BPS Cognitive Section Conference

Book of Abstracts

Keynotes

Wednesday 10.30am

Kathy Rastle

Royal Holloway, University of London

Professor of Cognitive Psychology at Royal Holloway, University of London. I am interested in the mechanisms that underlie reading and reading acquisition, and have a strong interest in translating this research to improve how children are taught to read. My research has won prizes from the BPS Cognitive Section and the Experimental Psychology Society, and I recently won the ESRC 'Celebrating Impact' Prize for Outstanding International Impact. I am proud to serve as President of the Experimental Psychology Society and as Editor of Journal of Memory and Language.

Understanding Reading, Understanding Writing

Reading is one of the most well-studied phenomena in the psychological sciences. The literature on reading stretches back over 100 years and hundreds of new articles are published each year. However, this research has focused on a very narrow range of writing systems and a narrow range of words within those writing systems. I present several examples of instances in which reading systems reflect salient information present within writing systems. I argue that a full understanding of reading and reading acquisition requires us to think deeply about what writing is and the type of information that it conveys. I conclude by considering whether there is any evidence that writing systems are 'optimal' (or may have become more optimal) for skilled, silent reading.

Julia Simner

University of Sussex

Professor of Neuropsychology at the University of Sussex, UK. Her research focusses sensory differences such as synaesthesia, aphantasia, misophonia, savantism, and sensory sensitivities. She is currently funded by the ERC and Ream Foundation, and is particularly interested in raising the profile of sensory differences to improve the lives of children and adults. She is the Science Officer for the UK Synaesthesia Association, and has shared her work via public lectures, public-facing interactive websites, and scores of media articles worldwide. She has published around 100 peer-reviewed articles, and has written or edited definitive guides to her field (The Oxford Handbook of Synesthesia, and Synaesthesia: A very short introduction)

Jamie Ward

University of Sussex

Professor of Cognitive Neuroscience at the University of Sussex, UK. His research uses a wide variety of methods to explore the different ways in which people can perceive the world – including synaesthesia, sensory loss (e.g. blindness), and sensory intolerances (such as occur in misophonia and autism). He is the author of several textbooks including the Student's Guide to Cognitive Neuroscience and the Student's Guide to Social Neuroscience. He is the current president of the British Association for Cognitive Neuroscience (BACN).

Synaesthesia as Tool for Understanding Variation in the Mind & Brain

People with synaesthesia inhabit a remarkable mental world in which odours can be textured, words can have taste, and music can be a kaleidoscopic coloured spectacle in front of the eyes. Synaesthesia has now been documented for over two hundred years in psychology and neuroscience but key questions remain about why it exists, and what such conditions might mean for cognitive theories of the human mind. In this talk we will describe research from our labs spanning two decades, based on data from both adults and children, and both human and non-human animals. The research we describe demonstrates how cognitive processes can drive the experiences of synaesthetes, and in turn, shows how synaesthesia can be used as a tool to better understand different facets of cognition (such as language processing). We also reposition synaesthesia as a model for understanding broader variations in the construction of the human mind and brain. We place synaesthesia within a neurodevelopmental cascade from genes to brain to cognition, which gives synaesthetes a distinctive way of thinking - beyond synaesthesia itself (e.g., enhanced memory and imagery, but also clinical vulnerabilities and deficits). In other words,

instead of viewing synaesthesia as a kind of 'dangling qualia' (unusual experiences attached to a typical mind/brain) it should be thought of as unusual experiences that accompany an unusual mind/brain. It is this broad neurodiverse phenotype that is an important object of study in its own right, rather than synaesthesia alone, and it is this phenotype which likely explains any adaptive value of synaesthesia.

Thursday 9.30am

Monica Bucciarelli
University of Turin

Monica investigates the role of mental models in various sorts of reasoning, from how children and adults devise informal algorithms (to rearrange the order of the carriages in a railway train) to the inferences they draw from premises about moral principles. Her recent studies examine the relations between the strength of individuals' beliefs about what is right and what is wrong, and their emotional reactions to these beliefs. She is a professor of psychology in the University of Turin, Italy, and on the editorial boards of several cognitive journals.

Why are we so sure we are right?: The role of emotions in maintaining and revising beliefs

Beliefs about what is right or wrong are amongst the most divisive in everyday life, both between individuals and cultures. Moral beliefs can arouse emotions. This talk describes my studies of moral beliefs and other beliefs that concern right and wrong: deontic matters such as conventional social rules, prudential rules, and personal recommendations. The studies showed that strength of belief correlates with emotion, and in particular how pleasant or unpleasant an assertion is. But, the effect occurs only for deontic assertions, not for factual assertions with the same contents. Likewise, when participants recall a pleasant memory related to a deontic assertion, they believe in it more, whereas when they recall an unpleasant memory related to it, they believe in it less. Analogous causes can work in the opposite direction: reasons to believe, or else to disbelieve, a deontic assertion change participants' emotional reactions to it. So, deontic beliefs are sometimes slaves to passion, and deontic passions are sometimes slaves to belief.

Thursday 4.15 pm

Tom Stafford
University of Sheffield

Senior Lecturer in Psychology and Cognitive Science at the University of Sheffield, where he is also University Research Practice Lead and Director of the MSc in Psychological Research Methods with Data Science. His research interests are learning and decision making, particularly data intensive and computationally informed approaches to these topics.

For more information on his work:https://tomstafford.staff.shef.ac.uk/

Digital Disruption in Cognitive Psychology

Digital technology has changed how the world works, from the music industry to democracy. These changes have also come to cognitive psychology, challenging us to adopt new methods, learn new analysis techniques and adapt to new ways of relating to the participants in our experiments and to the users of our research. Using examples from my own explorations in open research, online research, public engagement and data intensive methods I will sketch the opportunities and challenges cognitive psychology faces.

Friday 10.15 am

Cognitive Section Prize Winner, 2022

Mauro Manassi
University of Aberdeen, UK

I got my Bachelor's degree in Psychology of Personality and Interpersonal Relationships at Padua University (Padua, Italy). Right before getting my Master's degree in Clinical Psychology (and starting a career as a clinical psychologist), I fell in love with everything that is about Perception and Visual Neuroscience. Since then, this is what I do and I love.

After my master thesis on motion priming under the supervision of Prof. Gianluca Campana, I joined Prof. Michael Herzog's Psychophysics laboratory at École Polytechnique Fédérale de Lausanne (Lausanne, Switzerland) for a PhD in Neuroscience (2009-2014). My PhD focused on how our visual system organizes the cluttered environment around us in a coherent manner.

At the end of my PhD, I was awarded of the Early Postdoc.Mobility fellowship by the Swiss National Science Foundation, for an 18 months postdoc in Prof. David Whitney's laboratory of Perception and Action at UC Berkeley (California, USA). Here, I have become interested in how our visual system stabilizes our visual interpretations of the world, turning discontinuous and chaotic retinal images into coherent visual percepts As of August 2019, I am a Lecturer (~Assistant Professor) in Psychology at the University of Aberdeen (UK).

David Whitney
University of California, Berkeley, CA, USA.

As an undergraduate, I majored in Economics, Philosophy, and Psychology. Although these are a seemingly disparate or even random set of fields, they are coherently bound together. All of these fields overlap in the sense that they all depend intimately on human perception. Economic choices depend, at the most fundamental level, on human perception and perceptual decisions. Similarly, the basis of many areas of philosophy is human perception. Psychology is the study of the mind, and all higher psychological and cognitive functions depend first on perception. Once I appreciated that perception was at the heart of my interests, I was hooked.

I pursued perception science in graduate school. I received a Master's and PhD from Harvard University in Psychology, specializing in Vision Science. Later, I was a postdoctoral fellow at the University of Western Ontario and then joined the faculty at UC Davis before moving to UC Berkeley in 2010 as professor.

My lab and I are broadly interested in perception science. What is "perception science"? Perception science is the investigation of "why we see what we see". What are the cognitive and neural mechanisms that make us experience the world as we do? I am broadly interested in a variety of topics in perception, including visual and visuomotor localization, motion perception, object recognition, perceptual and motor crowding, and visual impairments. In my lab, we use a variety of techniques, including psychophysics, functional magnetic resonance imaging (fMRI), and transcranial magnetic stimulation (TMS). One of my goals as a teacher is to show my students that perception science is all around them and relevant to every field, career, and avocation; they only have to look or listen.

Illusion of visual stability through active perceptual serial dependence.

Despite a noisy and ever-changing visual world, our perceptual experience seems remarkably stable over time. How does our visual system achieve this apparent stability? Here, we introduce a previously unknown visual illusion that shows direct evidence for an online mechanism continuously smoothing our percepts over time. As a result, a continuously seen physically changing object can be misperceived as unchanging. We find that online object appearance is captured by past visual experience up to 15 seconds ago. We propose that, because of an underlying active mechanism of serial dependence, the representation of the object is continuously merged over time, and the consequence is an illusory stability in which object appearance is biased toward the past. Our results provide a direct demonstration of the link between serial dependence in visual representations and perceived visual stability in everyday life

Manassi, M., & Whitney, D. (2022). Illusion of visual stability through active perceptual serial dependence. *Science Advances*, *8*(2), eabk2480.

Dealing with regression to the mean with post hoc trial/subject selection

Zoltan Dienes, *University of Sussex*

In implicit cognition research generally, a standard strategy is to measure the conscious status of knowledge on each trial (e.g. with confidence, structural knowledge attributions, visual clarity ratings) and then sub-select the trials where the knowledge is measured to be unconscious. If the accuracy is above chance that is taken to be evidence for unconscious knowledge. David Shanks has pointed out the problem of regression to the mean when people or trials are sub-selected: Because of the ubiquitous possibility of error in measurement, when a selection is made on the basis of one variable (e.g. conscious vs unconscious structural knowledge), the actual value of that variable will be closer to the mean than the measured value. Thus, trials selected to be based on unconscious structural knowledge will actually have some conscious structural knowledge. Does this critique undermine the use of trial by trial measurement, such as structural knowledge attributions in implicit learning (or confidence or PAS in subliminal perception)? I show that it does not. I show how to quantify the actual effect size that could be produced by regression to the mean in a given situation, how it may be so small as to be meaningless, and how to deal with it when it is of a moderate size, using Bayes factors with an interval null hypothesis.

