Exploring the self-reference effect in ADHD

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Objectives: The self-reference effect (SRE) is an extremely reliable memory advantage for information encoded in relation to self, which is linked to increased attention during encoding. The present study examined whether children with Attention-Deficit Hyperactivity Disorder (ADHD) show a typical SRE, or if this is reduced as a result of their attentional difficulties.

Design: The study was a mixed design, comparing children with ADHD and a typically developing (TD) control group on their memory for items encoded in a self-referent and other-referent context.

Methods: There were 32 participants aged 5 - 10 years, 16 in the ADHD group and 16 TD children matched closely for chronological age, verbal age, non-verbal IQ and sex. Participants were tested using an evaluative self-referencing paradigm, in which a series of object images were presented with an image of either the child’s own or another child’s face. On each trial, the child was asked whether or not the child pictured would like the object. Recognition and source memory for the objects were then assessed.

Results: TD children displayed the expected SRE, remembering more items shown with their own face. However, this effect was not found within the ADHD sample.

Conclusions: These findings are the first to show that children with ADHD may not benefit from the usually robust SRE. The results support the suggestion that attention is a prerequisite for the enhanced encoding of incoming self-referential information, and have implications for the use of SRE strategies in the classroom for children with attentional difficulties.

Are autistic people perceived unfavourably because it is difficult to read their minds?

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Objectives: Previous research has suggested that people with ASD have behaviour that is harder to read than typically developing people. The purpose of the current research was to investigate whether being less readable was associated with being perceived as less socially favourable among those with ASD.

Design: A within-subjects design was used.

Methods: Thirty-one typically developing perceivers, viewed a series of 40 videos each featuring a single individual (‘target’). Twenty of these targets had ASD and 20 were developing typically. Each target was reacting to one of four scenarios: they were either told a joke, informed about the researcher’s difficult day, paid some compliments, or kept waiting. Perceivers were asked to rate each target on nine characteristics associated with social favourability.

Results: Targets with ASD were indeed perceived as less socially favourable than typically developing targets in all scenarios except for the waiting scenario, where targets in both groups were rated as less socially favourable. We also assessed the link between social favourability and readability. Readability of targets was taken from Sheppard et al. (2016) which used the same videos used in the present study, and was operationalised as the number of perceivers who correctly guessed the scenario to which the target was responding. We found a significant positive relationship between social favourability and readability.

Conclusions: This suggests that there may be a fundamental relation between being unreadable and being perceived as less socially favourable. This may contribute to poor social outcomes for individuals with ASD.
The relationship between calculation skill, finger-use in calculation, and finger gnosia in young children
Atsushi Asakawa, Kanazawa University

Objectives: Previous studies have shown that finger gnosia (the ability to identify the form of the hand and position of fingers without visual feedback) correlated with and selectively predicted arithmetical abilities in children. This study investigated the relationship between calculation skill, finger gnosia, and finger-use in solving addition problems after controlling for the effects of age and visuo-spatial short-term memory.

Methods: 49 children (67-79 months) participated in this study. Calculation skills were tested using 15 addition problems. In finger-use, the percentage of using finger in 15 addition problems were calculated. In finger gnosia, two of the children’s fingers were simultaneously touched by the examiner without a visual aid and then the children were asked to point to the relevant finger on the drawing of the stimulated hand. In visuo-spatial short-term memory, the examiner taps a sequence of blocks and children attempt to repeat the tap sequence in the same.

Results: Partial correlation analysis suggested that after controlling for the effects of age and short-term memory score, calculation skill and finger gnosia strongly related (r=.628, p<.01), but calculation skill and finger use, finger use and finger gnosia did not related (r=.102, r=.220, p>.10). In addition, multiple regression analysis showed that calculation skill was more strongly influenced by finger gnosia (β=.667) than age, finger-use, visuo-spatial short-term memory.

Conclusions: These results indicated that numerical operations are not merely abstract thinking, but are also based on physical, embodied experiences and the important body part for number is finger.

Visual-spatial abilities and task approach skills in Williams syndrome
Elisa Back1, Emily Farran2, Jo Van Herwegen1
1Kingston University London, 2Institute of Education, UCL

Objectives: The block design task (BDT) is used to measure visuo-spatial abilities and studies have reported that individuals with Williams syndrome (WS) perform poorly on this task. However, it is unclear what underlies their impaired performance. If poor performance is caused by atypical looking strategies then individuals with WS should have different looking patterns during the task. This was explored by measuring eye movements during the BDT in participants with WS.

