYCHOLOGICAL SCIENCE

Toward a Threat and Uncertainty-Based Account of Moralization: Insights from Individual Differences, and Experiences of Real-World Events

Joshua J. Rhee¹ & Brock Bastian¹

¹ Melbourne School of Psychological Sciences, The University of Melbourne, Victoria, Australia

Introduction: There is now widespread acknowledgement within popular discourse and academic research that the perceived moral significance of an issue is a key predictor of extreme partisan divides (Tappin & McKay, 2019). However, there is currently little consensus in the literature about the psychological mechanisms which motivate individuals to moralize issues or behaviours. To address this gap in understanding, we investigated the process of moralization from a value-neutral and functional perspective, looking specifically at its potential relationship with psychological responses to threat or uncertainty.

Methods: In three individual differences studies (N = 659), we investigated whether people who were generally higher in threat-sensitivity were more likely to morally condemn third-party actions across a variety of domains. We then investigated this relationship in terms of individuals' responses to the threat posed by COVID-19. Specifically, in two representative samples in the US (n = 800) and UK (n = 400) we investigated whether those who perceive COVID-19 as representing a greater threat to their personal health have a greater tendency to morally condemn third-party failures to adopt COVID-19 mitigating practices (e.g. avoiding large crowds). Finally, we investigated whether moral significance is indeed associated with greater decision confidence. In two studies (N = 300), we asked participants to write down five notable decisions they had made in the past year. For each decision, participants were then asked to rate its difficulty, whether it had ethical or moral relevance, and their confidence regarding the decision.

Results: We found a positive relationship between individual differences in threat sensitivity and the tendency to morally condemn third-party actions, which were not attributable to greater sensitivity to potential harm to others. In the context of COVID-19, we found that individuals who perceive COVID-19 as more threatening to their personal health had a greater tendency to morally condemn third-party failures to adopt COVID-19 mitigating practices. Importantly all aforementioned relationships remained robust even after controlling for self-reported social conservatism. Finally, we found that – among the decisions that participants had rated as most difficult – participants reported feeling more confident about the decisions that they indicated as having ethical or moral relevance.

Conclusion: Taken together, the above findings suggest a functional relationship between drives to moralize actions or decisions, and motivations to overcome perceived threat or uncertainty in one's environment. Our findings may have important implications for public policy, especially in terms of providing a non-partisan framework for public discourse on morality and polarization.



PSYCHOLOGICAL SCIENCE

Who Do You Want to Be Right Now? Examining Within-Person Variability in Trait Regulation Goals in Daily Life

Robert W. Rebele¹, Peter Koval¹ & Luke D. Smillie¹

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The present study aims to investigate how often and under what conditions people set goals to express different aspects of their personalities in daily life. Prior research has shown that most people hold goals to change various aspects of their personalities, yet little is known about how those goals manifest across a range of everyday situations. For example, someone who reports that they want to be a more extraverted person may want to generally be a bit more extraverted most of the time, or their goal may reflect a desire to be significantly more extraverted in relatively infrequent but nevertheless personally important situations. Given the well-documented and substantial within-person variation in personality expressions, it seems likely that most people will want to bring out different sides of themselves at different times. Accordingly, we hypothesized that there is substantial within-person variability in the degree to which people want to express each of the Big 5 personality traits in daily life. We tested this hypothesis in a sample of undergraduate students ($n = 70$) using ecological momentary assessment to measure trait regulation goals in daily life. Participants reported how much they wanted to express each of the Big 5 personality traits five times per day for 10 days, along with their concurrent mood, motives, situation, and recent personality states. As we hypothesized, most of the variance in trait regulation goals was attributable to within-person differences (proportion of within-person variance = 70-83%, depending on the trait). In other words, even highly extraverted individuals want to be fairly introverted sometimes, and vice versa. Further, exploratory analyses show diverging patterns of association between trait regulation goals and other momentary variables (e.g., people want to be more extraverted when they have social motives, but more conscientious when they have achievement motives). Taken together, these results show that the desirability of personality characteristics is dynamic, and they highlight the need for further research into the self-regulatory processes that enable people to bring out different sides of themselves at different times.