Face masks and fake masks: The effect of real and superimposed masks on face matching with super-recognisers, typical observers, and algorithms

Kay Ritchie, *University of Lincoln*

Recent research has shown that face masks reduce face matching ability – that is the ability to tell whether two images show the same person or not. We tested humans (control participants and super-recognisers) and algorithms with images showing different types of face coverings, and found a consistent decrease in face matching accuracy with masked compared to unconcealed faces. We were particularly interested in comparing the effects of real masks (i.e. images of people wearing a face mask) and 'fake masks' (mask-like occlusions superimposed on to existing face images). We found that face matching performance was poorer for real compared to superimposed masks. We are in the process of testing algorithms with real and superimposed masks, and will include these results at the conference. Our results highlight the importance of testing both humans and computers with real face masks, as using only unconcealed masks may underestimate their detrimental effect on face identification.

Multisensory integration in ageing is associated with longitudinal fall number but not Timed-Up-and-Go trajectories.

Alan O'Dowd, *Trinity College Dublin, The Irish Longitudinal Study on Ageing*
Rebecca J Hirst, *Trinity College Dublin, The Irish Longitudinal Study on Ageing*
Annalisa Setti, *University College Cork, The Irish Longitudinal Study on Ageing*
Rose Anne Kenny, *The Irish Longitudinal Study on Ageing*
Fiona N Newell, *Trinity College Dublin*

Objectives: To examine whether the precision of multisensory integration is associated with longitudinal fall patterns and/or sensorimotor function in ageing.

Design: Data were drawn from The Irish Longitudinal Study on Ageing (TILDA). Over ten years, fall patterns and sensorimotor function were recorded. Multisensory integration was assessed once.

Methods: Older adults (N = 2,319) partook in the Sound Induced Flash Illusion (SIFI) involving three stimulus onset asynchronies (70 ms, 150 ms, 230 ms). Longitudinally, self-reported number of falls and performance on the Timed Up and Go task (TUG) were recorded. Longitudinal anchored K-medoids uncovered distinct trajectories for fall number (stable, increasing, decreasing) and, separately, sensorimotor fall risk (low, moderate, high). Using generalised mixed-effects regression models, we examined if these trajectory groups differed in the precision of temporal multisensory integration (based on response accuracy) across SOAs and age.

Results: Older adults with an increasing fall number trajectory showed a significantly different pattern of performance on the SIFI than non-fallers, depending on age: only the 'younger' fallers showed no difference in illusion susceptibility at 70 ms and 150 ms (i.e., more precise) while the 'oldest' fallers showed a much larger difference (i.e., less precise). There was no significant association between TUG trajectories and SIFI susceptibility.

Conclusions: Long-term patterns of falling uniquely modulate the effect of ageing on the precision of temporal multisensory integration. We consider the role of cognitive functions (e.g., inhibitory control) in this relationship. Our findings shed light on the mechanisms underpinning brain health in ageing and may have clinical relevance.

The effect of fair lineup modifications on child witness accuracy

Natalie Butcher, *Teesside University*
Kimberly Collins, *Teesside University*

Guidelines for constructing lineups state that the police should prevent suspects with distinctive features from standing out. In the US, England and Wales police use various techniques to replicate the distinctive feature across lineup members or conceal it via pixilation or a solid black rectangle. Research has investigated the effect of these fair lineup modifications on adult accuracy, but not child witnesses. This experiment investigates the effect of fair lineup facial modifications on accuracy and confidence during a lineup task involving child witnesses. Children (aged 5-16) view two mock crime videos. After each they are asked to rate their pre-identification confidence, attempt to identify the suspect from a 9-person lineup, and rate their post-identification confidence. We compare the three fair-lineup modifications used by the police with unfair lineups in which we do nothing to prevent distinctive suspects from standing out. Data will be analysed following the approach adopted by Colloff et al., (2016). The two outcome measures are willingness to identify the suspect, and ability to distinguish between culprits and innocent suspects. The former is measured using confidence ratings as a proxy for willingness. The latter is analysed using Receiver-Operating Characteristic (ROC) analysis to plot a probability of correct identification for each line-up type. The accuracy of line-up types is then compared by contrasting partial Area Under Curve values from the ROC analysis. The findings will advance knowledge on child witnesses' identification performance and have practical implications for how police construct lineups for use with child witnesses.

Ten-year cognitive trajectories of immediate recall, delayed recall and verbal fluency are associated with multisensory integration in ageing

Rebecca J Hirst, *Trinity College Dublin, The Irish Longitudinal Study on Ageing*
Annalisa Setti, *University College Cork, The Irish Longitudinal Study on Ageing*
Céline De Looze, *Trinity College Dublin, The Irish Longitudinal Study on Ageing,*
Rose Anne Kenny, *The Irish Longitudinal Study on Ageing*

Objectives: To examine whether multisensory integration precision predicts longitudinal change in cognitive function in a large cohort of older adults.

Design: 2875 participants, aged 50+, completed an immediate/delayed recall test and a verbal fluency task, at 2 year intervals over 10 years as part of The Irish Longitudinal Study on Ageing (TILDA). Within a larger healthcare assessment, participants also completed a novel measure of multisensory integration, at a single time-point.

Methods: K-means clustering was used to identify groups with distinct 10-year cognitive trajectories for measures of verbal fluency, immediate recall and delayed recall. We then used logistic mixed effect models to examine if these trajectory groups showed distinct patterns of multisensory integration. Multisensory integration was assessed using the Sound Induced Flash Illusion (SIFI), where participants were asked to judge the number of flashes they saw, whilst ignoring a congruent or incongruent number of beeps. Beeps and flashes were presented at several audio-visual temporal asynchronies, to observe the time-window in which audition influenced visual perception.

Results: More precise integration (i.e. less illusion susceptibility with larger temporal asynchronies) was associated with healthier cognitive performance trajectories across measures. These findings support broad links between multisensory integration and multiple cognitive measures, rather than an association with any specific subdomain. Furthermore these findings highlight a need to consider sensory function in a multimodal perspective, rather than studying the senses in isolation.

Relationships amongst older adults' cognitive and motor speech abilities: a systematic review

Laura Manderson, *University of Strathclyde*
Anna Krzeckzowska, *University of Strathclyde*
Anja Kuschmann, University of Strathclyde
Anja Lowit, University of Strathclyde
Louise Brown Nicholls, University of Strathclyde

Objectives: Previous research into ageing and speech typically focuses on relationships between cognition and language production. The present aim was to investigate relationships amongst older adults' cognitive and motor speech abilities including perceptual and acoustic features that reflect speech planning and/or execution.

Design: A systematic review was conducted to gather available evidence from healthy older adults and those with Mild Cognitive Impairment (MCI), aged 60+.

Methods: PsychInfo, PubMED, Web of Science, and the Cochrane Library were searched using terms related to cognition, motor speech and ageing. Thirty-two studies, published between 1987 and 2021, met all inclusion criteria. Data were extracted, and study quality was evaluated using the Mixed Methods Appraisal Tool (MMAT). Results were tabulated and presented via a narrative synthesis.

Results: Significant relationships were found between a range of cognitive abilities (e.g. global cognition, attention, speed of processing, working memory, long-term memory) and speech outcomes (perceptual, acoustic and kinematic measures) in healthy and mildly impaired older adults. Most notably, attention/executive functioning was significantly related to motor speech in 10 of 23 studies. However, only 10 studies overall contained high quality evidence.

Conclusions: Older adults' speech may be negatively affected under attention-demanding conditions. However, significant gaps in the literature and heterogeneity in measurements currently limits the ability to make general conclusions. Further research using a range of cognitive and speech tasks is therefore required. The same 'common cause' responsible for age-related declines to cognition and sensory/sensorimotor abilities may help explain motor speech changes.

The induction and measurement of mental fatigue in older adults: A systematic review of controlled trials.

Linda Renshaw, *University of Derby*
Callum J Osler, *University of Derby*

Mental fatigue is described as the feeling of lack of energy or tiredness which can be experienced after a day at work, or after shorter periods of sustained effort. The primary objectives of this systematic review were to evaluate the effectiveness of mental fatigue interventions in older adults and to inform future study design.

A systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRIMSA) guideline. Three electronic databases were searched: PubMed, Web of Science and Library Plus (provided by the University of Derby). Our criteria required studies to include participants with a minimum mean age of 65 years, involve a task designed to induce mental fatigue with a control task or condition, and report any measure of mental fatigue. All research was required to be published in a peer-reviewed journal, and no language exclusions were set.

We identified eight eligible studies and included one further study where the mean participant age of the older adults group was 62.82 years. The range of fatigue intervention task types, durations and outcome measures presented highlights the lack of consensus on how to effectively induce and measure mental fatigue in older adults.

This systematic review focused on mental fatigue in older adults, without a comparison between the way in which it might affect people of different age groups. Further research is required to identify efficacy of different fatigue induction tasks, and we would recommend that subjective, performance and physiological measures are captured for comparison.

Recognising faces across changes in age: A comparison of typical and superior face recognisers

Laura Sexton, *Open University*
Sarah Lawrence, *Open University*
Josh Davis, *University of Greenwich*

Objectives: Human faces change considerably in appearance over time. The current study aimed to a) examine whether super recognisers (SRs) show an enhanced ability to recognise faces across changes in age and b) explore whether a person's familiarity with a face affects how easily they can recognise it in age-separated images.

Design: A two-way independent measures design was used to examine the effect of group and familiarity on participants' ability to recognise faces across changes in age.

Methods: Data was collected using an old/new recognition task. In the learning phase, participants were shown images of contestants from UK Big Brother, series 1-3 (taken between 2000-2002). In the recognition phase, participants were tasked with identifying these same individuals from recent images (2019-2021). We compared the performance of individuals who watched Big Brother (familiar) and those who did not (unfamiliar). A third group of participants who watched Big Brother completed the recognition phase only.

Results: Results revealed a significant interaction between group and familiarity. SRs displayed higher accuracy than controls, but only in the two conditions in which they completed the learning phase. There was no difference between SRs and controls for the recognition task only. In addition, SRs who were unfamiliar with the faces performed at an equivalent level to the familiar control participants who completed the learning phase.

Conclusions: SRs in our research showed an enhanced ability to recognise faces across changes in age, but only when there was a short time delay between learning and test.

How do cognitive abilities predict children's language acquisition?

Ashley Blake, *University of Birmingham*
Ewa Dabrowska, *Friedrich Alexander University, Erlangen, Nuremburg*

Our study investigates the concept of children's language acquisition as a complex cognitive skill. We combine insights from the usage-based model of language acquisition and skill acquisition theory to investigate how different cognitive abilities predict linguistic outcomes in language typical children and children with language difficulties, such as developmental language disorder (DLD). 97 children (73 language typical children and 24 children with DLD), aged between 6;9 and 10;8 years took part in our online study. We used the Multiple-trial Tower of Hanoi task (MToH) as a measure of automatization, together with cognitive tasks measuring implicit learning, non-verbal intelligence, and working memory. These results were compared with performance on language tasks, including grammatical processing, vocabulary, sentence recall, and lexical and fluency measures derived from a narrative and spontaneous speech task. We found significant differences between the two groups in cognitive abilities and language measures, although implicit learning did not predict performance on linguistic tasks. Logistic regression showed that cognitive predictors of non-verbal intelligence, working memory and the coefficient of variation (as a measure of the speed of automatization) are strong predictors of language outcomes. Our results showed a higher coefficient of variation in children with DLD, indicating slower automatization on the MToH task and potential difficulties with proceduralization.

