SOCIAL COMMUNICATION ACROSS THE LIFESPAN

27th-29th June 2018

Funded by the European Research Council
Welcome to this scientific meeting exploring Social Communication Across the Lifespan. This three day conference will bring together researchers from across Psychology, Neuroscience, and Linguistics to examine innovative, state-of-the-art research exploring how social communication changes across the lifespan. From research with children, adolescents, adults, and into old age, this conference will examine this key research area from a variety of different perspectives, using a number of different methods.

The conference is generously funded by the European Research Council (ERC).

**Organisers:** Lizzie Bradford, Victoria Brunsdon, and Heather Ferguson

**Location:** Keynes College, University of Kent, Canterbury, Kent, CT2 7NP

**Dates:** Wednesday 27th June - Friday 29th June

**Keynote Speakers:**

- Paula Rubio-Fernandez (MIT and University of Oslo):
- Iroise Dumontheil (Birkbeck University):
- Ian Apperly (University of Birmingham):
- Heather Ferguson (University of Kent):
- Elena Cavallini (University of Pavia):
Talks

All sessions will be held in KLT4 on the ground floor of Keynes College. The lecture theatre has a data projector available for PowerPoint presentations. Presenters may provide their own laptops and connector leads, or bring USB keys for the on-site computers. Any queries about facilities should be sent to CogSoCoAGE@kent.ac.uk. Talks will be 20 minutes (consisting of 15 minutes presentation and 5 minutes for questions).

Poster Sessions - Drinks Reception

The poster session and drinks reception will be held on Wednesday evening at 5:30pm in the Keynes Atrium. Delegates may put up posters from 3:30pm and should take them down at the end of the session. Posters should be a maximum of A0 size, in portrait orientation.

Wifi

Wifi access will be available via eduroam (see www.kent.ac.uk/itservices/wireless/index.html) or through the University's guest wifi services (see www.kent.ac.uk/itservices/wireless/guest.html).

Catering

There will be tea/coffee available during breaks, and a buffet lunch will be provided on each day of the conference. In addition, there are a number of cafes on the University of Kent campus, including Dolce Vita (located within Keynes College), Caffé Nero, and The Gulbenkian Café.

Local Bus Services

The Unibus runs every 8-15 minutes and the Triangle bus 4X runs every 30 minutes from Canterbury Bus Station. Both services stop at the University campus. Alight at the bus turning circle on University Road, which is a short walk from Keynes College.
Conference Dinner

The conference dinner will be held on Thursday 28th June at 7pm at The Old Brewery Tavern, Stour Street, Canterbury, CT1 2NR (www.theoldbrewerytavern.co.uk). This is in the city centre and is approximately a 30 minute walk or 10 minutes by taxi from the University. Please note the meal must be booked by 31st May; if you booked a place at the conference dinner, you will receive a token when registering at the conference that lists the food items you requested.

Congratulations to the winners of our post-graduate travel bursary awards:

Sara Mosteller
Hannah Pickard
Gideon Salter
Gavin R. Stewart
Rashma Hirani

Erik C. Nook
Irene Ceccato
Kathryn F. Jankowski
Federica Meconi
Hayley Hunt

Lucy Anne Livingston
Wednesday 27th June

9:00am  Registration

9:30am  Welcome (Heather Ferguson)

9:45am  Keynote: Children and adults use referential contrast for efficient communication  
        Paula Rubio-Fernandez

10:45AM  TEA/COFFEE BREAK

Session 1

11:15am  Mechanisms for Engendering Cooperation in Preschool Children  
        Tal-Chen Rabinowitch (University of Washington)

11:35am  Communicative eye contact signals a commitment to co-operate  
        Barbora Siposova, Michael Tomasello, & Malinda Capenter  
        (University of St Andrews/University of Warwick)

11:55am  'Tigers have stripes' doesn't mean 'A tiger has stripes'. How our conceptual knowledge is organized by linguistic principles  
        Kim Fuellenbach (University of Oxford)

12:15pm  Enhancing children's theory of mind: do conversations play a role?  
        Serene Lecce & Federica Bianoco (University of Pavia)

12:35pm  LUNCH (KEYNES ATRIUM)

Session 2

2:00pm  Charting the development of emotion language and emotion representations from childhood to adulthood  
        Erik C. Nook (Harvard University)

2:20pm  Irony processing in Adolescents: an ERP study  
        Irene Symeonidou, Iroise Dumontheil, Wing Yee Chow, & Richard Breheny (University College London)

2:40pm  Social cognition in adolescence: Using eye-tracking to study belief-attribution abilities  
        Elisabeth Bradford, Victoria Brunsdon, & Heather Ferguson (University of Kent)
3:00pm  Compensation: A candidate mechanism for explaining how autistic people can show good social skills despite poor theory of mind
Lucy Anne Livingston, Emma Colvert, Punit Shah, Patrick Bolton, & Francesca Happé (Kings College London)

3:30pm  Tea/Coffee Break

4:00pm  Keynote: Social cognition during adolescence
Iroise Dumontheil

5:00pm  Break (on own)/Poster set up

5:30pm  Poster Session and Wine Reception (Keynes Atrium)

7:00pm  Poster take down
Thursday 28th June

9:00am Registration

9:30am Keynote: The mismeasure of mindreading
Ian Apperly

10:30am Tea/Coffee Break

Session 3

11:00am Individual differences in children's pragmatic ability: a review of associations with formal language, social cognition and executive functions
Danielle Matthews, Kirsten Abbot-Smith, & Hannah Biney (University of Sheffield)

11:20am Self-conscious emotion processing in adolescents with ASD: Over-reliance on learned social rules may serve as compensatory strategy for less spontaneous mentalizing
Kathryn F. Jankowski & Jennifer H. Pfeifer (University of Oregon)

11:40am Cognitive and Affective Theory of Mind in children and adolescents with and without ASD
Elisa Back, Hannah Cotmore, Jessica Dalebout-Campbell, Marjan Darabi-Hammond, Jessica Ganter, & Annette Williams (Kingston University)

12:00pm Real time language production and Theory of Mind assessment in Autism Spectrum Disorder
Hayley Hunt, Elisa Back, & Jo Van Herwegen (Kingston University)

12:30pm Lunch (Keynes Atrium)

Session 4

2:00pm Is measuring (a)typical social cognition on the web as good as the lab?
Punit Shah (University of Bath)

2:20pm Can synchronised action promote perspective-taking?
Jess Wang (Lancaster University)
2:40pm  Uncovering the role of premotor cortex in action understanding using transcranial magnetic stimulation
Caroline Catmur, Emma L. Thompson, & Geoffrey Bird (King’s College London)

3:00pm  "Oh yeah, thrill of thrills!" What we learn about the use of ironic comments in child-directed speech from the analysis of the Providence corpus of CHILDES
Natalia Banasik-Jemielniak (University of Warsaw)

3:30pm  TEA/COFFEE BREAK

4:00pm  Keynote: Social communication in middle and older adults
Heather Ferguson

7:00pm  Conference Dinner at The Old Brewery Tavern
Friday 29th June

9:00am  Registration

Session 5

9:30am  The role of visual attention as mechanism for interpersonal communication and behavioural coordination in social hierarchies
Matthias S. Gobel (University of California)

9:50am  The effect of social cues on regulation of personal space in children and adults: a study using immersive VR
D. Michael Burt (Durham University)

10:10am Empathy draws on autobiographical memories
Federica Meconi, Ian Apperly, & Simon Hanslmayr (University of Birmingham)

10:30am  TEA/COFFEE BREAK

Session 6

11:00am Visual perspective taking in young and older adults
Andrew Martin & Marcus Meinzer (University of Queensland)

11:20am The ageing mirror system and its relationship to social cognition
Victoria Brunsdon, Elisabeth Bradford, & Heather Ferguson (University of Kent)

11:40am Social cognition in ageing: can motivation explain age-related differences?
Irene Ceccato, Serene Lecce, Elena Cavallini, & Ted Ruffman (University of Pavia)

12:00pm Prosocial behavior in aging: which factors explain age-related differences in a social-economic decision making?
Alessia Rosi, Marta Nola, Elena Cavallini, & Serena Lecce (University of Pavia)

12:30pm LUNCH (KEYNES ATRIUM)

1:30pm  Keynote: Promoting Theory of Mind in aging: studies on training benefits, trend, and predictors of change
Elena Cavallini

2:30pm  Concluding Remarks (Heather Ferguson)

3:00pm  End of Conference
Poster Index

1. **Face-scanning embedded in social interaction: evidence from a gaze-contingency paradigm**  
   Jolie Keemink, Maryam Keshavarzi-Pour, & David Kelly (University of Kent)

2. **Cultural differences in dyadic interaction using head-mounted cameras**  
   Prerna Aneja & John Spencer (University of East Anglia)