PSYCHOLOGICAL SCIENCE

Motion extrapolation in the flash-lag effect depends on perceived, rather than physical speed

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³ Department of Psychology, Faculty of Human Sciences, University of Cologne, Cologne, Germany

In the flash-lag effect (FLE), a flashed object in spatiotemporal alignment with a moving object is often misperceived as lagging behind the moving object. One proposed explanation for the illusion is based on predictive motion extrapolation and argues that the visual system constantly predicts the position for the moving object in the present moment, to compensate for the time required for neural transmission and processing. In this interpretation, the visual system uses an estimate of the object's velocity to generate a prediction, which implies that the FLE should rely on an explicit neural representation of velocity. By contrast, alternative explanations of the FLE based on differential latencies or temporal averaging should not be dependent on such a representation of velocity. Here, we test the extrapolation hypothesis by investigating the effect of illusory changes in perceived speed on the magnitude of the FLE in two experiments. In Experiment 1, we manipulated perceived speed by adding temporal noise to a rotating wedge stimulus, and in Experiment 2 we manipulated perceived speed by changing the luminance contrast of the wedge. We show for both manipulations, differences in perceived speed corresponded to differences in FLE magnitude: both perceived speed and perceived flash-lag increased when the wedge contained dynamic noise relative to static noise, and when it was presented in low relative to high contrast. Moreover, this effect was consistent across two different textures. Our findings therefore indicate that the FLE depends on an explicit neural representation of velocity, consistent with the motion extrapolation hypothesis.



PSYCHOLOGICAL SCIENCE

Decoding and Reconstructing the Remapped EEG Representation Before a Saccadic Eye-Movement

Caoimhe Moran¹, Ayelet Landau² & Hinze Hogendoorn¹

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² The Hebrew University of Jerusalem, Jerusalem, Israel

While subjective visual perception is rich in detail and remains stable as we move our eyes, the underlying process is dynamic. The visual stability we experience indicates that the brain can control for rapid saccadic movements, which would otherwise cause blur on the retina, and constantly changing retinotopic input. This has been attributed to the updating of retinotopic coordinates across saccades, also termed saccadic remapping. This theory suggests, that prior to a saccade, neurons currently representing a visual stimulus can predictively shift this representation to neurons whose receptive fields will encompass this stimulus after a saccade (He, Mo and Fang, 2017). However, there is an ongoing debate in the literature as to what this remapped signal contains. Is it a shift of attention from one population of neurons to another, meaning only spatial specificity is preserved (Cavanagh et al., 2010) or are features (e.g. orientation, motion, colour) also predictively remapped? In this study, to uncover the representational content of the remapped signal, we will employ multivariate analyses to raw EEG data to determine if remapped location and remapped stimulus features can be decoded and reconstructed.

Participants will perform a saccade task, including fixation trials and saccade trials, while covertly attending to oriented gabors presented at random locations around the computer screen. Simultaneously, EEG and eye-tracking will be recorded. EEG data collected during fixation trials will be used to train an Inverted Encoding Model (IEM) (Brouwer and Heeger, 2009). This model can spatially discriminate individual stimulus positions as well as differentiate between different orientations. Inverting the trained model allows us to reconstruct the remapped stimulus using EEG data collected during the saccade trials. This sheds light on the information contained in the remapped signal prior to a saccade.



PSYCHOLOGICAL SCIENCE

Behavioural outcomes of the female contraceptive pill; improving understanding for research and practice

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At any given moment, over 100 million women report using oral contraceptives and 85% of women have tried them at least once in their lives (Alvergne & Lummaa, 2010). Despite being the most widely used prescription medication in the world, very little research has addressed how contraceptives affect psychosocial behaviour. This paucity of research is highly problematic: we know that psychosocial behaviour changes depending on shifting ovarian hormones and that contraceptives suppress these same hormones (Hamstra et al., 2015). Understanding how contraceptives affect psychosocial behaviours - including those related to goal pursuit, status seeking and general competitiveness - is the key aim of my PhD research. With it I aim to educate women on how contraceptives are changing their bodies, behaviour and cognition.