Politeness and the communication of uncertainty when breaking bad news

Harry Clelland, *Northumbria University*

Information is threatening to a person's 'face' when it damages their social identity. Uncertain language can be used to express genuine uncertainty but can also be used to manage face (e.g., by softening bad news). These conflicting motivations can create ambiguity in health communication, where clarity must be balanced with tact. We aimed to extend the current evidence to formal social interactions with higher stakes (e.g., a doctor breaking bad news to a patient). In this two-part experiment, participants assumed the position of a health specialist and wrote a letter communicating either a certain or an uncertain medical diagnosis. This letter was addressed either to the patient (high face-threat) or to the patient's family doctor (low face-threat). We found that letters written under high face-threat had a higher word count and contained more dispreferred markers (e.g., words like 'sorry' and 'unfortunately') than those written under low face-threat. The number of explicit hedges (e.g., words like 'possibly', 'maybe' and 'could') did not differ between conditions. The use of face management strategies did not affect how the letters were comprehended by a separate set of participants, with letters written under high and low face-threat perceived as equally certain, equally direct and equally polite. Our data demonstrate that participants spontaneously produced dispreferred markers (but not explicit hedges) to manage face through indirectness. These findings align with previous research and Politeness Theory as a whole. However, this subtle face management strategy did not affect how the language of the message was processed.

Predictors of phonemic fluency ability in adults with dyslexia

James Smith-Spark, *London South Bank University*

Objectives: Phonemic fluency requires the controlled access of information in long-term memory in order to verbally generate as many items beginning with a certain letter as possible within a certain time limit. Dyslexia-related deficits in this aspect of executive function are well documented. However, recent research has suggested that these problems may be explained by dyslexia-related impairments in executive processes rather than by phonological processing problems alone. To explore this proposition, data were combined from two previously published papers to determine whether the phonemic fluency of adults with dyslexia could be best explained by vocabulary size, reading and spelling measures or verbal working memory span.

Methods: The scores of 28 adults with dyslexia on measures of vocabulary, reading and spelling, and verbal working memory span were analysed using hierarchical regression, controlling for differences in short-form IQ.

Results: Verbal working memory span was a positive predictor of the number of items produced, as well as both switching and the number of items generated correctly in the first two 15s quartiles of performance (all standardized-$\beta \geq .387$, all $p \leq .05$). Vocabulary size, spelling score, and reading score did not predict any aspect of performance.

Conclusions: A role for verbal working memory span in predicting phonemic fluency performance is consistent with previous research. However, this role has not previously been explored in dyslexia. The findings suggest that at least some of the dyslexia-related phonemic fluency problems can be explained by executive processes and this contribution needs to be explained by dyslexia theory.

Executive functions, not bilingualism or culture predict visual perspective taking in adults

Yifan Wang, *School of Psychology, University of Birmingham*
Andrea Krott, *School of Psychology, University of Birmingham*
Ian Apperly, *School of Psychology, University of Birmingham*

It has been found that bilingual speakers outperform monolingual speakers in tasks which involve taking others' perspectives. However, factors that drive this advantage have remained unclear. Potential factors include executive function (EF) and cultural orientation. This study aimed to confirm that bilingualism leads to better performance in visual perspective taking tasks and whether culture (orientation and acculturation) and EF can predict perspective-taking performance among bilingual and monolingual young adults.

63 Chinese and 61 European bilingual adults, as well as 60 native British monolingual adults conducted level-1 and level-2 perspective taking and EF tasks (flanker and color-shape). They also filled in cultural orientation, acculturation (VIA), and bilingualism (LSBQ) questionnaires.

Contrary to previous studies, we did not find a bilingual advantage in perspective interference suppression, neither on the level-1 or level-2 perspective taking task. However, Chinese bilinguals showed some superior performance in perspective taking over the other two groups as well as a smaller interference effect in the flanker task. We also found a general correlation between EF (inhibition and switching) ability and perspective taking tasks. Cultural orientation or acculturation scores were not related to perspective taking performance.

The results suggest that individual differences in EF skills but not bilingualism or culture predict visual perspective taking performance in young adults.

A new take on bounded rationality

Emmanuel Pothos, *City, University of London*
Stephan Lewandowsky, *Bristol University*

Objectives: It has been extensively recognized that the normative and adaptive advantages of Bayesian inference need to balanced against the intractability of such inference (in baseline form). Several proposals have been offered to mitigate this fundamental problem, including sampling approximations, Bayesian Networks, and cost/ complexity terms. This long-standing debate also relates to the influential approach to understand inference with heuristics and biases and dual systems. Our focus is attempts to resolve this problem through proposals that human inference is 'locally' Bayesian. We offer a particular conceptualisation of what 'local' means, employing quantum theory, that is, the rules for how to assign probabilities to events from quantum mechanics, without the physics. The main question we address in this work is how we can compare the information requirements of quantum vs. Bayesian inference.

Design: We outline an information-theoretic framework for offering a principled comparison between baseline Bayesian theory, Bayesian theory simplified with Bayesian Networks, and quantum theory.

Results: We show that under reasonable assumptions, in general, quantum theory is less informationally intensive, compared to the two Bayesian alternatives we explored.

Conclusions: This demonstration provides promising evidence as to why it appears that, sometimes, quantum cognitive models work well. The strength of the present work needs to be moderated by the limited range of compared frameworks, e.g., the complexity of sampling approaches cannot be easily quantified with the present methods. Finally, we illustrate how quantum probabilities can offer simplification, relative to Bayesian ones, depending on environment structure.

Numerators versus denominators: How do they influence judgments of risk?

Susan Cooper, *Kingston University*
Frederic Vallee-Tourangeau, *Kingston University*

Objectives. The purpose of this study was to investigate how different representations of the same risk information influence the perceived likelihood of an event. In particular, for objectively equivalent risks, we examined the effects of the magnitude of the numbers used in a risk ratio (e.g., 1-in-5 vs. 12-in-60), and the salience of its numerator and denominator, on subjective judgments of likelihood. Numeracy was also measured to determine any moderation effect. Design. A 3(information format: numerator, denominator, or both made salient) by 3(ratio magnitude) mixed design was used. Methods. Participants from the general adult population (N = 182) were recruited via Prolific and completed an online Qualtrics survey. Participants were randomly allocated to one of the three format conditions and rated the likelihood of experiencing a negative outcome in three health-threat scenarios which incorporated objectively equivalent risk ratios but presented with varying number magnitudes. Participants also completed a numeracy scale. Results. There was a large and significant interaction effect ($\eta p2$ = .229, 90% CI [.157, .287]). Ratios presented using larger numbers yielded lower likelihood judgments when the denominator was made salient but higher judgments when the numerator was salient. When both were made explicit, the pattern resembled that observed when the denominator was salient. Participants with high numeracy were equally sensitive to the bias. Conclusions. These findings suggest that the perceived relative importance of each ratio component, as well as its magnitude, plays a role in risk perception. There are implications for accurate and effective risk communication.

Examining the effects of construal on financial decision-making using fNIRS

Christopher Wilson, *Teesside University*

Background: Construal level – described simply as thinking about how (low construal) or why (high construal) something needs to be done – has been shown to affect decision-making making. In the context of financial decisions, it has primarily been examined in the context of delayed gratification or long-term plans. However, there is evidence that construal interacts with cognitive load and can have a more influence on risk-related decisions. In addition, there is a death of work examining neurological correlates of construal in this context.

Objectives: to examine how low and high construal affect risk-taking in financial decisions and identify neurological indicators of construal.

Design: 2 experimental studies were conducted. In both, tasks were presented to increase cognitive load. Then, construal-related cues were presented prior to each trial in coin-toss gambling task. In experiment 2, fNIRs was used to measure frontal lobe activation during decision-making.

Results: Using mixed-effects logistic regression, Experiment 1 showed that high-construal predicted significantly lower probability of gambling. Experiment 2 data are being analysed at the time of submission.

Conclusion: The results of Experiment 1 show the impact of construal on immediate risk-related financial decisions. Experiment 2 will provide more information on how construal impacts the decision-making process.

Never going back again (to the lab). The (nearly) one-thousand participant study of firefighter cognitive biases using web-based simulation.

Graham Edgar, *University of Gloucestershire*
Catherwood, D., Baker, S., Brookes, D., Naughtie, C., Sallis, G., Silcock, G., Walker, S., Frampton, Y., *University of Gloucestershire (UK)*
Polikarpus, S., Taukar, M., Kütt, T. Estonian Academy of Security Services (Estonia)
Fikke, R.C., Geertsema, T., Hazebroek, J.C., Tonnaer, C., Weewer, R., *IFV Institute for Safety (Netherlands)*
Figueras Masip, A., Fuste Castella, R., *Institute for Public Security of Catalonia (Firefighters and Civil Protection School) (Spain)*
Thoelen, F., Vastmans, J., *PLOT (Provincial Centre for Education & Training) (Fire School) (Belgium)*
Blom Andersen, N., Bøhm, M.,Holm*, L.O.C.N. University College Copenhagen (Department of Technology, Emergency And Risk Management) (Denmark*)
Arendtsen, B., *East Jutland Fire Service (Denmark)*

Objectives: To develop a web-based platform for testing and training situation awareness (SA) and situation understanding (SU) in firefighters.

Design: A web-based platform (Labvanced) allowed us to collect data from a much larger sample than would be feasible using laboratory-based methods. We collected data from 974 firefighters and non-firefighters across four countries (Denmark, Estonia, the Netherlands, and Spain). We developed an online scenario to assess firefighter cognitive biases (acceptance of information as true, or relevant) in a simulated road-traffic collision (RTC). Using a desktop virtual reality simulation, we examined firefighters' awareness of the situation (SA), – and their understanding of what aspects of that situation were relevant to the successful completion of their task (situation understanding, SU).

Results: Firefighters showed individual differences in the amount of information they accepted as true when building SA, but were almost universally predisposed to believe that information was relevant to their task (even though it may not have been). We also found that participants' confidence in their performance may not match their actual awareness or understanding. That is, participants perceived and actual awareness/understanding of the situation often did not match. Comparing different countries, we found differences in firefighters' acceptance of information as true within, or relevant to, the situation.