3. **Probing the neural and behavioral mechanisms of spatial coordination during interactive word learning in early development**  
   Sara Mosteller, Larissa K. Samuelson, Sobanawartiny Wijeakumar, & John Spencer (University of East Anglia)

4. **The processing of emotional facial expressions in infancy**  
   Jonathan E. Prunty & David Kelly (University of Kent)

5. **Identification of Social Looking behaviours in Infancy**  
   Silvia Panella Peral, Luke Beardon, & Tim Jay (Sheffield Hallam University)

6. **Cognitive underpinnings of irony understanding in children**  
   Maria Zajaczkowska, Kirsten Abbot-Smith, & David Williams (University of Kent)

7. **Partner specificity and representational flexibility in children**  
   Nera Bozin, Mafalda Costa, & Erika Nurmsoo (University of Kent)

8. **Previously shared information impacts performance in the change of location false-belief task**  
   Gideon Salter & Richard Breheny (University of St Andrews)

9. **Dynamics of single word production from childhood to adolescence and adulthood**  
   Tanja Atanasova, Raphaël Fargier, Pascal Zesiger, & Marina Laganaro (University of Geneva)

10. **Ratings of trustworthiness from adult voices is consistent whether rated by children or by adults**  
    Gaby Mahrholz, Hannah Greenwood, Benedict Jones, & Phil McAleer (University of Glasgow)
11. Through the eyes of a teenager: complexity of real-time Theory of Mind inferences in language comprehension
   Irene Symeonidou, Heather Ferguson, & Richard Breheny (University College London)

12. Recognising microexpressions of mental states across the lifespan.
   Rashma Hirani & Elisa Back (Kingston University)

   Gavin R. Stewart, Martha Cottam, & Rebecca Charlton (King's College London/Goldsmiths, University of London)

   Hannah Pickard & Francesca Happé (King's College London)

15. Listening in your shoes: social perspective-taking and verbal reference interpretation by children with autism
   Kirsten Abbot-Smith, David Williams, & Danielle Matthews (University of Kent)

16. Individuals with and without Autism Spectrum Disorder anticipate the intended message based on speaker's voice: evidence from eye-tracking
   Mahsa Barzy, Jo Black, David Williams, & Heather Ferguson (University of Kent)

17. Computerised working memory based cognitive remediation therapy does not affect Reading the Mind in the Eyes test performance or neural activity during a Facial Emotion Recognition test in psychosis
   April Hargreaves, David Mothersill, Rachael Dillon, Marco Castorina, Emilia Furey, Andrew J Fagan, James F Meaney, Brian Fitzmaurice, Brian Hallahan, Colm McDonald, Til Wykes, Aiden Corvin, Ian H Robertson, & Gary Donohoe (National College of Ireland)

18. Remediating brain deficits in excessive use of internet through a short term training
   Yi-Yuan Tang (Texas Tech University, USA)

19. An investigation on Executive Functions and Theory of Mind
   Martina De Lillo, Victoria Brunsdon, Elisabeth Bradford, & Heather Ferguson (University of Kent)
20. **Bilingualism and social flexibility**  
Marie-France Champoux-Larsson, Alexandra Dylman, & Francisco Esteves  
(Mid Sweden University)

21. **An exploratory study on nomophobia**  
Antonio Fidalgo, Janine Streuli, & Opal Gibbs (University of East London)

22. **Making Student-Centered Discourse Work**  
Deanna Kuhn (Teachers College Columbia University)
Abstracts

Wednesday 27th June

Session 1

Mechanisms for Engendering Cooperation in Preschool Children
Tal-Chen Rabinowitch (talchenr@uw.edu), University of Washington

Learning to cooperate with others is a key aspect of social development. One culturally universal form of collaborative interaction between people is music. Indeed, some evolutionary biologists argue that joint musical engagement may have played a role in facilitating human social evolution and cooperative activity in the first place. A prominent feature of musical interaction is synchronous rhythmic movement of the interacting individuals. To address the effects of joint synchronous movement on cooperation during development we constructed a swing-like device, on which previously unacquainted 4-year-olds, were randomly assigned to be swung either synchronously or asynchronously with each other. In study 1 we compared the effects of these two treatments, and a baseline condition, on the performance of two types of tasks involving collaborative problem-solving. After treatment, children from the synchrony group were significantly better than the asynchrony and baseline groups at performing the problem-solving tasks collaboratively. Furthermore, the synchronized children spontaneously signaled their intentions one to the other while problem-solving, a strategy that may underlie their improved collaboration. In study 2 we positioned a barrier with different levels of transparency between the two swings and found that even when the children could only see a blurry silhouette of each other while moving together, they still performed better following the synchrony treatment. I will describe these studies, provide a theoretical discussion of the role of music and synchrony in children’s development of social cognition, and discuss the underlying perceptual-cognitive mechanisms by which short-term experience with synchrony and rhythmicity influence the interpersonal behavior of preschool children.

Communicative eye contact signals a commitment to cooperate
Barbora Siposova (barbora.siposova@warwick.ac.uk), Michael Tomasello, & Malinda Carpenter, University of St Andrews/University of Warwick

Communication and commitments support mutual understanding and successful cooperation. However, there is a long-standing debate about how commitments come about and the role of different types of communication in making them. Several theorists have argued that one can promise without using verbal
statements or conventional acts (such as saying, 'I promise') but different accounts of how promissory obligations come into existence have been proposed. To inform this theoretical debate, we experimentally investigated whether even minimal, nonverbal behaviour can be taken as a commitment to cooperate, as long as it is communicative. Five- to 7-year-old children played a Stag Hunt coordination game in which they needed to decide whether to cooperate or play individually. During the decision-making phase, children's partner made either ostensive, communicative eye contact or looked non-communicatively at them. In Study 1 we found that communicative looks produced an expectation of collaboration in children. In Study 2 we found that children normatively protested when their partner did not cooperate, thus showing an understanding of the communicative looks as a commitment to cooperate. This is the first experimental evidence, in adults or children, that in the right context, communicative, but not non-communicative, looks can signal a commitment.

'Tigers have stripes' doesn't mean 'A tiger has stripes'. How our conceptual knowledge is organized by linguistic principles

Kim Fuellenbach (kim.fuellenbach@ling-phil.ox.ac.uk), University of Oxford, UK

Both linguists and psychologists research how we communicate conceptual knowledge. While children categorize members of a kind from a young age, we still try to understand the underlying mechanisms that enable us to carry out generalizations. Linguistics mainly focuses on the complex semantics of generics & variable truth-conditions (100%, The triangle is three-sided, to <1% Mosquitoes carry the West Nile Virus). By contrast, psychology typically focuses on comparing generic statements, argued to be the cognitive default due to easy and early acquisition, with quantified ones, which are acquired later, arguably due to their compositional set-up, corresponding to their overt structure. We investigate often-overlooked differences between two types of English generic subjects: indefinite singular (IS) and bare plural (BP). The BP is most commonly used and allows all types of subject-property relationships (e.g. principled/definitional: Tigers are striped, accidental/statistical: Barns are red), unlike the IS (*A mosquito carries the West Nile virus, *A barn is red). We explored whether linguistic cues for novel animal categories enable us to expect these differences between principled and statistical connections. Our experiments found a strong essentialist link for BPs (based on Gelman et al., 2010), explainable as BP subjects allow for both principled connections and statistical inferences, which are based on averaging over individuals. We expect IS subjects to lead participants to have even stronger essentialist beliefs (results to come, due to illness not all participants have been run yet): Since IS subjects refer to individuals, their semantics require that (generally) each individual possess the property.
Enhancing children's theory of mind: do conversations play a role?
Serena Lecce (slecce@unipv.it), & Federica Bianco, University of Pavia, Italy

Recent studies have shown that it is possible to enhance children's theory of mind (ToM) in primary school through a conversation-based training program (Bianco & Lecce, 2016; Bianco et al., 2015; Lecce et al., 2014). Despite interesting, these studies were designed in such a way that it was not possible to disentangle the role played by taking part in mental-state conversations from that of practicing with ToM material. To tease apart the contribution of these two factors (mental-state conversations vs. mental-state material), we conducted a training study in which Year 4 children were randomly assigned to one of 4 conditions: ToM material plus conversation (N = 32), ToM material no conversation (N = 31), Control material plus conversation (N = 28) and Control material no conversation (N = 31). The training consisted of 4 group sessions; in the ToM group the conversations were about mental-states related to the ToM material; in the control group the conversations were about physical events related to the control material. In testing the effect of these conditions, we controlled for verbal ability, socio-economic status, and working memory. Results showed that children in two ToM groups outperformed those in the control groups on ToM at post-test. Crucially, the ToM material plus conversation group showed greater improvements over the training period than the ToM material no conversation group. Our findings fit with data on observational studies on younger children and demonstrated the specific causal role of mental-state conversations for shaping children’s ToM in middle childhood.