Using three databases (PsychInfo, Web of Science, Medline) I have begun a systematic review of the psychological effects of oral contraceptives. The objective for this study is to provide a comprehensive review of how the pill influences affect, behaviour and cognition. Using the PRISMA guidelines, we identified over 1,000 papers, of which 188 have been reviewed and summarised into 370 key findings. The findings of the research will be discussed, including methodological limitations and key areas for future development. Further, I will discuss the potential impact on contraceptive users and the wider community."



PSYCHOLOGICAL SCIENCE

Neuropsychological methods for the pre-surgical lateralization of seizure foci in temporal lobe epilepsy: A systematic review and meta-analysis

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² Department of Clinical Neurosciences, St Vincent's Hospital Melbourne, Melbourne, Victoria, Australia

³ Department of Medicine, St Vincent's Hospital Melbourne, Melbourne, Victoria, Australia

Introduction: The resection of mesial temporal lobe structures is now considered a treatment of choice for the neurosurgical management of medication refractory temporal lobe epilepsy (TLE). The selection of suitable candidates for surgery is a complex process informed by a number of interacting clinical and pathological criteria. Part of the clinical criteria considered is the patient's preoperative cognitive profile as indicated on neuropsychological assessment. Neuropsychological methods are implemented to determine whether the pattern and level of cognitive function as demonstrated on cognitive testing is concordant with the seizure focus as demonstrated on other forms of pre-surgical investigation. Concordance suggests a greater likelihood of correctly identifying, and therefore resecting, the epileptogenic tissue causing the seizure activity, in turn increasing the probability of post-operative seizure freedom. Where the seizure focus as indicated by the preoperative cognitive profile is not concordant with other forms of pre-surgical investigation, the patient may be deemed unsuitable for surgery. Despite the clinical significance of neuropsychological assessment in the surgical decision-making process, to date, no systematic review has been conducted to examine the diagnostic validity of neuropsychological measures routinely used in clinical practice to lateralize seizure foci. The aim of this review was therefore, to quantitatively synthesize the literature on the diagnostic validity of neuropsychological methods for the lateralization of seizure foci.

Methods: A systematic review was conducted according to the PRISMA guidelines. A search of the electronic databases Medline, EMBASE and PsycINFO was conducted for all journal articles published between January 1990 and June 2020 (PROSPERO protocol registration number: CRD42018100330). Data extraction was conducted according to an adapted version of the Cochrane Data Extraction Template (Version 1.8; Cochrane Consumers and Communication, 2016). Meta-analysis was undertaken using Comprehensive Meta-Analysis software.

Results: 25 articles were eligible for inclusion. Neuropsychological methods used to lateralize seizure foci included measures of intellectual functioning, memory and language. Overall, neuropsychological methods yielded low diagnostic validity for pre-surgical seizure lateralization.

Conclusion: The results of the current systematic review and meta-analysis represent the first clear evidence for the diagnostic validity of neuropsychological measures in the lateralization of seizure foci, and strongly suggest that neuropsychological services may be better utilized in other areas of preoperative evaluation.



PSYCHOLOGICAL SCIENCE

Characterising the Gut Microbiome in Anxiety and Depression – A Systematic Review

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¹ Melbourne School of Psychological Sciences, The University of Melbourne, VIC, Australia

² Melbourne Neuropsychiatry Centre, The University of Melbourne and Melbourne Health, VIC, Australia

³ Orygen; Centre for Youth Mental Health, The University of Melbourne, VIC, Australia

⁴ APC Microbiome Ireland, University College Cork, Ireland † joint senior authorship

Introduction: Growing evidence indicates the community of microorganisms throughout the gastrointestinal tract, (i.e., gut microbiota), is associated with anxiety and depression. These are highly prevalent, comorbid affective disorders whose aetiology presently remains unclear. Whilst clinical studies in anxiety are sparse, an integrated investigation of the possible shared, underlying microbial features of both disorders may inform future diagnosis and treatment avenues. We present the first systematic review of the human gut microbiota in anxiety disorders, along with an essential update of recently published studies in depression.