Conclusions: A web-based platform provided an effective method of assessing performance in a large sample of firefighters and non-firefighters, revealing differences between individuals and countries. The approach is being developed for use in firefighter training (the platform provided integrated feedback on performance).

Successful everyday decision making: Combining analytic and associative cognition

Adrian Banks, *University of Surrey*
David Gamblin, *Birkbeck, University of London*

Objectives: How do people make everyday decisions in order to achieve the most successful outcome? A rational, analytic approach is typically prescribed as the optimal strategy. However, this research rarely investigates whether the outcome is successful for the decision maker. In contrast, approaches using associative knowledge have been linked to biases, but they may be adaptive for everyday decisions that are grounded in personal experience.

Design: In two studies, longitudinal, within-subjects designs were used to elicit analytic and associative knowledge about the decision. The success of the decisions was evaluated after the outcome was known.

Method: Participants (n=297) reported a personally meaningful decision that they were currently facing. They reported and rated the attributes of the decision, and associative knowledge about the decision was elicited through free association and rated. One week after the decision was made participants evaluated the decision outcome. Participants also completed the Cognitive Reflection Test and the Berlin Numeracy Test.

Results: 1) a rational decision analysis of everyday decisions is not superior to simpler analytic processes in predicting decision outcomes; 2) free association generates valid cues that predict choice and decision outcomes as effectively as analytic approaches; 3) combining both analytic and associative rules best explains everyday decisions and most accurately predicts decision outcomes; 4) a tendency to engage in analytic thinking was not associated with more successful everyday decisions.

Conclusion: We propose a dual process theory in which analytic and associative cognition is integrated to both explain everyday decision making and predict successful decision outcomes.

The effect of voice sample duration and lineup size on voice identification performance

Nikolas Pautz, *Nottingham Trent University*
Harriet Smith, *Nottingham Trent University*
Kirsty McDougall, *University of Cambridge*
Katrin Mueller-Johnson, *Oxford University*
Francis Nolan, *University of Cambridge*

Objectives: Home Office guidelines (2003) recommend that voice parades should have nine voices, each played for 60 seconds. In two experiments, we investigated if it is feasible to reduce the duration of the voice samples and the number of foils in a parade without adversely affecting identification performance. Hypothesis 1: listener performance will not differ meaningfully between 15s, 30s, and 60s sample durations in a 9-voice parade. Hypothesis 2: patterns of performance in a 6-voice parade will be similar to those derived from a 9-voice parade.

Design: Both experiments utilised a 2 (target presence: absent, present) by 3 (sample duration: 15s, 30s, 60s) between-group design.

Methods: We recruited N=271 and N=270 participants for the respective experiments via Prolific. Participants were randomly assigned to one of six parade groups which were comprised of voice samples taken from forensically-orientated databases with three different accent groups (SSBE, Western Yorkshire, York). Participants were randomised to either a target-present or -absent parade. The experiments were hosted on Gorilla. Data were primarily analysed using non-linear Bayesian Signal Detection Theory models.

Results: Taken together, the results show that regardless of parade size, signal sensitivity is above-chance when using the 15s and 60s voice samples but is at chance level for the 30s duration. Response criteria were largely liberal across the conditions.

Conclusions: The results provide initial evidence that the sample duration used in a voice parade may be reduced without harming performance. We argue parades with nine-voices should be maintained to provide additional protection for a potentially innocent suspect.

How quickly do we learn faces in everyday life? Event-related brain potentials reveal robust face identity learning after a brief real-life encounter.

Tsvetomila Popova, *Durham University*
Holger Wiese, *Durham University*

Objectives: The present series of experiments used event-related brain potentials (ERPs) and the N250 familiarity effect as an index of visual familiarity to investigate the time it takes to learn a face in everyday life.

Design and Methods: Participants interacted with a pre-experimentally unfamiliar person for 30 minutes (Experiment 1, n = 24), 10 minutes (Experiment 2, n = 34), or 5 minutes (Experiment 3, n = 34), and were then presented with multiple highly variable images of the newly learnt identity and an unfamiliar face. A final control experiment with no learning phase (Experiment 4, n = 34) was conducted in which both identities were unfamiliar. Mean ERP amplitudes from 200-400 ms were analysed at electrodes TP9 and TP10.

Results: Significant N250 familiarity effects were observed after a 30-minute and a 10-minute social encounter, and a trend was present after five minutes of learning. No difference between conditions was observed in the control experiment confirming that the observed effects indeed resulted from the social interaction before testing.

Conclusions: In everyday life, we learn faces very quickly as 5-10 minutes of exposure were sufficient for the initial establishment of image-independent representations. Additionally, the magnitude of the effects observed after 10 and 30 minutes was comparable suggesting that the face variability experienced throughout the first 10 minutes of a social encounter might be crucial, with extra 20 minutes from the same first encounter with the person not adding further benefit for the initial formation of robust face representations.

Wisdom of the crowd effects in face matching

Peter Hancock, *University of Stirling*
Daniel Carragher, *University of Adelaide*

The 'Wisdom of the Crowd' effect is not surprising, statistically. If you have a number of independent participants in some task, and they each individually do better than chance, then an average of their decisions will, on average, do better than the average of their individual scores. For a given task, such as face matching, a crucial question, therefore, is the independence; if everyone makes the same mistakes, then no amount of averaging will help. However, individuals do vary in their errors, for a variety of reasons. Crowd effects therefore do occur for face matching tasks (White et al. 2013). Through a mixture of simulation and analysis of existing data, I explore some of the issues around crowd effects for face matching, such as, how big a crowd do you need to get a reliable improvement? For one of our datasets, the answer turns out to be 9, for another, 18. In particular, what is the best way to combine confidence information? Does it help to transform the response scale, giving more (or less) weight to confident answers? It turns out that in some of our data, there is no useful information at all in the 'guess yes'/'guess no' distinction.

White, D., Burton, A. M., Kemp, R. I., & Jenkins, R. (2013). Crowd Effects in Unfamiliar Face Matching. Applied Cognitive Psychology, 27(6), 769–777.

Testing the face recognition abilities of international police applying for super-recognition roles

Josh Davis, *University of Greenwich*

There are very large individual differences in face recognition ability in the population. Super-recognisers, with exceptionally good unfamiliar face recognition skills occupy the top end of the spectrum. Partly a consequence of the successes of London police super-recognisers at identifying suspects from CCTV, a growing number of international police forces are deploying super-recognisers to jobs in which facial identity processing is a key component. The current research describes the procedures used to test the face recognition abilities of police officers (n > 20,000) applying for roles as a super-recogniser from more than 20 international police forces. Applicants aimed to complete at least 10 tests, measuring short-term face memory, long-term face memory, simultaneous face matching and spotting faces in a crowd. Apart from a final three-hour invigilated examination session for a selected group of the highest scorers, most tests were taken online. Initial hypotheses were supported in that scores by a sub-set of the police on identity processing tests commonly used by academic researchers in this field, significantly but weakly predicted the likelihood of officers being short-listed or not for the role of super-recogniser. As with previous research, between-test heterogenous patterns in the data were found. However, only a few participants achieved consistently good scores on all tests, a proportion smaller than the "super-recognisers comprise 2% of the population" figure often reported in the media or in research papers. These results have theoretical implications when defining criteria for super-recognisers in research, as well as practical recruitment policy implications.

The impact of forensic delay: facilitating facial composite construction using an early-recall retrieval technique

Charlie Frowd, *University of Central Lancashire*

Research suggests that memory for facial features declines over time (Ellis et al., 1980). A consequence of this effect is that increasing retention interval reduces accurate construction of facial composites (Frowd et al., 2015). In Experiment 1, participants recalled an unfamiliar face using cognitive-interviewing techniques and constructed a composite of it with a modern feature system immediately, or after 3-4 hours, 2 days or 1 week. Accuracy of naming of these composites decreased rapidly after 3-4 hours, remained largely constant for two days, and reached floor-level performance after 1 week. In Experiments 2–4, we attempted to overcome decline in memory performance using a practical retrieval procedure whereby participants were instructed to write down a detailed description of the previously-presented face. Participants either undertook this early-recall procedure 3-4 hours after encoding, or did not, and constructed a composite the following day using a modern feature system, forensic sketch or a holistic system. For all three systems, participants created more accurate composites following early recall. An advantage was also observed for a character-based interviewing technique for feature and holistic systems. Results highlight the advantage of face recall during the interval between face encoding and construction, and for combining interviewing techniques.

Predictors of incidental and intentional learning: Curiosity, construal level, and musical arousal

Firuze Ebrar Mullaoglu, *Ruhr University Bochum*
Nursena Armağan, *Albert Ludwigs Freiburg University*
Gülten Ünal, *Ankara Yıldırım Beyazıt University*

Having an intention (or not) forms a categorisation system for learning. Correspondingly, incidental learning stands for learning without intention to learn. In light of this, the current paper examines the possible influences of incidental and intentional learning. 170 adults participated in three experimental studies. In each experiment, participants examined some animal illustrations and read paragraphs about them. To assess intentional learning, participants answered some questions according to the presented paragraph. For incidental learning, participants responded to questions about the animal illustrations (e.g., the colour of the illustrations). In the first study, animal illustrations were arranged as being common (i.e., low curiosity) or novel to examine the effect of curiosity. Low curiosity level was more effective for incidental learning and vice versa for intentional learning. In the second study, mental time travel manipulation showed focusing on the current time increased intentional learning. However, it did not affect incidental learning. In the third study, the effect of arousal was examined via the tempo of the music (i.e., faster tempo for high arousal level). Low arousal level increased incidental learning; however, it was not the case for intentional learning. Ultimately, curiosity, mental time travel, and arousal could be essential in intentional and incidental learning.

A pilot semantic strategy training intervention aimed at enhancing visual working memory capacity.

Louise Brown Nicholls, *University of Strathclyde*
Rebecca Hart, *University of Strathclyde*

Objectives: More meaningful, 'high semantic' visual working memory tasks are more likely than low semantic tasks to activate non-visual codes, boosting participants' available resources and capacity. Actively combining strategies is also positively associated with performance, and is most effective during more demanding, low semantic tasks. Our pre-registered hypothesis was that semantic strategy instructions would boost visual working memory, specifically in a low semantic task in which semantic codes are less automatically activated.

Design: An experimental design was used to assess effects of semantic availability in task stimuli (low, high; within participants), and semantic instructions (control, instructions; between participants) on visual working memory recognition.