Methods: Seventeen participants with WS were recruited, however eye-tracking data from only 11 participants (16-47 year olds) could be used. Individuals with WS were compared to matched Mental Age (MA) and Chronological Age (CA) typically developing groups. Using trials from a standardised task, participants were presented with 3-dimensional red and white cubes and asked to copy a pattern design from a book and a 3-dimensional example whilst Tobii glasses recorded their eye movements.

Results: Dwell times and number of visits were analysed for correct and failed items. Similar dwell times were found across the groups. For visits, WS and MA groups looked less often at the example and at their own cubes than the CA group for correct and failed items.

Conclusions: There is no evidence of ‘sticky fixation’ in the WS group as they did not have longer dwell times. However, they checked the example and their own cubes less often than the CA group suggesting they have a different task approach to the BDT.

What are students’, parents’ and teachers’ experiences of secondary school transition and how do they feel it could be improved?
Charlotte Bagnall, Yvonne Skipper, Claire Fox, Keele University

Objectives: Primary-secondary school transition is a major life event for eleven-year-old children in the UK, and can also be a stressful period for transfer parents and teachers. However, most research into this topic focuses on the impact of transition on children’s academic performance and social well-being and we have a limited understanding of emotional experiences in the lead up and during transition. This research explores students’, parents’ and
Design: To answer the research question, face-to-face focus groups were conducted with transfer children and asynchronous online focus groups with parents and teachers.

Methods: Twenty-four year seven students, thirty parents, and forty year six and seven teachers participated in the focus groups. Semi-structured question schedules were followed. Findings were analysed using Thematic Analysis.

Results: It was common for children to express feeling both excited and nervous leading up to transition. These feelings were shaped by perceptions of support, personality characteristics and beliefs in coping abilities. While environmental concerns such as getting lost were expressed during the first few weeks, social pressures, like making friends and academic concerns, particularly homework, were dominant themes prior and during the transition period. Parent and teacher data collection is ongoing but will be complete in time for the conference.

Conclusions: Emotional support over primary-secondary school transition is vital to improve transfer experiences for all stakeholders. This research will be used to inform an emotion centred support intervention for children during transition.

Ref: 1130 Review/ Theoretical & Practice Poster Presentation
Improving children’s emotional well-being over primary-secondary school transition
Charlotte Bagnall, Yvonne Skipper, Claire Fox, Keele University

Purpose: Interventions that have been developed to counter the negative outcomes which children commonly experience during transition to secondary school are limited in number and in their longevity and sustainability. Utilising mixed methods, this research aims to improve children’s experience of school transition by bringing school transition intervention research ‘to scale’ in real world settings.

Background: Conceptualised as one of the most difficult transitions in children’s educational careers, primary to secondary school transition is a major life event for eleven-year-old children in the UK, marked by developmental and psychosocial discontinuity and challenge. Negotiating multiple changes simultaneously can have a negative impact on children’s ability to cope, especially if children are not highly resilient and do not receive sufficient support.

Methods: As, emotional centred support provision over the transfer period is minimal, to inform my intervention, preliminary focus groups with parents, teachers and children have been conducted to explore their experiences and how they feel the transfer period can be improved. Case study research within a special primary school has also been conducted, to understand how children with added emotional difficulties, are supported to cope with the additional apprehension-anxiety commonly experienced during school transition. Findings from both will inform the design and delivery of a five week emotional centred support intervention, which will be implemented either by a trained member of staff or me in mainstream primary schools. To assess intervention efficacy children in control and experimental schools will complete a self-report questionnaire at three time points in the transfer year.