Methods: A systematic search was conducted using the MEDLINE (Ovid), Embase Classic+Embase, PsycINFO, and PubMed databases to identify human case-control studies of gut microbiota in clinical anxiety (n=2), clinical depression (n=17) and co-morbid anxiety/depression (n=1), as well as cross-sectional associational studies with anxiety/depression symptom measures (n=6).

Results: Compared to existing reviews, 26 eligible studies provide evidence that alpha and beta diversity findings are inconsistent between anxiety and depression cohorts relative to controls. However, several taxa were consistently identified, including a lower abundance of Faecalibacterium and Prevotellaceae, and a higher abundance of Actinobacteria in clinical depression cohorts relative to controls. Clinical anxiety cohorts had a decreased abundance of Firmicutes, Ruminococcaceae, Prevotellaceae, Faecalibacterium, Subdoligranulum, Dialister, and Coprococcus; and an increased abundance of Bacteroides, Escherichia/Shigella and Enterobacteriaceae/Enterobacteriales relative to controls. These findings indicate that both disorders may be characterised by an increase in pro-inflammatory species, and a decrease in beneficial short-chain fatty acid producing bacteria.

Conclusions: Whilst diversity findings across studies are largely inconsistent, several taxa and their mechanisms of action, may relate to anxiety and depression pathophysiology via communication of peripheral inflammation to the brain. Although the gut microbiota remains a promising target for prevention and therapy, future research should assess potential confounding factors, particularly diet and psychotropics, and examine microorganism function."



PSYCHOLOGICAL SCIENCE

The Effects of News Story Content and News Medium Viewed on Stigmatisation of Schizophrenia

Kelton Hardingham¹, Chris Groot¹ & Nick Haslam¹

¹ The University of Melbourne, Melbourne, Victoria, Australia

Introduction: Numerous content analyses have found that the news media commonly depict schizophrenia in the context of crime and violence perpetration. However, there is a dearth of experimental literature examining whether viewing such news stories via television (audio-visual) versus internet (text-based) format, differentially affects the public's perceptions of persons with the disorder. Moreover, there is a lack of research examining how specific elements included in news reports may differentially affect stigma. Such features of concern include the presence or absence of schizophrenia's labelling and symptoms. The present study aimed to address these gaps in the literature.

Methods: The study was conducted in the format of an online experimental survey. The sample comprised of 741 undergraduate students. Participants were randomly allocated to view one of three news stories, presented in either television (audio-visual) or internet (text-based) format, meaning there were six experimental conditions. The first news story represented a 'with labelling/symptoms condition' that reported about an individual with schizophrenia who had committed a particularly violent crime. The second news story represented a 'without labelling/symptoms' condition, where the same story was reported, but this version omitted the label and symptoms of schizophrenia. The third news story was a control news story. After viewing one of the news stories, participants read a vignette about an individual with schizophrenia. Participants then responded to a range of questions about this vignette and about schizophrenia broadly. Overall, 23 facets of stigma were examined including stereotypes, emotions, distancing, structural discrimination, psychiatric treatment attitudes and criminal justice attitudes.

Results: A total of 23 (3 × 2) two-way ANOVAs were conducted to examine the impact of news story content (with labelling/symptoms, without labelling/symptoms and control) and news medium (television, internet) on stigma towards schizophrenia. There were no significant main effects of news medium, nor any significant interaction effects observed. However, 17 significant main effects of news story content were observed. In the majority of instances where a significant main effect of news story content was observed, news stories with labelling/symptoms and without labelling/symptoms significantly increased stigma compared to the control.

Conclusion: The results of this study indicate that news stories including and omitting the labelling/symptoms of schizophrenia cause similar increases in stigmatic responding. One reason for this finding may be due to the assumption that violent offenders in news stories have a mental illness. The study also suggests that television and internet news have negligible differential impacts on stigma.