Methods: There were 44 young adults (aged 18-35 years) whose performance of the modified Visual Patterns Test (low and high semantic tasks) was assessed remotely, using EPrime 3.0. Task administration order was fully counterbalanced. Participants were also asked to self-report the extent to which they used various strategies (e.g. visual rehearsal, verbal recoding, using semantics).

Results: The expected effects of semantic availability, semantic training, and the interaction were not significant. This may be associated with the use of a recognition paradigm, rather than recall. Promisingly, however, the intervention group's accuracy was positively correlated with reported use of semantics, specifically within the low semantic task, suggesting a role for individual differences in ability or willingness to implement the semantic strategy.

Conclusions: The intervention warrants further investigation, particularly using recall to measure performance. It may also be more effective in specific populations with lower capacity, such as older adults.

Feasibility of unconscious instrumental conditioning: A registered replication

Ryan Scott, *University of Sussex*
Lina Skora, *Heinrich Heine Universität*
James Livermore, *Radboud University*
Zoltan Dienes, *University of Sussex*
Anil Seth, *University of Sussex*

Objective: To establish if instrumental conditioning occurs without stimuli awareness by, (1) a direct replication of a seminal study by Pessiglione et al. (2008), and (2) a conceptual replication with improved methodological rigour.

Design: Exp1 precisely replicated the original study. Perceptual discrimination tasks (PDTs) before and after the main conditioning task sought to establish subliminal thresholds; these required same/different judgments after sequential presentation of two masked stimuli. The main conditioning task required Go/No-Go decisions after single presentation of masked stimuli predicting reward, punishment, or neutral outcome. Exp2 used a modified PDT to better match the decision process in the conditioning task and added trial-by-trial tests of awareness during conditioning to capture any momentary instances of awareness.

Methods: Participants were University of Sussex students compensated with course credits plus performance-related cash payments. Sample sizes (NExp1=56; NExp2=45) were determined by Bayesian stopping rules. Stimuli were characters from Agathodaimon font, presented on a 60Hz monitor. Type-1 d' was computed for the PDT to assess awareness, and the conditioning task to assess learning. Results were subjected to one-sample t-tests against zero with Bayes factors assessing sensitivity.

Results: Exp1 found significant learning (d'=0.37, SE=0.11, t(39)=3.24, p<0.001, BH(0, 0.7)=93.65), but insensitive evidence for absence of awareness (d'=0.05, SE=0.03, t(39)=1.55, p=0.064; BH(0,0.33)=0.57). Exp2, with trial-by-trial exclusion of aware trials, found a reliable absence of learning (M=0.03, SE=0.04, t(40)=0.77, p=0.447, BH(0,0.7)=0.11).

Conclusions: The results provide robust evidence that instrumental conditioning cannot be achieved without stimulus awareness, supporting emerging evidence that complex forms of learning rely on conscious access.

Does the Animacy Effect apply to location memory?

Dan Clark, *Liverpool Hope University*

Objectives: Recent research has shown evidence that animals are better remembered than inanimate objects – a contrast that is referred to as the Animacy Effect. Whilst the Animacy Effect has been shown in a number of modalities, there is currently limited research that explores whether the effect applies to location memory. The current study predicted that animate stimuli locations would be better recalled than that of inanimate stimuli.

Design: Two studies explore the Animacy Effect by asking participants to rate both animate and inanimate stimuli with regards to either their ease to collect to win a scavenger hunt (Exp.1) or their distance from the middle of the computer screen (Exp. 2). Following completion of the encoding task, participants completed a short distracter task and were then asked to complete a surprise recall task, recalling the location of the targets via mouse click in the recalled location.

Results: The results of both experiments demonstrated that the inanimate target locations were recalled more accurately than the animate targets.

Conclusion: Two experiments revealed, counter to predictions drawn from the literature, a reverse Animacy Effect for location, where inanimate target locations were better recalled than animate targets. The replication of the effect in Exp. 2, using a different encoding cover task, suggests that this is not simply the result of the encoding task employed. Future work should explore why there is a reverse animacy effect for the recall of target locations.

Visual aesthetic appeal influences visual search

Irene Reppa, *Swansea University*

Background & Objectives: Attractiveness of objects, people, or interfaces is key to much of our everyday life decisions and behaviours, with significant socio-economic impact. But do attractive objects attract attention to themselves? This series of experiments examined whether aesthetic appeal, can act as an object attribute that guides visual search. If appeal enhances the salience of the targets pre-attentively, then appealing icons would lead to more efficient searches than unappealing targets and, conversely, appeal of distractors would reduce search efficiency.

Design: Three lab-based experiments (N=112) employing a repeated-measures design examined how aesthetic appeal influences performance in a classic visual search task. In each experiment, participants completed 320 visual search trials, with icons varying in rated aesthetic appeal and either visual complexity (Experiments 1 and 2) of concreteness (Experiment 3) among 2, 4, 8, or 11 distractor icons.

Results: Three key findings confirmed that visual search is not blind to beauty. First, search efficiency was determined by visual complexity, with icons rated as visually simple guiding search more efficiently than those rated as visually complex. Second, search times for appealing targets were faster than for unappealing targets, across all three experiments. Third, when distractors were appealing, they took longer to be rejected, and the search advantage for appealing targets was reduced.

Conclusions: Even though there was no evidence that appeal influenced search efficiency, it led to efficient visual search, even when task irrelevant. Future work should examine the mechanism with which appeal can influence performance.

The role of cognitive control in explaining the relationship between hallucinatory experiences and sleep health

Georgia Punton, *Northumbria University*

Objectives: Bi-directional associations exist between sleep health and hallucinatory experiences. It has been hypothesised that disrupted sleep may exacerbate deficits in cognitive control that appear to underpin hallucinations. This study aimed to investigate whether cognitive control mechanisms (i.e., intentional inhibition, the ability to suppress intrusive cognitions, working memory capacity) and poor sleep health could predict hallucinatory experiences within the general population.

Design: A cross-sectional, correlational design was employed online, with participants recruited mainly through Prolific.

Methods: Participants (N=211) completed self-report measures of sleep health, hallucinatory experiences, and suppression of intrusive cognitions. Additionally, they completed the Inhibition of Currently Irrelevant Memories task to measure intentional inhibition, and a Backwards Digit Span task for working memory capacity.

Results: Findings indicated significant associations between hallucinatory experiences, poor sleep health, and the ability to suppress intrusive cognitions. Poor sleep health was a significant predictor of hallucinatory experiences in an initial regression model, but this effect was no longer significant once the ability to suppress intrusive cognitions was added to the model. Intentional inhibition and working memory capacity were unrelated to frequency of hallucinatory experiences.

Conclusions: Results support previous findings concerning links between poor sleep health, hallucinatory experiences, and some aspects of cognitive control. Ability to suppress intrusive cognitions may mediate the association between hallucinatory experiences and sleep health; this will be tested in our forthcoming replication attempt. Considering the online design, findings are consistent with previous lab-based studies our research group has conducted, suggesting online data collection can be effective and high-quality.

Effects of visual perspective on decision making

Firuze Ebrar Mullaoglu, *Ruhr University Bochum*
Gülten Ünal, *Ankara Yıldırım Beyazıt University*

Changes in visual perspectives alter individuals' product selection and mental construal. Hence, there might be a further link between visual perspective and decision-making process, affecting perception and personal needs. The current study aims to reveal the perceptual differences in individuals' visual perspectives. For this purpose, two experimental studies were conducted. In the first study, narrow (or wide) perspectives of three objects were presented to the participants. Then, for each object, the participants were asked about their perceptions of these objects, such as "how big and heavy the object is" and their attitude towards these objects (whether the participant would like to buy, use, or give this object as a gift). In the second study, the participants were presented with wide (or narrow) angle weather pictures. Afterwards, the participants were asked about their perceptions of this weather (temperature, cloudiness rate, possibility of rain, and possibility of getting cold) and their possible needs (how much they will need objects such as umbrella, fan, and radiator). The first study's results indicated a significant change in the perception of only the first object (bowl). Also, the participants in the narrow-perspective group interpreted the bowl as bigger and heavier. Participants' attitudes towards the object were statistically significant for both the second and the third object. The results for the second study implied that the participants in the widen-perspective group thought they would need more objects. In the light of these findings, there might be an effect of visual perspective on perception and the decision-making process.

Expectation-based blindness: Predictions about object categories gate awareness of focally attended objects in dynamic displays

Alon Zivony, *Birkbeck College, University of London*
Martin Eimer, *Birkbeck College, University of London*

In "inattentional blindness", attention is assumed to be the necessary factor in gating access to conscious awareness, while expectations are only thought to affect the allocation of attention. In four experiments (N=763), we challenged this assumption and examined the unique role of expectations in the detection of attended objects. We present evidence for a new phenomenon we term "expectation-based blindness" (EBB). Participants were presented with rapid serial visual presentation streams and had to identify an alphanumeric character (letter or digit) indicated by a cue. The target category repeated for 19 trials and then unexpectedly switched from the 20th trial onward. Accuracy was reduced on the surprise trial when the category switched and returned to baseline on the following trial. In Experiments 2-4, no drop in accuracy was observed when the target changed from one subset of possible targets to another subset from the same category, ruling out novelty as the critical factor for EBB. In Experiment 3, this pattern emerged even when the pre-cue appeared prior to the target, indicating that EBB cannot be attributed to changes in attentional guidance. Experiment 4 demonstrated that EBB is also elicited for real-world photographs of visual objects (human and animal faces). These findings show that the awareness of visual objects is gated by predictions. When expectations about object categories are wrong, observers may fail to notice objects even though they are attended. EBB may be linked to activation of long-term memory representations, resulting in encoding benefits for expected and costs for unexpected objects.

Moral intuitions regarding the use of artificial intelligence

Yuxin Liu, *The University of Edinburgh*
Adam Moore, *The University of Edinburgh*

Objectives: To investigate whether judgements about AI stem from general AI attitudes or are motivated by underlying politico-moral intuitions in AI deployment contexts. We predicted increased willingness to act on AI verdicts, increased trust in and perceived fairness of the AI as a function of politico-moral belief compatibility, over and above any general AI attitudes, with conservatives showing stronger belief alignment effects.

Design: In two experiments (within-subject/E1 and between-subject/E2), participants read conservative/liberal-framed vignettes, where an AI system flagged statistical anomalies of a human agent's potential prejudice. If people have no strong existing intuitions towards AI systems, then context-elicited politico-moral intuition compatibility should predict their judgements of AI verdicts.

Methods: 202 (E1) and 302 (E2) subjects recruited on Prolific Academic completed political orientation measures, General Attitudes towards AI Scale, and responded to scenarios on Qualtrics, differing only in the number of scenarios received between E1/E2. We conducted Bayesian multivariable multilevel regression on willingness to act, trust, and fairness perception predicted by political orientation, context, and their interaction.