Session 2

Charting the development of emotion language and emotion representations from childhood to adulthood
Erik C. Nook (enook@g.harvard.edu), & Leah H. Somerville, Harvard University, USA

At all ages, communicating about our emotions using words is a fundamental part of social relationships. Indeed, whether they’re talking to children, friends, romantic partners, or therapists, people frequently ask each other, ‘how do you feel about that?’ However, the emotion words that people comprehend and the concepts underlying these words are not static across development, posing interesting challenges for emotion communication at different stages of development. In this talk, I will present results from a series of behavioral tasks administered to 203 participants aged 4-25 that aimed to chart the development of emotion language, emotion concept representations, and emotion experiences. Three key results will be discussed. First, emotion word
comprehension (i.e., knowing the meaning of emotion words) emerges in childhood and plateaus around age 11. Second, the concepts underlying emotion words become more abstract (i.e., more attuned to general principles that define emotions rather than concrete situations that produce emotions) through adolescence and plateau later, around age 18. Third, compared to childhood and adulthood, adolescence is a period in which the ability to specifically identify (or differentiate) one’s emotions is low. These findings suggest that unique challenges in emotion communication arise at different developmental periods: Whereas children may struggle to know the words they need to articulate how they feel, adolescents may comprehend emotion words but struggle to clearly communicate them due to ongoing emotion concept development.

Irony processing in Adolescents: an ERP study
Irene Symeonidou (i.symeonidou@ucl.ac.uk), Iroise Dumontheil, Wing Yee Chow, & Richard Breheny, University College London, UK

Irony comprehension requires complex inferences about a speaker’s mind. Behavioural data indicate that while children aged 6-10 years old begin to show some appreciation of the communicative intent in an ironic remark, full appreciation of speaker attitude might be developing beyond middle childhood and into adolescence. Additionally, recent findings suggest that the online use of Theory of Mind (ToM) shows a prolonged development through late childhood and adolescence. In the current experiment, we investigated how adolescents’ (11-18 y. o.) brains process irony in real time compared to adults (24-34 y.o.). We also investigated whether the ability to understand irony is modulated by individual differences in empathy skills. Results showed that irony elicited an increased positivity (a P600 effect) in both age groups. However, the positivity was right-lateralised in adults, while it was broadly distributed in adolescents. Moreover, in adults, a significant positive correlation was found between empathy and the size of the P600 effect, indicating that irony elicited a larger P600 effect in adults with a higher empathy score. No correlation was found in adolescents. The topographic and empathy association differences between the groups suggest that adolescents are not processing irony in the same way as adults. We suggest that the topographic difference might be due to structural changes that are occurring in the brain during adolescence and propose that the age-related differences in correlation with empathy might be due to ongoing development in affective/cognitive integration abilities during adolescence.
Social Cognition in Adolescence: using eye-tracking to study belief- 
attribution abilities
Elisabeth Bradford (e.e.bradford@kent.ac.uk), Victoria Brunsdon, & Heather 
Ferguson, University of Kent

A core aspect of daily life involves considering what other people do/do not know in order to engage in successful communication. This study explored how efficiently belief-states of ‘Self’ and ‘Other’ could be computed, using behavioural and eye-tracking measures. Adolescents and young adults (aged 10-25 years) completed a computerised false-belief task in which they were shown a container with expected (e.g., sugar in a sugar jar) or unexpected (e.g., marbles in a sugar jar) contents inside. Following contents revelation, participants heard an audio question asking them to consider what either they themselves (‘Self’) or another person (‘Other’) had believed to be within the container, before seeing inside. Three images then appeared on the screen: the correct answer (‘sugar’), a distracter (‘marbles’), and a novel filler item. Results showed that participants were faster to correctly respond in ‘Self’-oriented trials versus ‘Other’-oriented trials, and that trials requiring participants to switch between the ‘Self’ and ‘Other’ perspectives were significantly slower than trials that did not require a perspective shift. Eye-tracking analysis revealed that participants took longer to disengage from the ‘distracter’ object (i.e., the object they know to actually be held in the container) in order to focus on the correct belief-state object, in trials referring to the ‘Other’ compared to the ‘Self’. Results indicate that across adolescence, and into adulthood, individuals process scenarios from an egocentric perspective, suggesting use of the self-perspective as a ‘stem’ for understanding the ‘other’-perspective.

Compensation: A candidate mechanism for explaining how autistic people can show good social skills despite poor theory of mind
Lucy Anne Livingston (lucy.livingston@kcl.ac.uk), Emma Colvert, Punit Shah, 
Patrick Bolton, & Francesca Happé, Social, Genetic, and Developmental Psychiatry 
Centre, Institute of Psychiatry, Psychology and Neuroscience, King's College 
London, UK

Autism Spectrum Disorder (ASD) is heterogenous in many ways, including developmental trajectory. Whilst many autistic people continue to demonstrate substantial social difficulties across the lifespan, a subset of autistic people show improved social skills. It is currently unclear whether these improvements in social skills are necessarily underpinned by improvements in underlying social cognition (e.g., Theory of Mind; ToM). One potential mechanism is compensation, which proposes that some autistic people can compensate for their underlying difficulties (e.g., in ToM), thus demonstrating relatively few behavioural symptoms,
despite continue core cognitive deficits (Livingston & Happé, 2017, NBBR). For example, autistic people may use alternative cognitive routes, independent of ToM, to navigate everyday social situations successfully, despite continuing to perform atypically on ToM tasks. I will outline the compensation framework and its relevance to understanding ASD across the lifespan in both research and clinical settings. I will present data from 136 autistic adolescents suggesting that the tendency to compensate for poor ToM, and show good social skills in behaviour, is associated with better domain-general cognitive abilities (IQ, executive function) but also greater anxiety (Livingston et al., 2018, JCPP). I will also discuss how future research into compensation in ASD requires more sensitive cognitive tasks (e.g., improved ToM tasks) that are resistant to learned compensatory strategies.
Thursday 28th June

Session 3

**Individual differences in children's pragmatic ability: a review of associations with formal language, social cognition and executive functions**
Danielle Matthews (danielle.matthews@sheffield.ac.uk), Kirsten Abbot-Smith, & Hannah Biney, University of Sheffield, UK

Children vary in their ability to use language in social contexts and this has important consequences for wellbeing. We review over 50 studies that tested whether individual differences in pragmatic skill are associated with formal language ability, mentalising and executive functions in both typical and atypical development. The strongest and most consistent associations found were between pragmatic and formal language. Additional associations with mentalising were observed, particularly with discourse contingency and irony understanding. Fewer studies considered executive function and evidence is mixed. To make progress, high-quality studies of specific pragmatic skills are needed to test mechanistic models of development. We propose 6 goals for future research: 1) developing an empirically-based taxonomy of pragmatic skills; 2) establishing which skills matter most for everyday functioning; 3) testing specific hypotheses about information processing; 4) augmenting measures of individual differences; 5) considering a broader set of psychological associates; 6) employing statistical tools that model the nested structure of pragmatics and cognition.

**Self-conscious emotion processing in adolescents with ASD: Over-reliance on learned social rules may serve as compensatory strategy for less spontaneous mentalizing**
Kathryn F. Jankowski (kathrynj@uoregon.edu), & Jennifer H. Pfeifer, University of Oregon, USA

Research suggests youths with ASD experience a secondary wave of social cognitive impairments during adolescence, which impact peer relationships. Investigating self-conscious emotion (SCE) understanding may shed light onto real-world interpersonal challenges. We investigated the subjective experience and neural correlates of SCE processing in ASD and neurotypical adolescents (ASD=27, NT=25). During an MRI scan, participants watched videos of peers in a singing competition. Videos manipulated emotion type (embarrassment, pride) and perspective-taking (PT) demands (low, high). During low PT, singers emotions matched their singing quality (sing well, act proud); during high PT, they did not (sing poorly, act proud). Participants rated how embarrassed and proud singers felt. Congruent ratings matched singers conveyed emotions (i.e., they rated how
embarrassed an embarrassed singer felt); incongruent ratings did not (i.e., they rated how proud an embarrassed singer felt). Repeated measures ANOVAs assessed group differences in SCE attributions and neural patterns. Groups made similarly intense congruent SCE ratings. However, ASD adolescents made more intense incongruent SCE ratings during high PT (i.e., they rated embarrassed singers who sang well as prouder). These atypical emotion attributions correlated with greater perspective-taking challenges and more severe autistic traits. These findings suggest that ASD adolescents can recognize SCEs, but emotion attributions may be more strongly influenced by the situational context, based on learned social rules. Furthermore, although ASD adolescents broadly recruited similar neural patterns during SCE processing, atypicalities within social cognition and salience regions may reflect an over-reliance on abstract rule-following, possibly serving as a compensatory strategy for less spontaneous mentalizing.