PSYCHOLOGICAL SCIENCE

Association of psychological stress with risk of dementia: A systematic review and meta-analysis

Katherine Franks^{1,2}, Lisa Bransby², Michael Saling¹, & Matthew Pase^{2,3}

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² Turner Institute for Brain and Mental Health, Monash University, Melbourne, Victoria, Australia

³ Harvard T.H. Chan School of Public Health, Harvard University, Boston, MA, USA

Introduction: There is a need to identify modifiable lifestyle risk factors that may prevent or delay the onset of dementia, given there are currently no treatments. One proposed risk factor is psychological stress. Although many studies have investigated the association between stress and dementia, to our knowledge, no systematic review has examined this. The current study aimed to investigate the association between different aspects of psychological stress (including neuroticism, stressful life events and perceived stress) and the risk of incident dementia in middle-aged or older adults without cognitive impairment.

Methods: The study was prospectively registered and conducted in accordance with PRISMA guidelines. Three online databases were searched for eligible observational, prospective studies from database inception to October 2020. Pooled hazard ratios (HRs) were generated using a random-effects model to separately examine each aspect of stress in relation to the incidence of all-cause dementia and dementia due to Alzheimer's disease (AD).

Results: Of the 1607 studies screened, 16 (15 cohorts) were included in meta-analyses. The pooled HRs showed that higher perceived stress was significantly associated with an increased risk of all-cause dementia (Cases/Total N = 203/1,882: pooled HR = 1.44, 95% CI = 1.07 – 1.95). Exposure to two or more stressful life events (versus none) was also significantly associated with an increased risk of all-cause dementia (Cases/Total N = 3,352/11,597: pooled HR = 1.72, 95% CI = 1.14 – 2.60), while one or more stressful life events was not. Higher neuroticism was significantly associated with an increased risk of AD dementia (Cases/Total N = 497/4,771: pooled HR = 1.07, 95% CI = 1.01 – 1.12), but not all-cause dementia.

Conclusion: The outcomes from this review suggest that psychological stress in adulthood is associated with an increased risk of dementia. Further research is needed to clarify the mechanisms underlying these associations.



PSYCHOLOGICAL SCIENCE

Choosing to Know: Agency Increases the Value of Non-Instrumental Information

Matthew Jiwa¹, Patrick S. Cooper^{1,2}, Trevor T-J. Chong^{2,3,4} & Stefan Bode¹

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⁴ St Vincent's Hospital, Department of Clinical Neurosciences, Melbourne, 3065, Australia

Introduction: From the caloric contents of our favourite snacks, to the misdeeds of unknown celebrities, and our own genetic make-up, we now have more information available at the touch of a button – or swipe of a credit card – than ever before. Therefore, how we decide which information to view or avoid is of increasing personal, social, and commercial relevance. Recent research indicates that the propensity to reduce uncertainty, and the expected hedonic value of outcomes, are both key factors in determining whether information is worth pursuing. How contextual factors, such as the possession of agency, affect the computation of the subjective value of information remains an open question.

Methods: The present study investigated whether agency over choosing a specific but random lottery changed the value participants assigned to information about the lottery's outcome. This task allowed for the disaggregation of information from reward value because it could not be used to increase the magnitude or probability of future rewards (i.e., the information was "non-instrumental"). Participants completed a series of trials in which they bid proportions of their winnings in order to learn the outcomes of lotteries they had either chosen (lotteries they had agency over) or had been assigned (lotteries they did not have agency over).

Results: Results showed that having agency over which lottery to play significantly increased both the perceived probability of obtaining a winning outcome from the lottery and the subjective value of information about the outcome. Computational modelling indicated that this change in information-seeking behaviour was not due to changes in the subjective probability of winning, but instead reflected an independent effect of agency on the value of resolving uncertainty.

Conclusion: These results demonstrate agency to be an important source of value for the desire to obtain information, even when this information has no utility. The effect of agency on the subjective value of information may be attributable to an overlearning of the association between agency and the instrumentality or cognitive value of information.