Keynote Speaker
Socio-cognitive and socio-emotional processes in the peer relationships of children and adolescents
Robin Banerjee, University of Sussex

In this keynote presentation, Robin will outline and integrate findings from a programme of research connecting children’s and adolescents’ thoughts, feelings, values, and behaviours in the context of their peer relationships. His work brings together a rich array of developmental research on theory of mind, group processes, self-presentation, relationship quality, mental health, and academic achievement. Combining studies of youths aged from 2 to 21 years, Robin will illuminate between-age group variability (developmental changes) and within-age group variability (individual differences) in diverse aspects of peer relationships. His studies show that studying peer relationships gives us an important window onto young people’s mental health. The peer context poses developmental challenges but also offers potential solutions for vulnerable groups of youths, especially in the way that it can support psychological growth and self-development.
Ref: 1291 Symposium
(S) Children's theory of mind and everyday social life
Robin Banerjee, University of Sussex

Symposium summary
This symposium addresses theory of mind development during middle childhood, focusing on how individual differences in mentalising skills are associated with aspects of children's everyday social lives. The first paper demonstrates that the accuracy of children's mental-state attributions, rather than the mere propensity to pay attention to mental states, is associated with higher levels of peer acceptance, which in turn is linked to lower levels of peer victimisation. The second paper uses a longitudinal design to delve into the association between theory of mind and peer relationships, revealing that aggressive behaviour mediates bi-directional inverse links between children's mental-state understanding and their level of rejection by their classmates. The final paper draws in children's experience of reading, showing that children's mentalising skills and children's frequency of reading are both related to prosocial behaviour, and that some aspects of cognitive empathy mediate the link between reading interactions with others and levels of prosociality. The discussant, Professor Claire Hughes from the University of Cambridge, will provide an integrated account of the insights gained from studying children's theory of mind in the context of their everyday social lives, and identify key directions for further research.

Ref: 1311 Empirical Oral Presentation
Paper 1 - Mentalising skills, prosocial behaviour, and everyday reading experience
Helen Drew, Jane Oakhill, Alan Garnham, Sebastian Sutcliffe, Robin Banerjee, University of Sussex

Objectives: The present research investigated if mentalising skills (theory of mind and cognitive aspects of empathy) are related to higher levels of prosocial behaviour. It focused additionally on children’s experience of reading, which some preliminary research suggests is connected with mental-state understanding.

Design: Correlational design assessing associations at one time-point.

Methods: We recruited 113 children aged 8 to 10 years from local schools. They provided scores for: a) self-reported prosocial behaviour using the Strengths and Difficulties Questionnaire; b) self-reported cognitive empathy (from Basic Empathy Scale and Empathy Questionnaire for Children and Adolescents), the Strange Stories task, and the Reading the Mind in the Eyes test; and c) frequency of reading to self and with others.

Results: Partial correlations, controlling for reading age, showed significant associations between prosocial behaviour and the composite mentalising score, r(106) = .38, p < .001, and also between prosocial behaviour and reading experience, r(106) = .25, p = .009 for reading to self, and r(106) = .19, p = .047 for reading with others. The cognitive Basic Empathy score (but not the overall mentalising composite) mediated the association between frequency of reading interactions with others and prosocial behaviour, ab = .04, 95% CI [.004 to .104].

Conclusions: Everyday reading experiences and mentalising skills are related to prosocial behaviour. We found initial indications that aspects of cognitive empathy may play a role in the link between reading interactions and prosocial behaviour. However, further research with longitudinal designs and other informants is needed.

Ref: 1308 Empirical Oral Presentation
Paper 2 - Theory of mind and peer relationships in middle childhood: The role of social behaviour
Luca Ronchi¹, Serena Lecce¹, Robin Banerjee²
¹University of Pavia, ²University of Sussex

Objectives: Individual differences in Theory of mind (ToM) in middle childhood have been linked to variations in the quality of children’s relationships with classmates. The present study investigated this association more deeply over time by focusing on the mediating role played by children’s social behaviour.

Design: Short-term longitudinal study with three time-points of data collection over one year.

Methods: We followed 274 children aged 9 or 11 years at the first time-point. At each time-point we evaluated children’s verbal ability, ToM (using the Strange Stories and Silent Film tasks), sociometric scores, and prosocial and aggressive behaviour with classmates, as reported by teachers. We adopted a multi-group cross-lagged modelling approach to track similarities and differences in pathways between age groups.
**Results:** The association between Time 1 peer rejection and lower ToM at Time 3 was mediated by higher aggressive behaviour at Time 2 within both age groups, ab = -.037; 95% CI = [-.091, -.008]. Crucially, the reciprocal negative association between ToM at Time 1 and peer rejection at Time 3 was mediated by children’s aggressive behaviour within the younger group only, ab = -.014, 95% CI = [-.031, -.004]. Results were independent of children’s verbal ability and autoregressive effects.