Results: Scenario framing/context and political orientation consistently predicted willingness to act, but not judgements of trust or fairness perception of the AI. Belief alignment effect for willingness to act was stronger for liberals, contrary to predictions. General AI attitudes had no consistent influence on any outcome variables.

Conclusions: While participants may have weak intuitions towards AI generally, they seem to construct them spontaneously based on compatibility between AI verdicts and their pre-existing politico-moral beliefs, suggesting the malleability of AI perception and importance of framing.

Susceptibility to phishing: How persuasive techniques and email context can form decision-making profiles

George Raywood-Burke, *Cardiff University*
Phillip Morgan, *Cardiff University*
David Greeno, *Cardiff University*
Dylan Jones, *Cardiff University*

Phishing emails continue to be a cyber threat to home and work users alike, with types of phishing used by cyber attackers being regularly adapted. Many contain persuasive techniques which may increase the likelihood of responding– e.g., information coming from a source of authority, or instil a sense of urgency and need to respond immediately. Whilst research into the success of persuasive techniques has explored the likelihood of responding to phishing emails, little is known about how differing email contexts may alter the success of risky decisions being made. Through developing a behavioural tool based upon Expected Utility Theory, we are investigating how persuasive techniques may have differing success rates in phishing for different email contexts. We predict participants are more likely to respond to emails which contain an authority or urgency persuasive technique, and are less likely respond to emails which are judged to have a high probability of being phishing. We expect participants to be more likely to judge emails as phishing when the perceived negative consequences of responding are high. By investigating subjective values of email outcomes, estimations of phishing probability, and decision choices, we can highlight which types of emails people are the most susceptible to phishing attacks. Data collected will be used to inform cyber-security training by bringing individual strengths and vulnerabilities to the foreground for intervention.

Risk aversion not loss aversion is influenced by fear, sadness and anger

Stephan Treiss, *City, University of London*
Lee C. White, *City, University of London*
Philip Corr, C*ity, University of London*
Emmanuel Pothos, *City, University of London*

Objective: The objective of this research is to analyse the effects of incidental emotions on loss aversion (LA) and/or risk aversion (RA).

Experimental design:
1. Emotion induction with writing task (4mins), each participant is allocated to one emotional category (either anger, sadness, happiness, fear or neutrality)
2. Decision-making task containing 64 gain-loss gambles intended to measure loss aversion and 30 gain-only gambles intended to measure risk aversion (presented in three blocks in a random order)
3. Measurement of the emotional induction via a PANAS-X questionnaire intended to measure the specific emotions anger, sadness, happiness, fear
4. Various personality questionnaires; specifically, BIS/BAS questionnaires, and STAI

Rationale:
• Usage of the currently dominant approach to measure loss and risk aversion based on Tom et al. (2007)
• Control for personality variables + anxiety
• Between-participant because of length of task (average: 23mins)

Results (n=84):
• LA does not correlate with any of the emotion variables
• RA does significantly correlate with sadness (-), fear (+), anger (+)
DV: RA
IV: Sadness, fear, anger, control variables (age, gender, BIS, BAS-Fun, BAS-Reward, BAS-Drive, STAI, Gender*sadness, BAS-Drive*sadness, BAS-Drive*fear, STAI*fear).
$F(11,72)=2.64$, $p=.007$.

Conclusions:
• RA not LA significantly correlates with anger, sadness, and fear
• Gender and BAS-Drive moderate the relation between RA and the emotion categories
• LA and RA measurement method needs to be controversially discussed

Limitations:
• Within study design may make it difficult to compare RA and LA
• LA and RA measurement may need to be improved (Walasek & Stewart, 2021)

Minimal mindfulness of the world as an active control for a full mindfulness of mental states intervention

Max Lovell, *University of Sussex*
Zoltan Dienes, *University of Sussex*

Objectives

Mindfulness is a metacognitive exercise in the monitoring and control of the extent to which one is on-task. In Buddhism, mindfulness is mainly directed towards mental states themselves. Alternatively, mindfulness could be directed towards the world around oneself, thereby being less metacognitive. Notably, whilst mindfulness of the world is directed towards the referents of sensory states, mindfulness of mental states includes a higher-order awareness of the experience of a sensory state. Using this distinction we will construct contrasting interventions to test the centrality of metacognition in mindfulness.

Design

A minimal Mindfulness of the World intervention will be pitted against a full Mindfulness of Mental States intervention (10 days each, prerecorded). The former may be interpreted as an active control. There was also a waitlist control.

Methods

Metacognitive ability is measured via meta-d' – visually in our first study (with stage-1 RR acceptance), whilst our second extends the breath counting measure into the metacognitive domain with confidence ratings. We also use a bespoke survey measure of first- and second-order mindfulness of the world, alongside surveys targeting decentring and mental health. All materials are automatically delivered online. Informed Bayesian contrasts of the group*time interaction will be used, with a Bayesian stopping rule.

Results

A pilot study found evidence in the hypothesised direction (B>3) on the Observe and Acting with Awareness facets of the FFMQ-sf, the PHQ-4 anxiety subscale, and the RRS. Preliminary data for the breath study is largely insensitive.

Feel positive, test negative: examining the applicability of the light quartet in relation to doping attitudes and behaviours among athletes

Mark Thompson, *London Metropolitan University*

Objectives: Engaging in doping usage can be characterised as a maladaptive coping behaviour which may be influenced by a number of psychological drivers. However, despite significant interest from scholars and investment from national and international sporting organisations, anti-doping interventions have seldom been effective. Such interventions have typically relied heavily upon traditional appeals to fear, with limited integration of positive psychological traits. Fortunately, it has been suggested that positive psychological interventions which promote enduring personal coping resources and flourishing may prove more effective in reducing doping propensity and behaviour. As such, this exploratory work shall examine the applicability of the Light Quartet (e.g. hope, optimism, resilience, and perseverance) as a theoretical base for future anti-doping interventions.

Design: Cross-sectional.

Methods: Opportunity sampling shall be employed to recruit individual and team-based athletes aged 16+ of all participatory levels from across the UK. Psychometrics measuring hope, optimism, resilience, perseverance shall be completed. Attitudes towards doping, as well as supplement and doping usage shall also be psychometrically measured. Following the completion of data collection, a multivariate analysis shall be undertaken.

Anticipated results: Preliminary evidence is expected to be found supporting the application of The Light Quartet in guiding athlete anti-doping interventions.

Posters

Impulsivity and emotion dysregulation

Siham Albesisi, *University of Sheffield*

According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, (DSM-V), inattention and hyperactivity and/or impulsivity are three clusters of attention deficit hyperactivity disorder (ADHD) symptoms. However, emotion dysregulation is present in many ADHD adults and cause a serious defect. The researcher defined 'emotion dysregulation' –a disruption of an individual's ability to modify an emotional state to promote adaptive, goal-oriented behaviours - as a central component of the suite of ADHD symptoms (Shaw et at., 2014).

We aim to explore whether impulsiveness is related to emotion dysregulation (ED), and whether both are related to more general issues concerning the control of impulsive behaviour in a non-clinical population with varying levels of ADHD-like traits.

399 participants were undertaking a neuropsychological task, the Iowa gambling task IGT and the Go/No-go task next, filling several scales in an online questionnaire, measuring classic ADHD symptoms and emotion dysregulation.

To conclude that participants with high levels of ADHD show impairment of the inhibition process in both motor control and decision-making and that this was correlated with scores for ASRS and emotion dysregulation.

Exploring prioritisation effects across different forms of binding in working memory

Hatice Cinar, *University of Leeds*
Richard Allen, *University of Leeds*
Amanda Waterman, *University of Leeds*
Amy Atkinson, *Lancaster University*

Objectives: Working memory has a limited capacity system, certain methods can be used to direct attention to specific items like prioritisation. Prioritisation aims to direct attention and improve recall for certain items. Another working memory function is the regulation of the binding between features of items. The binding types investigated in this study are unitised (coloured shape), and spatially separated binding (shape and colour presented simultaneously in separate, vertically adjacent locations). Across three experiments, we investigated whether prioritisation has a differential effect on different types of binding.

Design: A 2x2x4 repeated measures design was implemented in each experiment, with two types of binding conditions (unitised and spatially separated), two priority conditions (priority and no-priority) and four probed serial positions (SP 1:4)

Methods: In first two online experiments twenty-seven and in third in-person experiment thirty-one English-speaker students were recruited from the University of Leeds and administered using Gorilla. Four shape-colour pair stimuli in each trial were serially presented, after which the test trial followed which was asked to recall the name of the colour it was paired with.

Results: The results of the third experiment show the main effect of serial position and binding and the significant interaction between serial position and priority.

Conclusions: Throughout the three experiments, it is observed that articulatory suppression allows the emergence of the priority effect by preventing rehearsal. Participants significantly better in unitised condition than spatially separated thus binding between features require attention. The privileged stage of most recent item was consistent throughout three experiments.

The embodied nature of deception

Teresa Limata, *University of Turin*
Monica Bucciarelli, *University of Turin*

Objectives

This study aimed to explore the embodied nature of deception and its connection to counterfactual thinking, and tested the prediction that participants who were asked to lie about or imagine a counterfactual scenario they had listened to, were more likely to refer to aspects of the scenario described by action verbs than by attention verbs, compared to participants who were asked to report what impressed them most in the scenario.

Design

Experimental factors were the types of verbs (action/attention) in the story and the groups to which participants were randomly assigned (truth-teller/liar/counterfactual). The dependent variable was the first item that participants changed or named.

Methods

The participants were thirty students from the University of Torino. They listened to a story with 6 action verbs and 6 attention verbs and their task was to change an element of the story (counterfactual and liar groups) or to name an element of the story that had impressed them the most (truth-teller group).

Results

As predicted, participants' performance was more dependent on action verbs compared to attention verbs, but analysis by group revealed that this was only true for the liar group. As predicted, both the counterfactual and the liar groups modified attention verbs and action verbs to the same extent, while the truth-teller group modified more attention verbs compared to the other groups, but named action verbs to the same extent as the counterfactual and liar groups changed them.

Conclusions

Deception and counterfactual thinking rely in part on the same motor processes.