**Cognitive and Affective Theory of Mind in children and adolescents with and without ASD**

Elisa Back (e.back@kingston.ac.uk), Hannah Cotmore, Jessica Dalebout-Campbell, Marjan Darabi-Hammond, Jessica Ganter, & Annette Williams, Kingston University London, UK

One explanation for the social communication difficulties experienced by individuals with Autism Spectrum Disorder (ASD) is a deficit in Theory of Mind (ToM). However, there are mixed findings with respect to their recognition, understanding, and expression of mental states and emotions. The aim of this study was to compare the profile of abilities in individuals with and without ASD in areas related to cognitive and affective ToM. Twenty children and adolescents with ASD were matched to 20 typically developing (TD) children and adolescents (aged 7-15) on chronological age and IQ. A battery of tasks were administered that included traditional cognitive ToM tasks (first and second order false belief reasoning) and affective ToM tasks which involved inferring mental states from briefly presented facial expressions and an empathic responsiveness task which concerned responding to real-life displays of emotions. Findings suggested that the ASD group performed less well than the TD group only on the second order false belief task and inferring mental states to briefly presented facial expressions but they showed similar levels of performance on the first-order false belief task and the empathic responsiveness task. Findings will be discussed in relation to the underlying mechanisms required for cognitive and affective ToM processing in ASD and the implications for using more real-life paradigms.
**Real time language production and Theory of Mind assessment in Autism Spectrum Disorder**

Hayley Hunt (k0840946@kingston.ac.uk), Elisa Back, & Jo Van Herwegen, Kingston University, UK

Understanding and labelling emotions and mental states has often been associated with impacting understanding of social situations for people with Autism Spectrum Disorders (ASD), arguably due to difficulties in Theory of Mind (ToM) understanding. However, many studies that examine ToM abilities use tasks that have a complex language content, or use non-verbal tasks that lack ecological validity. Language difficulties have been frequently reported in ASD. Therefore, the current study used more ecologically valid methods to investigate spontaneous judgements and accurate mental state labelling, challenging participants to simultaneously interpret, code, and communicate mental states in complex scenes from the silent movie The Artist. 35 participants with ASD, diagnosis reconfirmed using ADOS 2, were matched to 34 typically developing (TD) peers, mean Chronological Age (CA) ASD 13.7, TD 13.0 age range between 7 and 18 years, also groups were matched using WASI FSIQ. Participants watched three scenes and were asked ‘Please watch the scene and say what you think is happening, paying particular attention to how the characters are thinking and feeling.’ Participants were watching and talking concurrently. Mean Length of Utterance (MLU) and language samples were coded using SALT. Results show that participants with ASD, MLU is reduced, as is the use and accuracy of mental state terms. Findings will be discussed in relation to the impact of this reduction in flexible and diverse language on ToM understanding and social communication.

**Session 4**

**Is measuring (a)typical social cognition on the web as good as the lab?**

Punit Shah (p.shah@bath.ac.uk), University of Bath, UK

The replication crisis and technological developments have spurred the development of online platforms to collect larger and richer datasets in psychological science. These developments were initiated by personality and social psychologists to administer relatively short and simple questionnaire and behavioural measures. And, more recently, psychologists interested in cognitive and perceptual processes report evidence that complex web-based experiments can be as robust as lab based tasks (e.g., Germine et al., 2012, Psychon. Bull. Rev.). In this talk, I reflect on the growth of web-based psychological research, with a focus on the promise and pitfalls of measuring social cognition on the internet. Referring to ongoing studies, I also present web-based research in clinical groups (e.g., Autism) that, despite several challenges, holds potential to inform
theoretical, methodological, and applied research on social cognitive atypicalities. Together, I will argue that the measurement of (a)typical social cognition on the web is comparable to, and potentially more important, than its measurement in the lab.

**Can synchronised action promote perspective-taking?**

Jess Wang (j.wang40@lancaster.ac.uk), & Eloise Hewston, Lancaster University, UK

As social beings, we frequently partake in collective activities in which not only do we need to perform the same action as others, it is also critical for us to act in time with others e.g., chanting and clapping at a football match. Wiltermuth and Heath (2009) suggested that acting in synchrony with others promotes cooperation and weaken the boundaries between self and other. This led us to hypothesise that acting in synchrony with others would promote consideration of others’ perspectives, due to a weakened self-other boundary. We employed a level-1 visual perspective-taking task (Samson et al., 2010), which allowed us to assess the degree to which participants spontaneously take others’ perspective. Participants clapped to the beat of a metronome, which was incidentally synchronous or asynchronous with the rhythm of a filmed actor clapping. Participants then saw the same actor in the perspective-taking task. Results showed that participants who acted in synchrony with the actor were more likely to take the actors perspective than participants who acted asynchronously with the actor. This finding supports the notion of a weakened self-other boundary following synchrony. It also highlights the link between action and mental state representation.

**Uncovering the role of premotor cortex in action understanding using transcranial magnetic stimulation**

Caroline Catmur (caroline.catmur@kcl.ac.uk), Emma L Thompson, & Geoffrey Bird, King’s College London, UK

Mirror neurons in ventral premotor cortex (PMv) have been claimed to be involved in two distinct action understanding processes: identifying actions (Pobric & Hamilton, 2006), and identifying intentions (Michael et al., 2014). Previous studies have struggled to determine the relationship between premotor cortex and these different aspects of action understanding, probably because the identification of intentions from others actions requires an initial action identification process. The current study sought to resolve this dispute by investigating the timecourse of PMv involvement in action identification and intention identification. Disruptive transcranial magnetic stimulation was administered to the PMv and a control site at varying timepoints while participants identified either the actions or intentions portrayed by hand movements. A significant interaction was found between brain
site, time of stimulation, and action understanding process, with early disruption to the PMv impairing response times for the action identification process. These data support the hypothesis that mirror neurons in ventral premotor cortex are involved in action identification, rather than in the identification of others' intentions.

"Oh yeah, thrill of thrills!" What we learn about the use of ironic comments in child-directed speech from the analysis of the Providence corpus of CHILDES

Natalia Banasik-Jemielniak (natalia.banasik@psych.uw.edu.pl), University of Warsaw, Poland

There has been little research on the figurative language in parents' input provided by caregivers in child-directed speech during the first four years of the child's life. The aim of the described study was to check how often, if at all, ironic comments are present in child-directed speech when the interaction takes place between a mother and a child as young as four. Also, once it was found that children are exposed to irony that early, the types of ironic comments used became the object of interest. In order to answer these questions, ironic utterances were identified in the videos of 50 hours of recordings that included mother-child interactions of five children aged 2;10 - 3;05, available through the CHILDES - Providence Data (Demuth et al., 2006). The extracts were then assessed by competent judges to make sure the identified instances meet the criteria for verbal irony (Dynel, 2014). Results suggest that less than 1 per cent of all mothers' interactions are ironic, with a significant number of comments where the child seems not to be the actual addressee of the message, but rather the overhearer. The number of ironic utterances used by a mother seems to be related to the number of teasing used with the child in the interactions. According to the judges, the ironic utterances identified during the interactions were mostly used by the mothers as a coping strategy through humor. They included references to the social norms, failed expectations, the child's behavior or situations that were difficult to handle.
Friday 29th June

Session 5

The role of visual attention as mechanism for interpersonal communication and behavioural coordination in social hierarchies
Matthias S Gobel (matthias.gobel@sagecenter.ucsb.edu), University of California, USA

From the playground to the boardroom, social hierarchies coordinate human interactions across lifespans. While recent research has started to investigate how visual attention is employed in social contexts, very little remains known about its role within one central social dimension of everyday life: social hierarchies. In this talk, I will address two topics of the ongoing scientific debate: First, I will discuss under what conditions people change the focus of their attention when interacting with higher and lower ranked others. Second, I will examine to what end people change the focus of their attention when interacting with higher and lower ranked others. To investigate both topics, I use an interdisciplinary experimental approach integrating social psychological, cognitive, and neuroscientific methodology. Across studies, behavioural results show that social hierarchies coordinate the allocation of visual attention in endogenous and task-dependent manner. Moreover, results from electroencephalography demonstrate that higher-order social beliefs about the social rank of an interaction partner penetrate visual attention at basic levels, modulating alpha-band oscillatory activity during early visual processing. In sum, it appears that shifting visual attention in social hierarchies, and presumably across social contexts, fulfils a dual function: It gathers information from others, and it signals information back to them. Such 'social attention', I suggest further, might be a key mechanism for the facilitation of interpersonal communication and behavioural coordination in groups, making looking at and looking with higher ranked individuals the perfect social tool. I will conclude by discussing the importance of social attention across the lifespan.

The effect of social cues on regulation of personal space in children and adults: a study using immersive VR
D. Michael Burt (d.m.burt@durham.ac.uk), Durham University, UK

Personal space, the distance at which we are comfortable approach others and being approached ourselves is thought to be affected by personal factors such as social anxiety and autistic traits as well as social cues of the person who is being interacted with. Immersive Virtual Reality was used to provide engaging but simple social interactions in which facial expressions and gaze were realistic but highly controlled. The effects of these social cues on the distance which adults and
children are comfortable to approach and be approached were investigated. Data from studies demonstrating the effects of gaze and expression will be presented showing the similarities between social cue usage in 6-13-year-old children and adults covering both typical individuals and individuals with a degree of social anxiety.