**Conclusions:** The present study supports previous research suggesting a bi-directional association between ToM and peer rejection in middle childhood. It extends our knowledge of the central role played by children’s aggressive behaviour, as a likely consequence of poor social understanding and difficult interpersonal experiences, for children’s further social and cognitive maladjustment.

**Ref:** 1306 Empirical Oral Presentation

**Paper 3 - Theory of mind, peer acceptance, and victimization in the classroom context**

Federica Bianco¹, Serena Lecce², Robin Banerjee²

¹University of Pavia, ²University of Sussex

**Objectives:** We investigated the interplay between theory of mind (ToM), peer acceptance and victimization in the classroom context, focusing on: a) if and to what extent children’s “propensity to pay attention to mental states” and their “accuracy in mental-state attributions” predict variance in the level of victimization experienced by the child; and b) if a significant proportion of this variance is explained by the well-known links between ToM and peer acceptance on the one hand and between peer acceptance and victimization on the other hand.

**Design:** Correlational design assessing associations at a single time point.

**Methods:** We recruited 146 children aged 8 to 11 years from local schools. They completed self-report ratings of victimization, a sociometric survey, measures of verbal ability, executive functioning, and SES. ToM was measured through the Strange Stories task, coded for the number and accuracy of mental-state attributions.

**Results:** Results showed that accuracy in mental-state attributions (but not propensity to pay attention to mental states) was a key predictor of lower levels of victimization, b = -0.24, p = .020. Mediation analyses confirmed an indirect effect via greater peer acceptance, ab = - 0.05, 95% BCa CI [-0.14, -0.006].

**Conclusions:** Results advance our understanding of the social consequences of ToM. Specifically, they indicate that the ability to make accurate mental-state attributions (as opposed to simply paying attention to mental states) is a predictor of peer acceptance, which in turn translates into lower levels of victimization. Caution is warranted because of the cross-sectional nature of our data and the use of self-report measures.

**Ref:** 1148 Empirical Poster Presentation

**Validating a developmentally appropriate mental imagery task battery**

Kathryn Bates¹, Marie Smith², Emily Farran¹, UCL, Institute of Education

¹UCL, Institute of Education, ²Birkbeck College, University of London

**Objectives:** Despite mental imagery (MI) playing a key role in spatial abilities and reasoning, only two previous studies to-date have investigated the development of the components of MI. The aim of this study is to validate a new battery of MI tasks that address previous methodological issues and inconsistent results.

**Design:** This study adopts a repeated measures design with adults in order to validate the MI battery for use in our planned developmental trajectory study.

**Methods:** Each participant (aged 18-40 years, N=85) will complete a battery of tasks measuring: image generation, image maintenance, image scanning and image rotation. Tasks are designed to measure the sensory strength of images, the subjective experience of imagery and ability to generate, maintain and transform mental images within a developmentally appropriate battery for the first time.

**Results:** Data collection will conclude in August. Analyses will determine the extent to which each task measures the intended component of MI. The image generation paradigm comprises three tasks which are predicted to evidence the depictive nature of the image and image generation ability. Image maintenance load will be manipulated via changes to inter-stimulus-interval; an effect of load will demonstrate that participants are using MI. Similarly, we predict a linear time-distance (scanning) and linear time-angle (rotation) relationship, as evidenced in previous
Conclusions: Provided that the battery of tasks reliably measure each component of MI, thus addressing previous methodological issues, this battery will subsequently be used to investigate the development of MI in typical and atypical groups of children.

Ref: 1224 Empirical Oral Presentation
Parental attitudes and sex-typed toy preferences in Polish and British infants.
Marta Beneda, Melissa Hines, University of Cambridge

Objectives: Sex differences in children’s toy preferences are robust and have been observed as early as 12 months of age. Parents tend to have different expectations about the behaviour and characteristics of sons and daughters, and this may influence children’s sex-typed toy preferences. However, few studies have related parents’ gender attitudes to infants’ toy preferences. Prior research also has been confined to countries where parents generally have liberal attitudes regarding children’s gender-related behaviour. This study investigated sex differences in infants’ toy preferences in rural Poland and urban Britain, examining the relationship between toy preferences and parental attitudes.

Design: Infants’ toy preferences and parents’ gender attitudes were assessed. Parental attitudes were hypothesized to predict infants’ toy preferences.