The riddle of human probability judgments: bridging the gap between internal estimates and responses

Zo Ebelt, *City University London*
Jerome Busemeyer, *Indiana University Bloomington*
Adam Huang, *Indiana University Bloomington*
Emmanuel Pothos, *City University London*

Objectives: Although human decision-making is thought to be rational, in the sense of consistency with the laws of Bayesian probability, research has repeatedly unveiled incongruencies between human decisions and Bayesian inference. An influential tradition to bridge the gap between expectation and observations has relied on alterations of the Bayesian framework, typically including sampling mechanisms or assumptions about cognitive limitations. We are tackling this challenge from a different point of view, by expanding the Bayesian framework to the framework of quantum probability, which uses the maths (but not the physics) of quantum mechanics to explain putative irrational judgements.

Design: We collected the largest data set (N=1162, 78 judgments per participant) for probability judgments to date. We asked participants online to evaluate the chances of Trump and Biden winning the US elections in 2021 (data collection was conducted just before the elections). The range of probabilistic judgments was specified with a view to include several possible markers of "irrational" decision-making, that is decision making which may conflict with Bayesian models of inference.

Results: We showed that judgments which are classically considered irrational are abundantly present in our data. The pattern of these results is better explained by a quantum decision model, than by previous models relying on Bayesian inference.

Conclusions: The comparison of quantum and Bayesian models indicates that human-decision-making cannot be fully understood by applying Bayesian probability alone and, so, our understanding of what ought to be rational is currently incomplete. Our results support the idea that human decision-making is sometimes better described by quantum models, which incorporate ideas like contextuality, interference, and order effects.

A latent profile analysis of COVID-19 conspiracy beliefs: Associations with thinking styles, mistrust, socio-political control, need for closure and verbal intelligence

Claire Jones, *University of Wolverhampton*
Niall Galbraith, *University of Wolverhampton*
David Boyda, *University of Wolverhampton*
David Martin, *University of Wolverhampton*
Kimberley Jackson, *University of Wolverhampton*

To date, research has largely examined commonalities in conspiracy theory belief, however it is important to identify where these commonalities may differ. The aim of the present research was first to distinguish between typologies of COVID-19 conspiracy belief and explore demographic, social cognitive factors associated with these beliefs. Secondly, we aimed to examine the effects of such beliefs on adherence to relevant guidelines.

Participants (N = 319) were recruited online and rated well known COVID-19 conspiracy theories, completed measures of thinking style, socio-political control, mistrust, verbal intelligence, need for cognitive closure and demographic information. Participants also rated the extent to which they followed government guidelines.

Latent profile analysis suggests three profiles of COVID-19 conspiracy beliefs with low, moderate, and high Covid conspiracy belief profiles and successively stronger endorsement on all but one (coronavirus was created in a biochemistry lab) of the Covid-19 conspiracy theories. While high conspiracy theory beliefs were associated with greater mistrust, lower socio-political control, verbal intelligence and, adherence to guidelines, the study also highlighted some unexpected findings. While intuitive thinking was associated with high conspiracy beliefs, the relationship for analytic thinking was not linear and moderate, rather than high conspiracy beliefs, were associated with greater analytic thinking. In addition, need for cognitive closure was found to be lowest in those with high conspiracy beliefs.

The present study highlights relevant social cognitive factors associated with holding COVID-19 conspiracy theory beliefs and taken as a whole, is consistent with the existential threat model of conspiracy theories.

Building a Global Visual Language: What Do 1,000 People Think of 1,000 Icons?

Daniel Earnshaw, *Swansea University*
Cris Izura, *Swansea University*
Irene Reppa, *Swansea University*

Background & Objectives: Icons, symbols, and signs represent a visual language that facilitates communication because they convey large amounts of information in single units intended to be understood by everyone irrespective of culture or language. The development of a visual language of icons and symbols that is accessible, inclusive, diverse, and neutral is of paramount importance now that the number of digital interfaces that use such language keep expanding at a global level. However, existing knowledge on how icons are perceived comes from a very narrow demographic, with the built-in assumption that such norms apply universally for all. This study is the first to report on a largely heterogeneous sample in terms of age, occupation, education, geographic location, cultural and linguistic backgrounds, contributing new knowledge about how icons are perceived by previously understudied groups.

Design & Results: A cross-sectional design is being employed to gather ratings on 7 key icon and symbol characteristics: aesthetic appeal, complexity, concreteness, semantic distance, valence, affect, and order of learning. Data is collected from a diverse population (N~1,000), using existing networks and world-wide reaching platforms (e.g., Lab-in-the-Wild). Linear mixed modelling will be applied to the data with key demographic variables as predictors of visual appeal.

Expected Impact: The final data set will contribute to the identification of several factors that impact people's understanding and preferences of icons. The new norms will constitute a significant step towards an understanding of the rapidly evolving visual language of symbols and icons.

In the heat of the moment: investigating the impact of extreme temperatures on the cognitive function of fire fighters.

Lucy Ferrie, *University of Salford*
Martyn Matthews, *University of Salford*
Steve Pearson, *University of Salford*
Brian Highlands, *University of Salford*
Catherine Thompson, *University of Salford*

Research suggests that extreme temperatures have a negative impact on cognitive performance. For example, very high temperatures limit working memory capacity and reduce attentional vigilance. This can have serious implications for individuals who work under extremely hot conditions, for instance fire fighters. Whilst there is experimental evidence to show the effects of heat stress on cognition, much of this research has been conducted in laboratory settings. The present study aims to explore the effects of heat stress on the cognition of fire fighters in a real-life fire-fighter training scenario. Fire-fighters undergoing normal training were asked to complete a battery of cognitive tests (the N-Back, a Sustained Attention to Response Task, and a Wisconsin Card Sorting Task) before entering and navigating a burning building heated to 200°C. They then completed the same tasks on exiting the building, then 20 minutes and 40 minutes later. During the testing period, core body temperature and heart rate were measured using a telemetric pill and a physiological state monitor. Working memory, attention, and cognitive flexibility after exposure to the extreme temperatures was compared to performance at baseline, with the prediction that performance would decrease. Measuring cognition at 20 and 40-minutes post-training allows measurement of the time-course of recovery, therefore this study has the potential to inform operational guidelines around re-entry decisions within the fire and rescue service.

Reward-related future thinking and delayed gratification in children

Ciarán Canning, *Queen's University Belfast*
Teresa McCormack, *Queen's University Belfast*
Agnieszka Graham, *Queen's University Belfast*

Objectives

Cuing adults to imagine their personal futures enhances prudent choice in delay discounting tasks. However, little research has examined whether such cueing also reduces discounting in children. We assessed the effect of episodic future thinking (EFT) on delay of gratification in primary schoolers using, for the first time, EFT cues related to the rewards on offer.

Design

137 8-11-year-olds were assigned to one of three conditions: i) EFT (imagine spending money in the future), ii) Imagine Place (imagine being in a certain place), or iii) No Cue. They were cued on each trial of two tasks: a delay discounting task with hypothetical rewards and a delay choice task involving choices between real rewards (coins that could be swapped for treats). Hierarchical multiple regressions controlling for age were conducted.

Results

In the delay discounting task, the Imagine Place group showed significantly higher discounting than the EFT group (std. β = -0.26, p = .010), and the No Cue group (std.β = -0.29, p = .004). In the delay choice task, the Imagine Place group made significantly fewer delayed choices than the EFT group (std.β = -0.22, p = .018). However, the EFT group did not differ from the No Cue group in either task.

Conclusions

The non-significant difference between the EFT and No Cue conditions supports previous findings suggesting children struggle to benefit from EFT cues. Poorer performance of the Imagine Cue group suggests that cued thinking is too cognitively taxing for children, using up cognitive resources required to delay gratification.

FamFac - Development of a famous faces database.

Paulo Rodrigues, *University of Beira Interior*
Fábio Monteiro, *University of Beira Interior*
Isabel M. Santos, *University of Aveiro; William James Center for Research; CINTESIS@RISE*
Pedro Bem-Haja, *University of Aveiro; CINTESIS@RISE*

Familiar and unfamiliar face processing elicits different behavioral and electrophysiological responses. However, the results of investigations that tried to disentangle the mechanisms that underpin these phenomena may have been biased by several confounding variables — e. g., significant variation in low-level proprieties of experimental stimuli, varying degrees of familiarity with famous faces between participants. Objectives: Taking this into account, we developed a database comprised of famous faces whose contrast and mean grey value have been standardized by an algorithm developed in Matlab. The database and the algorithm are freely available online. Design: Each image was converted to grayscale, resized, and rotated. An elliptical mask was applied to every face to remove its external features. Then, the images were processed by the algorithm developed in Matlab. Results: The algorithm successfully ensured that the contrast and mean grey value of each image did not differed significantly from the contrast and mean grey value of the entire stimuli set. Additionally, the level of familiarity of the famous faces included in this dataset was evaluated by a sample of Portuguese college students. 46 famous faces scored above the cutoff point used by other investigations to deem a face as highly familiar (75; scale from 0 to 100). Conclusions: Because we homogenized the contrast and mean grey value of each image, these stimuli should not elicit the confounding effects verified in past studies that evaluated differences between familiar and unfamiliar processing. Additionally, these stimuli can be freely used in studies with this scope.

An eye tracking investigation of face drawing accuracy in non-artists

Neil Harrison, *Liverpool Hope University*
Letizia Palumbo, *Liverpool Hope University*

Objectives

To render an accurate depiction of a face, a drawing should reproduce the correct relative spatial positions of the facial features. However, non-artists are generally poor at drawing faces and commonly position the eyes too high up. The aim of this study was to test an attentional salience account of vertical eye-drawing errors, which proposes that areas of the to-be-depicted face that are allocated most attention are exaggerated in size within the drawing.

Design

A correlational design tested if there was an association between the proportion of attention allocated to the lower half of the face and the magnitude of errors in vertical eye placement.

Methods

Twenty-six participants (all non-artists) copied a face from a photograph while eye-tracking data was collected. Participants viewed a photograph of the face for 30 seconds, and then had 10 minutes to complete their drawing.

Results

Participants positioned the eyes higher on the head in their drawings compared to the photograph. An eye position ratio for the drawings was calculated by dividing the eye height by the head height. Total fixation duration was calculated separately for the upper and lower halves of the face photograph. We found a significant positive correlation between eye position ratio and the relative proportion of fixations in the lower half of the face photograph.

Conclusions

Results supported an attentional salience account of face drawing errors, in which the half of the to-be-depicted face that was given greater relative attention was allocated a greater proportion of vertical space within the drawing.

Face super-recognisers: Does their advantage over controls extend more to recalling Ms. Baker's name than to remembering the Baker's occupation?