**Empathy draws on autobiographical memories**

Federica Meconi (f.meconi.1@bham.ac.uk), Ian Apperly, & Simon Hanslmayr, University of Birmingham, UK

Empathy relies on the ability to mirror and to explicitly infer others’ inner states. Accumulating evidence supports the idea that our memories interact with empathy when building a representation of others’ inner states. However, direct evidence of a reactivation of autobiographical memories when it comes to empathizing with others’ inner states is yet to be shown. We collected electroencephalographic activity from 28 participants while performing an empathy (i.e., the pain decision task) and a retrieval task. For each trial, participants viewed pictures of faces and were required to imagine that individual in a context described by a written sentence representing either non-autobiographical or autobiographical experiences of painful and neutral events. Participants judged how much empathy they felt for each individual depicted in the specified context. The success of these manipulations was confirmed by participants higher self-reported empathy for faces depicted in autobiographical compared to non-autobiographical contexts. In the retrieval task participants were cued to imagine the painful and neutral contexts in their mind’s eye, and these data became the training set for a pattern classifier, which was then applied to data from the empathy task to test for evidence that the same memories were activated. The results showed evidence for the reactivation of autobiographical memories in preparation for the empathy judgement independent of the emotional content of the memory. These findings demonstrate that autobiographical memories are involved in drawing our empathy.
Session 6

Visual perspective taking in young and older adults
Andrew Martin (a.martin11@uq.edu.au), & Marcus Meinzer, The University of Queensland, Australia

Advanced age is associated with difficulties in social understanding. However, little is known about the underlying cognitive processes. Using a novel visual perspective taking (VPT) task, 50 healthy older adults and 122 healthy young adults completed measures of implicit and explicit VPT. Association with executive and social cognition were assessed. Older adults were slower when required to take the allocentric perspective in explicit VPT. Congruency effects (impaired performance when scenes were incongruent with the alternate perspective) were identified for accuracy and RT for the egocentric and allocentric conditions of both level one and two explicit VPT. Older adults displayed a greater congruency effect during egocentric trials of the level two VPT task. Congruency effect for errors on the allocentric condition of both level one and two VPT tasks correlated with social emotional cognition, with greater ability to inhibit the egocentric perspective associated with better social cognitive performance. Switching to the allocentric perspective was associated with processing speed and these partially, but not completely, explained the age-related effects on switch cost. A robust implicit VPT effect was identified in both young and older adults. Social difficulties may arise in older adults due to difficulty switching to the allocentric perspective. A greater tendency to rotate into allocentric perspectives during egocentric judgements may reflect a weaker embodied self in older adults. Executive and social cognition are associated with perspective taking ability, but these only partially explain age-related performance differences. Perspective taking difficulty should be considered in studies of social difficulties in advanced age.

The ageing mirror system and its relationship to social cognition
Victoria Brunsdon (v.e.a.brunsdon@kent.ac.uk), Elisabeth Bradford, & Heather Ferguson, University of Kent

This study explored the functioning of the human mirror neuron system (hMNS) across the lifespan and investigated how the hMNS is related to social cognition. Over three hundred participants aged 10- to 86-years-old completed an action observation task, and mu/alpha (8-13Hz) and beta (13-35Hz) desynchronisation were used as an EEG marker of the hMNS across the sensorimotor cortex. Results revealed enhanced mu and beta desynchronisation across the sensorimotor cortex during hand action observation compared to static hand observation at all ages, in support of the mirror neuron hypothesis. More importantly, this action-static difference in mu and beta desynchronisation was greater for younger adults.
compared to adolescents, suggesting that the hMNS is still maturing during adolescence, and greater for middle-aged and older adults compared to younger adults. This pattern was further verified using age as a continuous variable, showing a greater percentage change in both mu and beta power to action observation over the central electrodes with increasing age, thus indicating that hMNS activity increases throughout the lifespan. In addition, mu desynchronisation, and hence hMNS activity, was related to social cognitive abilities. The results suggest that the hMNS continues to specialise for social cognition with advancing age.

**Social cognition in aging: can motivation explain age-related differences?**

Irene Ceccato (irene.ceccato01@universitadipavia.it), Serena Lecce, Elena Cavallini, & Ted Ruffman, University of Pavia, Italy

A growing body of literature shows an age-related decline in socio-cognitive abilities. Interestingly, some recent studies have suggested that this decline may be due to older adults’ reduced motivation in engaging on cognitive activities that are experienced as not personally relevant or that are not in line with socio-emotional goals. To investigate this possibility, in our study we experimentally manipulated motivation -specifically, self-involvement- and analysed its effects on socio-cognitive performances of young and older participants. We considered two facets of social cognition, namely theory of mind (ToM) and emotion recognition (ER). Crucially, motivation was measured with both subjective and objective indices, namely self-report questionnaire and systolic blood pressure reactivity during tasks accomplishment. Sixty-one older and 57 young adults were randomly assigned to either a High or a Low Motivation condition. Self-involvement was raised in the High Motivation condition by telling participants that good task performance was associated with a number of positive, personally relevant social outcomes. Results indicated that: 1) the self-involvement manipulation did not increase motivation in both age groups; 2) older adults were more motivated than young participants; 3) nevertheless, young adults outperformed older participants in both socio-cognitive tasks; and 4) individual differences in motivation were not related to individual differences in socio-cognitive performances. Globally, our results suggest that the age-related decline in ToM and ER is not simply a matter of lack of motivation in tasks accomplishment.

**Prosocial behavior in aging: which factors explain age-related differences in a social-economic decision making?**

Alessia Rosi (alessia.rosi@ateneopv.it), Marta Nola, Elena Cavallini, & Serena Lecce, University of Pavia, Italy
Prosociality is the ability to act beyond one's self-interest to benefit other people. One common paradigm used for studying propensity to prosociality is the Dictator Game, a social-economic decision-making task in which participants propose divisions of money between themselves and a social partner. Previous studies suggested that people are more altruistic and prosocial if they have some information about the social partners characteristics. However, little research focused on the age-related differences in the Dictator Game and on understanding which factors may explain such differences. Considering these research gaps, we first examined to what degree the content of social information about the social partner may have a different impact on young and older adults in the Dictator Game. For these reasons, 48 younger (Age M= 23.29; SD = 2.20) and 48 older adults (Age M= 70.19; SD = 5.13) played the Dictator Game in the role of dictator in which social information about the partner was manipulated with four levels of description: no information, physical description, positive and negative psychological descriptions. We then investigated which variables may explain any age differences in the propensity of prosocial behavior shown in the Dictator Game, focusing on reasoning, Theory of Mind, and empathic concern. Results showed that older adults are more prosocial than younger adults, particularly when the social partner is described with positive psychological and physical features. The older adults' more prosocial behavior is explained by the reduction in reasoning ability, and not by Theory of Mind or empathic concern.
Poster Abstracts

1. **Face-scanning embedded in social interaction: evidence from a gaze-contingency paradigm**
   Jolie Keemink ([jrk26@kent.ac.uk](mailto:jrk26@kent.ac.uk)), Maryam J. Keshavarzi-Pour, & David J. Kelly, *University of Kent*

   Background: Face-scanning is an important skill that takes place in a highly interactive context embedded within social interaction. However, previous research has taken face-scanning out of its social context and reduced it to an isolated behavior by using passive stimuli. We aimed to study face-scanning and social interaction in infancy in a more ecologically valid way by providing infants with a naturalistic and socially engaging experience.

   Methods: We developed a novel gaze-contingency eye-tracking paradigm in which infants could interact with face-stimuli. Responses (social/non-social) from faces were contingent on infants eye movements. We collected eye-tracking and behavioral data of 143 (66 male, 77 female) typically developing 6-, 9- and 12-month-olds.

   Results: All infants showed a clear eye preference. Contingency was learned implicitly and infants were more likely to show behavioral responses when receiving social responses compared to receiving non-social responses. Infants' responses were also more often congruent with the actors responses than incongruent. Additionally, our large sample allowed us to look at the distribution of behavior on our task and we identified a small number of infants who displayed deviant behaviors. We discuss these findings in relation to data collected from a small sample of infants considered to be at-risk for autism spectrum disorders.

   Conclusions: Our results demonstrate the versatility of the gaze-contingency eye-tracking paradigm, allowing for a more nuanced and complex investigation of face scanning as it happens in real-life interaction. More importantly, our socially demanding task holds the potential to identify atypical neurodevelopment within the first year of life.