Methods: The toy preferences of 28 Polish and 33 British infants (aged 14-24 months) were assessed using a visual preference paradigm and a free play session. Parents completed the Child Gender Socialization Scale.

Results: Girls looked at and played with dolls more than boys, whereas boys looked at and played with cars more than girls. These sex differences were consistent across samples. Parents in Poland showed stronger gender-typed attitudes than parents in Britain, but parental attitudes did not predict children’s toy preferences.

Conclusions: There appears to be no relationship between parents’ gender-related attitudes and their children’s sex-typed toy preferences. Additionally, sex differences in toy preferences were similar in urban Britain and rural Poland, despite differences in parental attitudes in these two locations. These results suggest that factors other than parental gender attitudes influence children’s toy preferences.

Ref: 1117 Review/ Theoretical & Practice Oral Presentation
Do children “conserve” or “estimate” quantities in Piaget’s conservation task? A systematic review and meta-analysis.
Giacomo Bignardi1, Maria Copot2
1MRC Cognition and Brain Sciences Unit, 2University of Cambridge

Purpose: This systematic review evaluated the role of children’s quantity estimation abilities in Piagetian conservation tasks.

Background: In a typical conservation task, two identical quantities (e.g. glasses of water) are presented to an observing child, and then one of the quantities is transformed (e.g. poured into a wider glass). Young children’s failure to understand that certain changes to the appearance of objects do not influence quantity, has long fascinated psychologists (Piaget, 1941). The prevailing assumption is that successful conservation requires the child to remember that the amounts were initially equivalent, and recognise that certain transformations do not influence quantity.

Methods: Using meta-analysis, controlled trials were synthesised comparing children’s performance in a standard conservation task to a static conservation task where children only see the post-transformation quantities; such as two equal amounts of water in differently sized glasses. Additionally, correlational studies were synthesised examining associations between conservation and visual quantity estimation tasks.

Conclusions: Across 11 studies (1205 participants), of limited quality, children in the standard conservation group were only 11% (95%CI [.01, .23]) more likely to succeed than children in the static conservation group, and this effect decreased in older samples (R2 = -.15). Furthermore, we found that group performance on static conservation tasks predicts mean sample age (R2 = .51), and correlates with individual standard conservation performance (r = .43, 911
participants). These results suggest that visual estimation abilities develop with age and play a significant role in conservation, corroborating hypotheses linking conservation to contemporary number estimation tasks.

**Distinguished Contributions Award Winner**

**Language, sex chromosomes and autism: unravelling the mystery**

Professor Dorothy Bishop, *University of Oxford*

In the 1960s several centres embarked on newborn screening studies to identify children with an extra X or Y chromosome, with the aim of identifying how this additional genetic material affected development. The general conclusion was that verbal skills tended to be depressed in girls with trisomy X and in boys with Klinefelter’s syndrome (XXY) or XYY syndrome. This is intriguing because most genetic conditions have a more general effect on neurodevelopment, rather than selectively impacting language. Cognitive profiles are quite variable both between and within the different groups, but overall the effect of an additional sex chromosome is far less severe than that of other trisomies. I will describe results from two studies of children with sex chromosome trisomies, both of which confirmed a high rate of language impairment but also found an increased rate of autism spectrum conditions, which had not been noticed in earlier research. However, average results masked wide individual variation. The study of children with sex chromosome trisomies raises questions about the nature of the relationship between language disorder and autism spectrum disorder: do these conditions have shared risk factors, or are there different risks for children depending on whether they have XXX, XXY or XYY karyotype?

Ref: 1241 Empirical Oral Presentation

**Relationship of oral language ability, non-verbal ability with reading comprehension in mainstream secondary school-age students**

Morag Boyes, Victoria Joffe, Rosalind Herman, Shashivadan Hirani, *City, University of London*

**Objectives**: Secondary teachers use written material as a medium for learning and it is argued that at secondary age, complex oral language is required to explain complex ideas. Yet a significant number of students in secondary education have literacy difficulties and some students with reading comprehension problems appear to go ‘unnoticed’ in the classroom.

The aim of the study is to explore the relationship of oral language, non-verbal skills, socio-economic status with reading comprehension of secondary school students across years 7, 8 and 9 from a mainstream secondary school in an area of high social deprivation. This presentation will explore the relationships between verbal and nonverbal language, decoding of words, reading comprehension and social deprivation for a single cohort over a two year period.