Josh Davis, *University of Greenwich*
Katie Read, *University of Greenwich*
Elena Belanova, *University of Greenwich*

The ability to recognise a face and to name that face is important in many social and policing contexts. Research has revealed large individual differences in the population's ability to recognise the identity of unfamiliar faces, with so called, super-recognisers (SRs), lying at the top of this spectrum. The current research employed the Baker/baker paradigm to test the hypotheses that super-recognisers of faces would also be superior at learning face-proper name and face-semantic information (i.e., occupation) associations. Participants (n = 546), defined as SRs or typical-range ability controls based on scores on two previous tests, had up to 5 attempts to demonstrate accurate learning of 20 face-name/occupation associations. Half the trials were given ambiguous names (e.g., Mr Baker, the baker – never attached to the same face), half regular names (e.g., Miss Roberts, the librarian). Consistent with previous literature and in line with predictions, a mixed 2 (Ability: SR, control) x 2 (Category: name, occupation) x 2 (Ambiguity: ambiguous, regular) ANOVA revealed face-occupation recall accuracy was superior to face-name recall. Accuracy of ambiguous-face associations was better than regular-face associations, albeit, only with face-name and not face-occupation associations. Crucially, SRs significantly outperformed controls at learning face-category associations across all conditions, although effect sizes for the advantage of SRs over controls were stronger for face-name than face-occupation associations. These findings contradict a common claim made by SRs, that their face-naming skills are poor, while enhancing theoretical understanding of the consistency of individual differences in ability across different modes of identity.

Synchrony or asynchrony effects in face processing: Can early ERPs help disentangle?

Paulo Rodrigues, *University of Beira Interior*
Isabel M. Santos, *University of Aveiro; William James Center for Research; CINTESIS@RISE*
André Silva, *University of Aveiro*
Pedro Bem-Haja, *University of Aveiro; CINTESIS@RISE*
Fábio Monteiro, *University of Beira Interior*

Objectives: Chronotype and time-of-day can modulate cognitive performance in a pattern that is known as "synchrony effect", i.e., better performance for morning and evening-types during their preferred time-of-day. However, recent behavioural evidence suggests that face recognition might not comply strictly to this pattern, with results being quite mixed. We sought to understand if performance on face processing tasks is modulated by those chronobiological variables and if early ERP correlates can help clarify the effects.

Design: A mixed design was used, with chronotype as a between-subjects factor and time-of-day as a within-subjects factor.

Methods: Thirty-two participants (16 evening-types, 16 morning-types, assessed with the Morningness-Eveningness Questionnaire) performed the tasks twice, with different counterbalanced stimuli, at their peak and off-peak times (7:30am and 7:30pm, counterbalanced), with a one-week interval between sessions, while their EEG was recorded. One task was a modified sequential version of the Glasgow Face Matching Task; the other task was a Famous Face Recognition Task, including famous and non-famous individuals.

Results: Although no significant chronotype or time-of-day effects were observed on behavioural performance in either task, results showed a significant time-of-day x chronotype interaction on the P100 component amplitude for both tasks. Morning-types registered higher amplitudes in the evening session, compared to the morning session, regardless of type of stimuli. No effects were found for the N170 component in either task.

Conclusion: An enhanced early visual attention processing for morning-types during their off-peak time may help maintain behavioural performance levels. No (a)synchrony effects were evident on more face-specific processing stages.

Recognising the same person at different ages: Mixed evidence for an ageing asymmetry effect

Sarah Lawrence, *Open University*
Laura Sexton, *Open University*
Ailsa Strathie, *The Open University*
Graham Hole, *University of Sussex*
Mila Mileva, *University of Plymouth*

Objectives: Human faces change considerably as they age. The present project aimed to (1) determine how well we are able to recognise faces across changes in age, and (2) establish whether there is an ageing asymmetry effect. Are younger instances of an identity more difficult to recognise than older instances?

Design: We used statistical models of face recognition (PCA+LDA) and conducted four behavioural studies to examine whether an ageing asymmetry effect is present for images taken across the adult lifespan.

Methods: MATLAB/Interface software was used for PCA+LDA analysis. Behavioural data was collected from Prolific Academic, N=60-65 per experiment. Participants/models were trained on a set of young adult faces (e.g., 20-30 years old), with each facial identity depicted in multiple images. The ability to recognise instances of the trained identities at an older age (e.g., 60-70 years old) was then tested (young-to-old). There was an additional condition in which the age of the training/test faces was reversed (i.e., training with older instances and testing with younger instances of the same identities; old-to-young).

Results: An ageing asymmetry effect was present in the modelling data, with greater accuracy for the young-to-old condition than for the old-to-young condition. However, no evidence was found for an ageing asymmetry effect across the behavioural experiments; participants were equally accurate at recognising faces from older and younger images, regardless of the age of the training set.

Conclusions: The results highlight a need to understand the differences between computational models of face recognition and humans (in addition to similarities).

Sequential modulation: The moderating effect of affectively significant visual stimuli

Kelly Dawson, *The University of Kent*
Dinkar Sharma, *The University of Kent*

Monitoring the environment considering relevant task demands, inhibiting unhelpful behaviours and switching to helpful ones are indictive of cognitive control (CC). One example of CC is the decrease in the Stroop effect (I-C) when the previous trial is incongruent (I) compared to when it is congruent (C). This effect has been named sequential modulation (SM). Although it has been suggested that affectively significant positive and negative visual stimuli can modulate CC and SM, this has not been demonstrated conclusively. In experiment one 66 University of Kent students took part in a selective attention task interspersed with task irrelevant positive (depicting sexual scenes and reward)/neutral or negative (threat-based images)/neutral visual stimuli. A 4-way-ANOVA illustrated a significant interaction between previous trial congruency, current trial congruency, picture type (neutral/emotional) and emotion group (positive/negative) ($F(1,60)=3.991$, $p=.02$, $\eta p2 =.62$). Furthermore, negative images disrupted SM when compared to neutral ones ($F(1,33)=5.593$, $p=.03$, $\eta p2 =.15$) but positive images did not ($F(1,27) = .534$, $p=.534$, $\eta p2 = .19$). In experiment two 57 undergraduate students took part in the same experimental procedure but the positive images were exclusively baby faces. No significant 4-way interaction was observed ($F(1,52)=.732$, $p =.396$, $\eta p2 =.014$). However, emotional images prevented SM ($F (1,52)=.217$, $p=.643$, $\eta p2 =.004$) whereas neutral images did not ($F (1,52)=6.703$, $p=.012$, $\eta p2 =.114$). These findings indicate that positive and negative visual stimuli can disrupt SM but that affective significance is not an adequate explanation. Survival of not only the individual but also of the species may provide better explanations.

Individual differences in the Saving-Enhanced Memory Effect: An online conceptual replication.

Becca Flanagan, *University of Hertfordshire*
Nicholas Shipp, *University of Hertfordshire*
Mike Page, *University of Hertfordshire*
George Georgiou, *University of Hertfordshire*

Objectives: Previous research has demonstrated that saving a to-be-remembered word list enhances recall for a second list, known as the Saving-Enhanced Memory Effect. This current research aimed to conduct an online, pre-registered, conceptual replication of this phenomenon, and also explore the influence of individual differences (screen time, preference for offloading, and working memory capacity) on the magnitude of the saving-enhancement effect.

Design: Sixty-four participants were recruited through Prolific to complete the study via Gorilla. In each one of six trials, participants' recall was recorded for a subsequent word list, following either the saving or deletion of a different, previously learnt, list. The mean recall for the second word list across save and delete conditions was compared. The study also explored whether the difference in mean recall across conditions was related to performance on a digit span task, objective measure of screen time (obtained from participants' mobile devices), and offloading preference.

Results: Participants recalled more items on save trials compared to delete trials. However, measures of individual differences were not found to predict the difference in mean recall between save vs delete conditions.

Conclusions: The Saving-Enhanced Memory Effect was replicated in an online domain, however the effect was found to be smaller than in previous studies. The examined individual differences only accounted for limited explained variance in the effect. Future work should further investigate other potential explanatory factors, e.g., meta-cognition, other digital offloading behaviours and preferences, and measures of screen-use.

Self-biases and positive-biases are distinct, but enhanced by self-positive interactions

Naomi Lee, *University of Aberdeen*
Jie Sui, *University of Aberdeen*

Objectives: Robust self-biases and positivity-biases are well documented, but whether they are distinct, or self-biases are purely an extension of positivity biases (due to the self being intrinsically positive) remains puzzling. This work addressed this debate by exploring the effect of person-emotion interactions on self- and emotion-biases.

Design: A within-subjects design was used to allow comparison between multiple experimental manipulations.

Methods: Evaluative priming was combined with a standard shape-label matching task. In experiment 1 positive and neutral emotional primes preceded personal targets. In experiment 2 negative and neutral emotional primes were used. To explore the self relative to close and distant others, self and stranger primes were used in experiment 3, and self and friend primes in experiment 4. 201 healthy individuals recruited from university and online populations completed online tests. Data in the person or emotion matching task was analysed using generalised linear mixed effects models.

Results: Happy primes increased target self-bias magnitudes. Similarly, self primes increased target positivity-biases. The positivity bias in primes was only present in self targets and the self-bias in primes was only observed in happy targets.

Conclusions: The results suggest an overlap in the underlying mechanisms of the self- and positivity-biases, although the self-bias is not simply an extension of the positivity-bias. Further, the self and positive emotions are inherently linked indicating a strong positive self view in healthy individuals. This novel task has potential applications within the clinical setting to increase understanding of bias changes within mental health disorders.

Can younger and older adults engage in prioritisation when following instructions within a working memory paradigm?

Asiyah Alzahrani, *University of Leeds*
Amanda Waterman, *University of Leeds*
Richard Allen, *University of Leeds*

Previous evidence has demonstrated that adults can prioritize valuable individual items in verbal and visual working memory. However, no research has investigated the ability to engage in prioritisation within a following instructions paradigm. In four online experiments (N=40 in each), we investigated this in older (60-75 years) and younger (18-30 years) adults. Participants were asked to listen to instruction sequences containing five action-object pairs (e.g., spin the star, tap the square…) for immediate serial recall. Participants completed two conditions, with 12 sequences in each condition. For the no-prioritisation condition all action-object pairs were worth the same number of points. For the prioritisation condition one action-object pair was worth more points than the others: in Experiments 1 & 2 the third action-object pair (serial position 3 – SP3) was worth more points, and in Experiments 3 & 4 the second action-object pair (SP2) was worth more points. Both older and younger adults showed a boost to the more valuable pair in the prioritisation condition compared to the no-prioritisation condition. Overall there was a trend for older adults to perform less well, but this was not consistent across all studies. Further, for younger adults, prioritisation at SP3 and SP2 came at a cost to the first serial position, with worse performance at SP1 in the prioritisation condition compared with the no-prioritisation condition. These results have practical and theoretical implications for following instructions, working memory, and cognitive ageing.