PSYCHOLOGICAL SCIENCE

The effect of authenticity on conscious and unconscious emotion perception of happiness and disgust

Talina Bayeleva^{1,2}, Ilvana Dzafic¹ & Marta Garrido¹

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Introduction: Facial expressions are arguably one of the most prominent nonverbal communication methods and a fundamental way to express emotion. However, despite being more ecologically valid, authentic facial stimuli are not commonly used in research. Here, we present a study on authenticity of facial expressions and its effect on emotion perception. We investigated whether 1) emotion authenticity of unseen faces can bias emotion perception of subsequent faces, and 2) whether authenticity of seen faces can affect the intensity ratings of those images.

Methods: Stimuli were first validated in a separate experiment to ensure that the stimuli selection was unbiased and to confirm the emotion of each stimulus. Fifty participants (13 females) participated in the Validation task where they were asked to match authentic to posed images of the same actor. The most frequently chosen images were selected for the main, Subliminal Priming task.

For the Subliminal Priming task, 94 people (40 females) aged 18-65 were recruited. There were two types of trial structure. The first type included primes (happiness, disgust, neutral) and a neutral target image. This type of trials is designed to see how unseen primes affect the perception of seen targets. The second type only contained emotion targets, with no unseen primes. For both types of trials, participants were asked to rate emotion valence of seen target images. We also used inverted images to control for different physical features, such as an eye gaze direction.

Results: We found opposing results to previous literature about authenticity in consciously perceived faces, in that authentic emotion faces were rated as less intense than posed emotion faces. For the unconsciously perceived primes, only posed primes had an effect of neutral targets. Contrary to upward primes, inverted subliminal primes showed no effect of emotion on neutral targets. We suggest that the physical properties of primes did not bias emotion intensity ratings on neutral facial expressions. Indeed, we did find significant effects of emotion and authenticity on emotion intensity ratings for the inverted emotion targets. Suggesting that consciously perceived different physical properties influence emotion processing.

Conclusion: This study adds to sparse research on authenticity, especially for disgust. It showed that authentic images rated as less intense when perceived consciously. It also showed that authentic primes did not bias emotion perception of neutral target faces, suggesting that authenticity might be processed at the conscious level. However, this should be further validated in a separate study.



PSYCHOLOGICAL SCIENCE

Characterizing human safety learning via Pavlovian conditioned inhibition

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Introduction: Deficient safety learning has been implicated in the pathogenesis of anxiety disorders. Despite increased translational interest, there has been limited research on the basis of safety learning in humans.

Methods: We examined safety learning in seventy-three healthy participants via a modified Pavlovian conditioned inhibition paradigm, featuring a conditioned threat stimulus that was reinforced alone (A+), but not when combined with a second stimulus (the conditioned inhibitor, AX-). During a test phase, X and a control safety cue (C) were combined with a second threat stimulus to assess their inhibition of threat responses, measured via skin conductance (SCRs) and US-expectancy ratings.

Results: Both stimuli exhibited conditioned inhibition, but X suppressed ratings by a greater magnitude than C. Trait anxiety also predicted increased threat-expectancy ratings of the conditioned inhibitor.

Conclusions: These findings suggest that a Pavlovian inhibitor accrues greater safety value than a merely unreinforced safety signal. Conditioned inhibition paradigms may have utility in the ongoing characterization of safety learning and its relevance to anxious psychopathology."