**Design**: The study is based in a mainstream secondary school. The sample includes 445 key stage 3 students: 163 Year 7 (mean age 11:10); 158 Year 8 mean age 12:10); and 124 Year 9 students (mean age 13:10). The students completed a range of oral language, non-verbal and literacy measures over two time points to provide the longitudinal data exploring growth and stability of performance over time.

**Results**: The preliminary data suggests that a large number of students have difficulties in recalling information and using the information in spoken paragraphs to work out cause-effect relationships, and make predictions and inferences.

**Conclusions**: The longitudinal profiles of students will be discussed, providing key information on the development of language and literacy across the secondary school years.

Ref: 1155 Empirical Poster Presentation

**Do children show partner specificity when using ambiguous symbols?**

Nera Bozin, Mafalda Batista Da Costa, Erika Nurmsoo, *University of Kent*

**Objectives**: Children expect conversational partners to use consistent expressions – referential pacts. Three-year-old children are sensitive to referential pacts: They are slower when the original partner refers to a target object using a new expression, 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.

**Design:** We tested more than 40 three- to five-year-old children to explore their referential expectations of drawings. One experimenter established the initial meaning by clearly drawing the target (e.g., a ball drawn as a circle). Either the same experimenter or a new experimenter used the same drawing to request the original object (a different ball) or a new, similarly shaped object (e.g., a plate).

**Results / Conclusions:** Children were slower to reach for the new object comparing to the originally drawn object. Similar results are seen in their errors. However, reaching for a new object with a new experimenter was not faster than with the old experimenter, which suggests referential pacts may not be the same for language and drawings. These findings also emphasize the role of artist intent when naming a drawing.

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**Ref: 1160 Empirical Oral Presentation**

**Sequence prediction in children with and without Developmental Coordination Disorder**

Daniel Brady, Lewis Ralph, Bertram Opitz, Hayley Leonard, *School of Psychology, University of Surrey*

**Objectives:** The ability to correctly sequence movements is vital for their smooth execution, and difficulties in sequencing may play a role in the movement difficulties characteristic of developmental coordination disorder (DCD). The aim of this study is to investigate whether sequence perception, prediction, and production across a number of domains are affected in children with DCD.

**Design:** This study used a three group design to compare typically developing (TD) children, children with DCD, and children with DCD and language problems (DCD+Lang). Each group will contain 30 7-10 year-olds.

**Methods:** Each child undertook a series of standardised tests to assess their eligibility (i.e. measures of motor ability, IQ, and language). Children who fit the selection criteria undertook the sequence prediction tasks. These included: Visuo-perceptual, spatial, temporal, linguistic and motor tasks. For all tasks half of the sequences presented deviated from an established rule by swapping the order of two of the stimuli. At the end of each sequence the children were asked whether they thought the sequence deviated. In addition to behavioural responses, Electroencephalography was collected throughout the task as a neural measure of sequence prediction.

**Results:** Data collection is ongoing, preliminary results will be presented. Children in the DCD+Lang group are expected to perform more poorly than the TD group on all tasks. Performance of the DCD group is less clear due to conflicting previous results. If children with DCD do demonstrate difficulties, it is expected that they would accompany an attenuated and/or delayed neural response to sequence violations compared to the TD group.

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**Ref: 1226 Empirical Oral Presentation**

**The relationship between predictive eye movements and motor ability in children with Developmental Coordination Disorder**

Emma Campbell¹, Elizabeth Pellicano², Emily Farran¹

¹UCL Institute of Education, ²Macquarie University

**Objectives:** Making use of advance visual information to prepare and execute a movement requires cognitive control of behaviour (e.g., anticipation, prediction and inhibition). The present study provides an extensive account of eye movement control in Developmental Coordination Disorder (DCD) by assessing how these children plan and make saccadic responses and pursuit movements, and whether this affects preparation of subsequent motor responses.

**Design / Methods:** In a cross-sectional study, fifty children with DCD (aged 5-15 years) and thirty typically developing (TD) children (aged 5-14 years) were tested on smooth pursuit (horizontal and vertical), pro and anti-saccade tasks, and an occlusion task that measured ability to make predictive eye movements, without visual feedback. Eye movements were recorded using a Tobii TX300 device, and motor ability assessed using the Movement-ABC2.