2. **Cultural differences in dyadic interaction using head-mounted cameras**
   Prerna Aneja ([p.anuja@uea.ac.uk](mailto:p.anuja@uea.ac.uk)), & John Spencer, *University of East Anglia*

   Research in western societies show that shared attention between infant and caregiver underscores the development of language and supports social interaction. However, due to differences in socialisation, children’s attention strategies vary across cultures. Parents in Western countries adopt a pedagogical perspective of teaching and shaping children's learning, while in non-western traditional societies children are responsible for gathering knowledge. Here, we use head-mounted cameras to examine how attention is distributed in dyadic
interactions in India compared to the UK. We recorded a ten-minute naturalistic toy-play session with 60 mother-infant dyads (six-month-olds) in India and UK. For preliminary analyses (N=10), we coded infant’s and mother’s total looking time at the face of the partner, at toys, and at their own or the partners hands while manipulating objects. Overall, infants spent the most time looking at toys. Faces also captured attention; Indian infants and mothers spent more time looking at faces than British infants and mothers. Indeed, British infants spent more time looking at toys in their own hand than at their mom’s face. Most dramatically, there was an asymmetry in who was holding the toy. Indian infants spent more time looking at the toy in mom’s hand than in their own because moms tended to hold the toy more frequently, while British infants spent more time looking at the toy in their own hand than in mom’s because moms tended to hand the toy over, reflecting cultural differences in parent expectations regarding the role of each actor in the dyad.

3. Probing the neural and behavioral mechanisms of spatial coordination during interactive word learning in early development
Sara Mosteller (s.mosteller@uea.ac.uk), Larissa K. Samuelson, Sobanawartiny Wijeakumar, & John P. Spencer, University of East Anglia

Samuelson, Smith, Perry and Spencer (2011) found that individual differences in spatial coordination as parents taught their 17-22 month old children the names of 2 novel objects was uniquely correlated with children's performance on a later comprehension test. We are exploring individual differences in how shared space shapes social interaction and word learning early in development. We are currently measuring coordinated brain activity in Samuelson et al.’s task using simultaneous fNIRS in pairs of preschool-aged children and their parents, and pairs of adult friends as a reference group. Children and parents are seated across from one another at a table. The parent teaches the child the names of 3 novel objects. An experimenter then tests the child by presenting the objects in pairs on a tray and asking the child the retrieve one object by name. This procedure is then repeated with 5 novel objects. In addition, we are gathering eye-tracking data to establish moments of joint attention and also to collect a measure of social coordination during the task. A preliminary analysis of the comprehension test in a sample of 10 participants, showed that children learned an average of 50% of 6 mappings. Ongoing analyses are examining the consistency with which the parent kept each object either to the right or the left of the child during the parent-child interactions with 8 possible mappings. We predict that greater spatial consistency in where the objects are located during the training will be positively correlated with the number of words learned. Further, we hypothesize that spatial consistency during the session will be positively correlated with synchronized
4. The processing of emotional facial expressions in infancy

Jonathan E Prunty (J.E.Prunty@kent.ac.uk), & David J Kelly, University of Kent

Facial expressions are highly salient social signals, and, especially in preverbal infants, form an important part of communicative interactions. Despite the fact that there has been considerable interest in the development of emotional expression processing for some time (Darwin, 1872; Ekman et al., 1972), it is still not particularly well understood (see Quinn et al., 2011 for a review). Furthermore, certain expressions (e.g. fear) have received substantial attention in the literature, whilst others (e.g. disgust) have not (Ruba et al., 2017), and to our knowledge no infant study on face expression has included all six of the basic emotions (Ekman, 1987). In this current study, we investigate the fundamental question of how infants process emotional facial expressions. We have developed a novel eye-tracking (Eyelink 1000+) paradigm that simulates social interactions by combining dynamic stimuli and gaze contingency. Infants are therefore able to trigger video responses from the on-screen actor by engaging them in eye contact. To date, we have collected data for over 100 six-, nine- and twelve-month-old infants with the aim of establishing the normative perceptual strategies infants use for processing the six basic emotional expressions, and how these develop. We have developed new methods to analyse dynamic stimuli such as video heat maps and interest areas that adapt to the changing size and position of face regions. Preliminary analyses show infants, like adults (Smith et al., 2005), use distinct strategies in processing each emotional facial expression, with diagnostic features attracting the most attention.

5. Identification of Social Looking behaviours in Infancy

Silvia Panella Peral (spanella@my.shu.ac.uk), Luke Beardon, & Tim Jay, Sheffield Hallam University

Social looking is an integral part of any infants affective and social development. Looking at faces forms the first elements of social interaction and reciprocity that evolves into more complex developmental dimensions (Clyman et al., 1986). One of the most well-known social looks is Social Referencing, which allows infants to gain an understanding of the world by a means of seeking and gathering emotional information (Feinman, 1990). This paradigm, which has been studied extensively through laboratory and semi-naturalistic experiments, constitutes only one type of social looking behaviour. Little is known about what other types of social looks infants display during natural interactions with significant adults. Additionally, there is no research that have explored how the different types of
social looking behaviours may have a different presentation in neurological conditions such as autism. This paper tries to answer these questions by identifying and conceptualising the different types of social looking behaviour infants display during natural occurring interactions with adults. Using observational data, I will present and discuss a nomenclature of the types of social looks as well as data showing how patterns of social looking behaviour may be different in infants at risk of having autism. This research provides new insights in understanding the different types of social looks as well as how social looking patterns help infants make sense of the world around them.

6. Cognitive underpinnings of irony understanding in children

Maria Zajaczkowska (mkz2@kent.ac.uk), Kirsten Abbot-Smith, & David Williams, University of Kent

We examined the relationship between irony interpretation and Theory of Mind measures (Strange Stories, Happé, 1994) and the Theory of Mind Inventory (ToMI, Hutchins et al., 2012), as well as working memory, set shifting and inhibitory control, whilst controlling for non-verbal IQ. We also examined different types of irony interpretation. All previous studies have used simple forms of irony, where the hearer can see from the real world context that the literal meaning cannot be true (see (1)). We included a complex irony condition, where the non-literal interpretation cannot be inferred from the visual context (see (2)).

(1) Tom and Sally wanted to go for a picnic. It has just started to rain. Sally: It’s a perfect day for a picnic.

(2) Tom: I have been invited to a party by the most beautiful girl in my class.
    Sally: Yeah, and I have been invited to the Queen’s party.

We presented children (N=51; aged 6;01 - 9;01) with 5 videos, in both simple and complex irony conditions. After each short dialogue as in (1) and (2), participants answered an open-ended question, then a forced-choice (out of three) question about the speakers meaning. Children selected above chance for simple irony (M = 76% correct) but significantly below chance for complex (M = 25% correct) irony. Regression analyses showed that when controlling for age, nonverbal IQ and formal language, ToM measures related to simple irony interpretation. There was no relationship found between the EF and ToM measures and complex irony interpretation.
7. **Partner specificity and representational flexibility in children**  
   Nera Bozin ([nb468@kent.ac.uk](mailto:nb468@kent.ac.uk)), Mafalda Costa, & Erika Nurmsoo, *University of Kent*

Children expect conversational partners to use consistent expressions, referential pacts. Three year olds already show sensitivity to referential pacts (Matthews, Lieven, & Tomasello, 2010). They show a slower response when the original partner uses a new expression to refer to a target compared to a previously established expression. This difference is not seen when communicating with a new partner. It is not clear whether this expectation is specific to language, or whether children extend it to other referential cases, such as in drawing. We investigated three- to five-year-old childrens referential expectations of drawings compared to linguistic expressions. One experimenter established the initial meaning, by clearly drawing the target (e.g., a circle as a ball; Drawing condition), or by referring to the target using ambiguous language (e.g., 'the round one'; Language condition). Either the same experimenter or a new experimenter used the same expression (e.g., 'the round one' or the drawing) to request the original object as compared to a new, similarly shaped object (e.g., a plate). We report children’s reaction times and error rates to determine whether children show partner specificity in interpreting the referent of ambiguous drawings, as has been found in language. The results are discussed with reference to the literature on referential pacts, as well as on childrens understanding of the referential intent of drawings.

8. **Previously shared information impacts performance in the change of location false-belief task**  
   Gideon Salter ([gs213@st-andrews.ac.uk](mailto:gs213@st-andrews.ac.uk)), & Richard Breheny, *University of St Andrews*

This paper addresses the factors affecting performance on explicit false-belief tasks. Our proposal builds on the idea that mention of the target object creates unwanted attention on the object in the reality location [1-2]. We propose that mention of the target object typically brings attention to the reality location via memory-based processes that are biased to retrieve previous *shared* information. We build on psycholinguistic research showing that information from previous shared interactions with an interlocutor becomes highly salient when cued at subsequent interactions [3-4, 5]. Our study is based on [1], experiment 2b. We manipulate whether the child shares the reality location with the experimenter who asks 'Where will the elephant look for the banana?' For the experimental group (Age: 3.0-4.17; M = 3.61) we switch in a second experimenter after the object is moved. The control group (Age: 3.0-4.25; M = 3.66) procedure is as in experiment 2b in [1]. Participants also undertook a 'bear/dragon' IC task. In the
control group, 6/19 children (32%) passed, similar to rates in [1]/expt. 2b. In the experimental group, 12/19 (63%) passed. A logistic regression analysis with condition, IC score and age as predictors revealed that only condition significantly predicted performance (p = 0.043). Thus target mention impacts performance significantly more when the reality location is shared.