PSYCHOLOGICAL SCIENCE

Predictive activation of hierarchical neural representations compensates for neural delays in visual motion perception

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Due to the time required for neural transmission and processing, the brain only has access to outdated sensory information. This is particularly problematic when localising a moving object; by the time sensory evidence of an object in a certain position is processed, the object will have moved past this position. Additionally, processing delays accumulate as information progresses through the visual hierarchy, such that information is increasingly outdated as it reaches later visual areas. Here, we investigated whether neural representations of moving objects are predictively activated, ahead of incoming sensory evidence, in order to compensate for these cumulative delays. We presented a circular stimulus in a 37-position hexagonal grid, either briefly flashed in individual positions or moving through the array along one of 42 motion vectors. Electroencephalographic (EEG) data was collected and analysed using multivariate pattern analysis. We trained classifiers to discriminate between different stimulus positions based on EEG activity evoked 50-200ms after flash onset, and then tested those classifiers on the motion trajectories. By looking at each training timepoint separately, we investigated when different hierarchical position representations were activated in response to the moving stimulus arriving at that position. We observed that early visual representations began to activate several hundred milliseconds before the arrival of the moving stimulus, while activation of later representations coincided with the arrival of the stimulus, ahead of incoming sensory information. This suggests that the brain can compensate for the delays that accumulate during processing by predictively aligning neural representations of moving objects in both space and time.



PSYCHOLOGICAL SCIENCE

Decoding explicit and implicit representations of health and taste attributes in the human brain

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Introduction: Visual food cues are constantly encountered in everyday life and are closely related to dietary decisions. The processing of these cues involves two key attributes: taste and health. Previous studies suggest that taste information is neurally encoded very early, during the first second of viewing a food cue, but it is unclear whether health information is also processed at this stage. This study therefore aimed to examine whether and when health and taste attributes are represented in the brain during the viewing of food images a) while making explicit health/taste judgements, and b) while implicitly considering food attributes for consumption decisions.

Methods: We used multivariate support vector regression to determine whether spatiotemporal patterns of event-related potentials occurring in the first 1200 ms after the presentation of a food image could predict ratings of tastiness and healthiness on a trial-by-trial basis. In Experiment 1, participants (N = 37) were directly instructed to rate the tastiness and healthiness of various food items. In Experiment 2, a different sample of participants (N = 89) viewed images of various foods and rated how strongly they would like to consume them (decision strength), with no explicit instruction to consider tastiness or healthiness. In both experiments, brain activity was recorded using electroencephalography (EEG).

Results: The results of Experiment 1 showed that taste and health ratings could both be predicted significantly above chance, with taste (from 530 ms) becoming decodable slightly earlier than health (from 640 ms). In Experiment 2, using the same analysis approach, we found that taste (from 740 ms) and health (from 530 ms) ratings could again be predicted significantly above chance, as well as decision strength (from 830 ms).

Conclusion: Taken together, our results suggest that taste and health information is decodable from electroencephalography data during dietary decisions, even when participants are not explicitly instructed to consider these attributes. This finding provides an exciting path for future studies to investigate potential alterations of taste and health representations following interventions, such as health warning messages, aimed at improving dietary choices.



PSYCHOLOGICAL SCIENCE

The time-course of prediction formation and revision in human visual motion processing

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Establishing the real-time position of a moving object poses a challenge to the visual system due to neural processing delays. While sensory information is travelling through the visual hierarchy, the object continues moving and information about its position becomes outdated. By extrapolating the position of a moving object along its trajectory, predictive mechanisms might effectively decrease the processing time associated with these objects. Here, we use time-resolved decoding of electroencephalographic (EEG) data from an apparent motion paradigm to demonstrate the interaction of two separate predictive mechanisms. First, we reveal predictive latency advantages for position representations as soon as the second object in an apparent motion sequence – even before the stimulus contains any physical motion energy. This is consistent with the existence of omni-directional, within-layer waves of sub-threshold activity that bring neurons coding for adjacent positions closer to their firing threshold, thereby reducing the processing time of the second stimulus in one of those positions. Second, we show that an additional direction-specific latency advantage emerges from the third sequence position onward, once the direction of the apparent motion stimulus is uniquely determined. Because the receptive fields of early visual areas are too small to encompass sequential apparent motion positions (as evidenced by the lack of latency modulation for the second stimulus position), this latency advantage most likely arises from descending predictions from higher to lower visual areas through feedback connections. Finally, we reveal that the same predictive activation that facilitates the processing of the object in its expected position needs to be overcome when the object's trajectory unexpectedly reverses, causing an additional latency disadvantage for stimuli that violate predictions. Altogether, our results suggest that two complementary mechanisms interact to form and revise predictions in visual motion processing, modulating the latencies of neural position representations at different levels of visual processing.