**Results:** The ability to make and inhibit saccades (accuracy, reaction times), pursuit movements (gain) and the functioning of predictive mechanisms, and how this relates to motor abilities (throwing, catching etc.,) will be discussed. Preliminary analyses indicate that differences exist in gaze behaviour between groups. TD children make accurate saccades to presented targets, and are able to inhibit prepotent saccades, whereas it is predicted that DCD
children will be less accurate and less able to inhibit. In the occlusion task, children with DCD make less saccadic movements when waiting for the stimuli to reappear on screen, compared with the TD group.

**Conclusions:** The motor deficit in DCD extends to eye movement control. Specifically, children with DCD group struggle to anticipate and plan their movements.

Ref: 1263 Empirical Oral Presentation

Deconstructing early adolescents' sexual consent beliefs for non-coital sexual activity: a thematic analysis

Jennifer Cassarly, Paul van Schaik, Anna van Wersch, Nikki Carthy, Teesside University

**Objectives:** Although sexual-consent negotiation is integral to sexual violence, it is largely unexplored 1) among young adolescents who are just beginning to have intimate relationships and 2) in relation to non-coital sexual behaviour (e.g. kissing) that is likely to be more salient among younger adolescents than other forms of sexual activity (e.g. intercourse). This study explores adolescents’ underlying beliefs about sexual consent negotiation for non-coital sexual activity.

**Design:** A focus group design is used, as the initial phase of a mixed-methods project using the reasoned action approach, an integrative model for behavioural prediction. Analysed are 1) barriers to and facilitators of consent negotiation, 2) social influences on sexual consent, and 3) behavioural beliefs associated with sexual consent negotiation.

**Methods:** Fifteen opportunistically recruited single-sex focus group discussions (N = 66, 63% female) comprising adolescents ages 11-13 in school years 7 and 8 from the North of England were conducted. Vignettes depicting sexual coercion in heterosexual encounters were used to facilitate questioning about consent beliefs. This was to allow actions in context to be explored and enable young people to discuss consent without disclosing individual experiences. An inductive thematic analysis was used to analyse the in-depth semi-structured group interviews

**Results:** Main themes include responsibility, consent as an ambiguous process, barriers to and facilitators of sexual consent negotiation and contextual factors that influence consent negotiation (e.g. clothing, location).

**Conclusions:** Clear themes emerged which provide useful insight into what early adolescents believe about sexual-consent negotiation. These findings have implications for adolescent sexual health, education and sexual violence prevention.

Ref: 1264 Empirical Poster Presentation

Conceptualisations of happiness at school and its link with competence, autonomy, and relatedness

Mara Cattini, Flavia Cirimele, Jana Kvapilova, Luigi Portino, Antonio Zuffiano, Belen Lopez-Perez, Liverpool Hope University

**Objectives:** Recent reports have pointed to low levels of happiness at school (The Good Childhood Report, 2017). Given that autonomy, competence and relatedness are key to experience higher wellbeing at school, we aimed to explore if happiness conceptualisations were linked to higher levels of those variables.

**Methods:** A sample of children (9 to 11 year-olds; N=421; Mage=10.75; 53% females) and adolescents (12 to 14 year-olds; N=323; Mage=13.37; 48% females) were asked to define what made them happy at the school and reported their levels of autonomy, competence and relatedness (Tian, Han, & Huebner, 2014).

**Results:** Thirteen themes of happiness emerged. For children, we found a positive relationship between happiness as positive feelings and higher scores in competence while the conceptualization of non-violence was negatively related to higher scores of relatedness and competence. For adolescents, the conceptualizations of positive feelings, good grades, friends, moral actions and self-efficacy were positively related to higher scores of autonomy, relatedness, and competence. The conceptualization of positive relationships with teachers was positively related to higher scores of relatedness and competence. Finally, the conceptualization of purpose was positively related to higher scores of relatedness.