9. Dynamics of single word production from childhood to adolescence and adulthood
Tanja Atanasova (tanja.atanasa@unige.ch), Raphaël Fargier, Pascal Zesiger, & Marina Laganaro, University of Geneva

Changes in mental processes involved in word production and their time-course are likely to occur across the lifespan. Previous studies have shown functional and temporal differences in speech planning processes among school-age children and adults in picture-naming tasks (Laganaro et al., 2015). More specifically, different neural networks appear to be recruited in the time window associated to lexical-semantic encoding between 10- to 12-year-old children and young adults. Our aim is to use EEG/ERP activities to investigate when and how the youngsters develop an adult-like activation in word production. We expect adolescents to either show more adult-like activities when younger children show the involvement of different neural networks as compared to adults, or to still constitute a transitional age group between children and adults. In order to test our predictions, we performed an EEG/ERP picture-naming experiment with participants from three different age groups: 10-12, 16-18 and 20-30 years. Waveform analysis and topographic pattern analysis revealed significant between-group differences throughout the entire period, especially in key-time windows on stimulus-aligned ERPs, both early - associated with pre-linguistic processes, and late - associated with lexical processes. Microstates analyses indicate clear topographic differences between children and adults and evolution occurring during adolescence.

10. Ratings of trustworthiness from adult voices is consistent whether rated by children or by adults
Gaby Mahrholz (g.mahrholz.1@research.gla.ac.uk), Hannah Greenwood, Benedict Jones, & Phil McAleer, University of Glasgow

Estimating the trustworthiness of another is an important ability that helps sustain our wellbeing through identifying other's intentions, avoiding threats, and
establishing appropriate relationships. Previous research has shown that, as adults, our judgement of trustworthiness changes as we age, with older adults perceiving more trust in others than younger adults, potentially due to a desire for social inclusion and avoiding isolation (Castle et al., 2012). However, little is known about the initial development of how we perceive trustworthiness in others and whether or not it modulates from childhood into young adulthood. Focussing on perceived trustworthiness from voices, this study explored whether there were significant relationships between ratings of trustworthiness given by participants from three stages of early development: total N = 183; children: 5-10 years old (N = 59); adolescents: 11-19 years old (N = 65); young adults: 20-29 years old (N = 59). Listeners rated on a scale from ‘very untrustworthy’, to ‘very trustworthy’, the perceived trustworthiness of 15 male and 15 female, young adult, speakers saying ‘Hello’. A one-way ANOVA revealed no significant group differences in average trustworthiness ratings and all correlations between groups showed strong, positive relationships (all r’s > .8). However, linear mixed effects modelling indicated a small but significant increase of perceived trustworthiness with listener age. Overall, the findings align with those from other modalities suggesting that our gauge of trustworthiness is established in childhood, remaining relatively stable until early adulthood, but with small modulation perhaps driven by the experience our own social relationships.


Irene Symeonidou (i.symeonidou@ucl.ac.uk), Heather Ferguson, & Richard Breheny, University College London

A number of studies have provided evidence for structural and functional changes in the brain areas involved in theory of mind (ToM) (the ‘social brain’) not only during childhood, but also during adolescence. Recent findings also suggest that the online use of ToM shows a prolonged development into adolescence. In order to investigate further ToM development, we adopted a visual world paradigm to examine how quickly older children (N=17, age 9-13) and adolescents (N= 18, age 14-18.5) can use knowledge about a character’s preferences (e.g. ‘Helen dislikes vegetables’) and higher-order desires (e.g. ‘she wishes to keep this preference secret/open’) to make ToM inferences and predict that character’s subsequent behaviour during discourse, in comparison to adults (N=17, age 25-36). The target sentence described an action performed by the character consistent with his/her preferences (e.g. ‘When Helen goes to dinner parties she makes a show of eating vegetables/meat’). Results showed that adults start making anticipatory eye movements towards the image (vegetables/meat) consistent with the character’s desires from the ambiguous noun (‘dinner parties’). In contrast, children and adolescents only showed successful anticipatory use of ToM upon hearing the
verb ('eating'). These results suggest that older children and adolescents may not be able to use information about others’ mental states as quickly as adults. Individual differences in participants' working memory, inhibition and empathy were also measured to examine their role in the development of higher order ToM processing.

12. **Recognising microexpressions of mental states across the lifespan.**
Rashma Hirani (k1463235@kingston.ac.uk), & Elisa Back, Kingston University

Research into the recognition of facial expressions is fundamental to understanding why this ability differs amongst individuals. This study aimed to investigate whether microexpressions of mental states can be recognised amongst children, adolescents and adults. Studying the development of this ability was also of interest to researchers. This study also examined whether accuracy rates of correct identification differed across these three groups. The presentation of mental states (such as worried) as a microexpression is a novel addition to previous research and this is the first time that microexpressions detection has been investigated in children and adolescents. Participants consisted of 40 adults (aged 19-64), 40 adolescents (aged 13-16) and 40 children (aged 8-12). Video clips of eight microexpressions (200ms) were presented four times and participants were asked to identify the mental state from four options. Findings suggest that all three groups were able to correctly identify these mental states when presented as microexpressions. Furthermore, accuracy rates differed depending on the microexpression presented. Adults recognised microexpressions significantly better than children and adolescents recognised microexpressions significantly better than children. Implications of this research include highlighting the developmental differences between adults and children in their ability to recognize microexpressions of mental states. Future research aims to track the development of this ability in atypically developing groups.

13. **The effect of age and autism traits on Theory of Mind performance across the adult lifespan.**
Gavin R. Stewart (gavin.stewart@kcl.ac.uk), Martha Cottam, & Rebecca A. Charlton, King’s College London / Goldsmiths, University of London

There are known associations between theory of mind (ToM) ability and presence of autism traits among young adults with and without autism. However, this has seldom been examined across the lifespan despite known reductions in ToM ability in ageing. In this study, 96 typical adults (49 aged 18-46; 47 aged 60-91) completed the Strange Stories Film Task (SSFT) to measure ToM and the Broad Autism Phenotype Questionnaire (BAPQ) to measure presence of autism traits. The SSFT reflects real-world scenarios and produces three scales related to ToM
performance (Intention, Interaction, Mental State speech) and one memory scale. Individuals were divided based on age (Old-v-Young), and as meeting the clinical cut-off on the BAPQ (High-v-Low Autism Traits). A 2x2 ANOVA examined the effects of age and autism traits. Results show a main effect of autism traits on all three SSFT-ToM scales with those low in autism traits demonstrating better performance; no significant age-effects or interactions were observed. For the memory scale, both autism trait and age effects were observed (Low autism traits better than High; Young better than Old) but the interaction did not reach significance. Results suggest that presence of autism traits increases difficulties in ToM performance and could confer additional risk to social understanding across the lifespan. However using a ToM test designed to reflect real-world scenarios, common age-effects were not observed, suggesting age-decrements in ToM may be exacerbated by task characteristics. Future studies should examine whether tests designed to reflect real-world scenarios are associated with behaviour in the real-world.

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Background: Social Anxiety (SA) is elevated in Autism Spectrum Disorder (ASD), a neurodevelopmental condition characterised by social and communication (SC) difficulties. Despite the high prevalence of SA in ASD, research exploring the cognitive mechanisms underpinning SA is limited. Recent research has proposed that individuals with ASD who show an enhanced awareness of their own SC difficulties, termed social insight, may be at an increased risk of developing SA. To date, no research has explored the relationship between social insight and SA. In the present study, we developed a novel dynamic video-based experimental task to measure social insight and explored the relationship between social insight, SA and social-autistic traits.

Methods: We used a mixed experimental design using both cognitive tasks (IQ, social insight) and questionnaires (SA, autistic traits, depression, anxiety). A sample of 57 typically developing adults completed questionnaire, accuracy and metacognitive measures.

Results: Our analysis revealed that autistic traits and SA symptoms are not related to social cue recognition. In addition, we found that individuals with higher SA symptoms and autistic traits showed a lack of positive bias and greater negative bias in social cue recognition. Furthermore, we found no association between an individual’s level of social insight and SA symptoms or autistic traits using our novel task.
Conclusions: The present research may have important implications for understanding the cognitive mechanisms associated with SA and inform the adaptation of interventions used to treat SA symptoms in individuals with ASD, who often experience increased insight into their own SC difficulties.