PSYCHOLOGICAL SCIENCE

Running away from your problems: The Mental health related barriers and benefits to EXercise (MEX) scale

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Introduction: Exercise has long been promoted as an effective mental health treatment. Yet, there is mounting evidence that poor mental health can hinder the practice of exercise – but it is not yet known exactly how or why. Similarly, the endorsed benefits of exercise by those with symptoms of anxiety and depression is not yet known. Here, we introduce the ‘Mental health related barriers and benefits to EXercise scale’ (MEX).

Methods: 900 participants were recruited through Amazon Mechanical Turk (final N = 758, 249 women, age: M = 32.7, SD = 5.9). Participants were provided with a Qualtrics questionnaire, which included the entire MEX scale, as well as measures of mental health and wellbeing and physical activity. Split-sample exploratory and confirmatory factor analysis was conducted with the MEX. For external validation, correlational analyses were conducted with the MEX and measures of mental health and wellbeing, and physical activity.

Results: A two-factor model was examined for the whole scale overall: a barriers scale and a benefits scale. Within each subscale, further subfactors were delineated from the barriers and benefits scales respectively. The barriers subscale was strongly correlated with scores on the DASS-42 ($r = .8$).

Conclusion: The MEX scale is a novel, validated scale, appropriate for clinical use in psychological settings where exercise may be a valid treatment.



PSYCHOLOGICAL SCIENCE

Effects of ageing on neural correlates of metacognition

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Introduction: Metacognitive accuracy describes the overlap between the subjective perception of a decision, often expressed in a confidence rating or an error detection judgement, and objectively observed performance, that is the correctness of a given response. Metacognition has been investigated in two separate but arguably related fields, namely in studies on error detection and in studies on decision confidence, which substantially differ in their methodological approaches. An essential purpose of being aware about the own performance is the adaptation and eventual improvement of behaviour. As older adults tend to become more prone to failures in every-day life, the need for effective metacognitive evaluation is especially enhanced with increasing age. In previous studies, older adults showed lower detection rates of committed errors and amplitudes of two classical event-related potentials (ERP) of error processing, namely the error/correct negativity (Ne/c) and the error/correct positivity (Pe/c), were attenuated. These ERPs have also been shown to reflect changes in decision confidence. However, neural correlates of confidence have not been investigated in the context of ageing yet.

Methods: In this study, we combined behavioural measures and electroencephalography (EEG) to assess the effect of ageing on metacognitive accuracy. We tested 65 healthy adults from 20 to 76 years, using a complex flanker task and a confidence judgement on a 4-point rating scale. Repeated measures ANCOVAs were computed to examine the effects of response accuracy and response confidence on behavioural (error rate, metacognitive accuracy, response time) and neural (Ne/c, Pe/c) parameters across the lifespan.

Results: As expected, metacognitive accuracy declined with age beyond a general decline in task performance. The Pe/c amplitude was modulated by changes in confidence, but this was stable across the lifespan, and did thus not mirror the behavioural decline in metacognitive accuracy. The amplitude of the Ne/c, on the other hand, decreased with age whenever participants were not entirely sure about the correctness of their response. This suggests that age-related difficulties in metacognitive evaluation could be related to an impaired integration of neural correlates of decision accuracy (Ne/c) and confidence (Pe/c).

Conclusion: Our results support the assumption that error detection and confidence are likewise reflected in changes in Pe/c amplitude, yet, they did not show an age-related decline as it was observed in metacognitive accuracy at the behavioural level.

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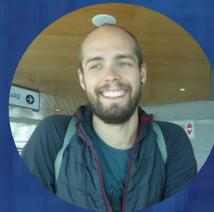
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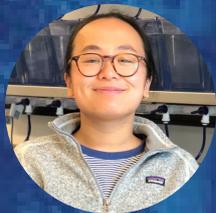
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