15. ‘Listening in your shoes’: social perspective-taking and verbal reference interpretation by children with autism

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Individuals with Autism Spectrum Disorder (ASD) often do not tailor language for specific listeners, i.e. they fail to use social perspective. Only one previous study examined whether individuals with ASD use social perspective to interpret referring terms (e.g. ‘the stripy ball’). Malkin et al. (2017) found that 5- to 7-year-olds with ASD did not differ from well-matched typically-developing (TD) children in correctly interpreting a referring term in relation to the activity they had shared with the specific speaker. In the current study, we manipulated a different aspect of social common ground. We told each child (C) that one experimenter (E2) had bought toys which the Requesting Experimenter (RE) had not yet seen. For each trial, E2 passed one of these (e.g. pink ball) over to RE, who discussed this with C. Then RE left and E2 showed C another object of the same type (e.g. yellow ball). When RE returned, she and C could see both objects. RE said ‘Oh wow, I like that ball. Can you put that ball in my box?’. We tested 24 eight- to eleven-year-olds with ASD. They were significantly less likely than 24 well-matched TD controls to select the object that was new for RE (p <.05) and significantly more likely to ask clarification questions such as, ‘which ball?’ (p < .01). The groups did not differ for either of these DVs in visual perspective-taking controls. Individuals with ASD have difficulty understanding that people tend to comment on things which are new for them.

16. Individuals with and without Autism Spectrum Disorder anticipate the intended message based on speaker’s voice: evidence from eye tracking

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Previous research has shown that when individuals listen to sentences that include a mismatch between meaning and the voice of speaker, a semantic anomaly type response (N400 effect) is observed, indicating that speaker-related mental models were instantly built (van Berkum, et al., 2008). It is claimed that individuals with Autism Spectrum disorders (ASD) have difficulties integrating information from the context to build pragmatic mental models while comprehending language
(Happe´, 1996). Hence, we aimed to examine two novel objectives in a pre-registered eye-tracking experiment: 1) Do adults with and without ASD predict upcoming linguistic input based on a speaker’s voice? 2) Are these social processes comparable in these groups? By applying the visual world paradigm, participants heard sentences that were consistent or inconsistent between voice and message, and concurrently viewed scenes that included consistent and inconsistent objects. All participants were slower to select the mentioned object in the inconsistent condition. Also, participants in both groups anticipated the consistent object at least 600ms before disambiguation, showing that participants rapidly integrated the speaker’s voice and used this to anticipate the content of forthcoming language. In conclusion, this study adds a novel contribution by showing anticipatory processes activated by speaker inferences. Crucially, participants with ASD performed comparably to TD participants. Hence, we suggest that contrary to general belief, pragmatic deficits in ASD are not necessarily due to the absence of social stereotypes/knowledge in autism.

17. **Computerised working memory based cognitive remediation therapy does not affect Reading the Mind in the Eyes test performance or neural activity during a Facial Emotion Recognition test in psychosis**

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Working memory based cognitive remediation therapy (CRT) for psychosis has recently been associated with broad improvements in performance on untrained tasks measuring working memory, episodic memory and IQ, and changes in associated brain regions. However, it is unclear if these improvements transfer to the domain of social cognition and neural activity related to performance on social cognitive tasks. We examined performance on the Reading the Mind in the Eyes test (Eyes test) in a large sample of participants with psychosis who underwent working memory based CRT (N = 43) compared to a Control Group of participants with psychosis (N = 35). In a subset of this sample, we used functional magnetic resonance imaging (fMRI) to examine changes in neural activity during a facial emotion recognition task in participants who underwent CRT (N = 15) compared to a Control Group (N = 15). No significant effects of CRT were observed on Eyes test performance or on neural activity during facial emotion recognition, either at p<0.05 family-wise error, or at a p<0.001 uncorrected threshold, within a priori social cognitive regions of interest. This study suggests that working memory based CRT does not significantly impact on social cognition as measured either behaviourally or neurally. It provides further evidence that deficits in the ability to
decode mental state from facial expressions are dissociable from working memory deficits, and suggests that future CRT programs should target social cognition in addition to working memory for the purposes of further enhancing social function.

18. **Remediating brain deficits in excessive use of internet through a short term training**
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In a high tech digital world, big data, automation, AI and technological change have significantly changed our brain and behavior and have consequences for human interactions and society. One of global issues is excessive use of online gambling, gaming, chatting and shopping, and these problematic online social networking has been linked to poor emotional regulation and deficits in brain functional and structural networks that affect our ability of attention, self-control, motivation and reward processing. For example, one recent study used one of the most popular smartphone-based applications for communication - WeChat to examine the associations between individual variations in tendencies towards WeChat addiction and brain structural changes. The fMRI results indicated that higher tendencies towards WeChat addiction were associated with smaller gray matter volumes of the subgenual anterior cingulate cortex, a key region for monitoring and regulatory control in neural networks underlying addictive behaviors. Moreover, this study also showed the smaller nucleus accumbens volumes, suggesting the reward system dysfunction. Taken together, these results indicated that excessive use of social networking, a behavioral addiction, could lead to Internet Communication Disorder (ICD) and affect our behavior and daily life. Our series of randomized studies have shown that a short-term integrative body-mind training (IBMT) significantly improves self-control ability through strengthening functional and structural changes in the self-control and reward networks such as anterior cingulate cortex and striatum/nucleus accumbens. These results raise a possibility to ameliorating the deficit of similar brain networks mentioned above and may help reduce the behavioral addiction.

19. **An investigation on Executive Functions and Theory of Mind across the Lifespan**
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Executive functions allow us to communicate and to interact in everyday life. Previous studies showed how Theory of Mind, defined as our ability to understand the others’ beliefs, thoughts, intentions, relies on Executive Functions; specifically, on Working Memory, Cognitive Flexibility and Inhibitory Control. Adopting a battery that included tasks that tapped the over-mentioned Executive Functions
and Theory of Mind abilities (e.g. desires, beliefs, perspective taking) we examined the differences between young adults and old adults. Overall old adults showed prolonged reaction times and less accuracy compared to young adults. Moreover, we explored social interactions in a more ecological context: we recorded the participant’s eye gaze during a face to face conversations and during real-world navigation. We also examined whether individuals were visually biased towards three posters depicting social (direct vs. averted gaze) and non-social scenes during the conversation. Results reveal participants’ eye gaze towards facial features, social and non-social objects.

20. **Bilingualism and social flexibility**
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Social flexibility can be defined as the ability to detect social cues and efficiently switch between and adapt to different social contexts. Based on this definition, studies have found bilinguals to be more socially flexible than monolinguals. However, research on bilinguals' social flexibility is still sparse. In order to understand this better, we designed an experimental study where we tested participants’ social flexibility both in terms of detection of social cues and in terms of social switch. Participants were presented with pictures of males and females along with an audio clip of a male or female voice. The faces on the pictures and the recorded utterances were either happy or angry. In some trials, the face and the voice were consistent with each other (i.e., both were male or female, or both were happy or angry), and in other trials, they were discrepant (e.g., a male face with a female voice, or an angry face with a happy voice). Two blocks were presented to measure cue detection. In the first block, participants had to determine whether the face and voice for each trial were consistent or discrepant based on gender. In the second block, consistency was determined based on emotion. Finally, to measure social switching, participants had to shift between the two tasks within a third block, at times being instructed to identify consistency based on gender, and at times based on emotion. Data collection is in full progress and results will be ready for presentation very shortly.

21. **An exploratory study on nomophobia**
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While smartphones and mobile devices contribute enormously to today’s society, overuse of smartphone and mobile devices may be associated with the development of a form of psychological dependency known as Nomophobia.
participants completed the Nomophobia Questionnaire (NMP-Q; Yildirim & Correia, 2015), Mobile Phone Involvement Questionnaire (MPIQ; Walsh, White & Young, 2010) and the Mobile phone-usage questionnaire (MP-use Q; King et al, 2014). Interpretations of the results suggest that gender and age are both significant predictors in explaining the prevalence of Nomophobia among users. Findings provide support for past literature and serve as additional evidence into the predictive factors of Nomophobia, furthering knowledge into smartphone etiquette among varying age groups and gender differences.

22. Making Student-Centered Discourse Work
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Educators have embraced the idea that student talk should occupy a front-and-center position in classrooms. But teachers are uneasy relinquishing their role as the producer or recipient of classroom talk and facilitating authentic student-to-student exchange. Developing teachers skills in scaffolding classroom discourse is essential. But so are activities that support and optimize peer dialog. We introduce a dialogic curriculum for middle-schoolers that optimizes dense peer-to-peer verbal and electronic discourse, describing with video illustration how it can work in the classroom. Students are constantly on call, needing to be accountable to one another in focused peer exchanges, in time developing and enforcing norms of intellectual discourse with one another. The electronic discourse medium provides a written record of dialog and supports interiorizing this dialogic frame in individual writing, as students envision what another might say and how to address it. Evidence regarding student outcomes is described.