**Conclusions:** These results showed the importance that adolescents’ relatedness plays in the school context, as it closely related to several conceptualisations of happiness. We elaborate on the developmental differences in conceptualising happiness and we discuss on the practical implications of our findings.
Ref: 1272 Empirical Poster Presentation
Do people with Autism know their own minds: Metacognition and cognitive offloading of delayed intentions in ASD
Ishita Chowdhury, Sam Gilbert, Institute of Cognitive Neuroscience, University College London

Objectives: Prospective memory (PM) is the ability to remember tasks which have to be done in the future. In real life people use reminders to help with PM, e.g. set up smartphone reminders. This is known as ‘cognitive-offloading’. To judge whether or not one requires reminders, individuals analyse their costs (e.g. time spent setting them up) and benefits (e.g. greater likelihood of remembering). Such assessments require knowledge of one’s own mind, i.e. metacognition. People with ASD are thought to have impairments in metacognition, and therefore may not be able to judge the costs and benefits of using reminders in relation to their PM. We aimed to investigate if ASD individuals are optimal in choosing between using their memory and using reminders (cognitive-offloading) based on metacognitive knowledge about their own PM abilities.

Design: A between-subjects design was used to compare PM performance and cognitive-offloading behaviour between ASD and TD adults.

Methods: A touchscreen-tablet based delayed-intention paradigm was used to examine PM, metacognition and offloading strategy in 27 highly-functioning ASD and 29 matched TD adults, in the presence of external monitory reward (which was proportional to performance).

Results: ASD performance in unaided PM task and cognitive-offloading behaviour was comparable to TD. ASD showed efficient metacognitive judgement and control.

Conclusions: This suggests that metacognition is not necessarily impaired in ASD and that monitory reward can possibly improve PM performance and strategy-use in ASD. The implication that external motivation helps ASD individuals strategize better, can help devise ways to motivate ASD individuals to make decisions and problem-solve more efficiently.

Ref: 1318 Empirical Oral Presentation
Ripped by a sticker or poked by a pen: Can pre-schoolers infer causal structures or do they learn associations?
Zeynep Civelek, Christoph Völter, Amanda Seed, University of St Andrews

Objectives: Adults use two routes for learning new things: they can associate two arbitrary events or find a causal explanation. This research explored whether pre-schoolers could extract causal structures based on spatiotemporal cues or instead relied on arbitrary associations to locate a reward. Contrary to previous research on causal reasoning, we used a nonverbal methodology since language has been shown to scaffold children’s causal reasoning abilities.

Design: We manipulated the temporal order of a causally relevant cue within subjects in a search paradigm that did not depend on verbal scaffolding.

Methods: 3-5-year-olds (N= 65) were presented with two cups covered with foil. The experimenter ripped both cups behind a barrier, one was ripped while hiding a sticker, the other by poking the foil with a pen. All children received both orders in counterbalanced order. We investigated whether children used a causally relevant cue (ripped foil due to hiding the sticker) and temporal information (ripped foil after the hiding event) to locate the sticker in the correct cup; or whether they used an arbitrary rule (e.g., choosing the most recently ripped foil) instead.

Results: Age significantly predicted children’s scores (F(2, 58)=15.53, p<.01). Four- and 5-year-olds performed similarly and better than 3-year-olds. Preliminary analyses suggested that 3-year-olds might have used an association (i.e. select the cup that is ripped first) whereas 4- and 5-year-olds took advantage of the causal structure.

Conclusions: By 4-years of age, children can use spatiotemporal relations in causal structures to make inferences in the absence of causal language.
**Ref: 1265 Empirical Poster Presentation**

**Meaningful Texture: visual-tactile matching of texture in ASD.**

Tascha Clapperton\(^1\), Vicki Bruce\(^3\), Deborah Riby\(^3\), Adrian Rees\(^1\)

\(^1\)Newcastle University, \(^2\)Durham University

**Objectives:** The objective of the research was to explore cross-modal matching in ASD and to see whether giving texture a meaningful context could improve performance. Children were asked to match texture presented visually and haptically in a same-or-different task. In the first study, children with ASD and children with ADHD were matched on both verbal and non-verbal ability to typically developing children identified from a total pool of 105 TDs. Texture was presented in isolation (no context). Results found that children with ASD (N = 11, mean age = 11 years), perform significantly worse at visual-tactile texture matching than typically developing children (N = 22, mean age = 9.7 years) and children with ADHD (N = 11, mean age = 11.3 years). In the second study, texture was presented within a visual scene which created a meaningful context. Results showed that children with ASD (N = 16, mean age = 11.6) perform significantly worse than typically developing children (N = 32, mean age = 11). The research concluded that presenting texture within a meaningful context does not appear to aid accuracy in visual-tactile matching tasks for individuals with autism.

**Ref: 1178 Empirical Poster Presentation**

**Children’s performance on three versions of the Object Choice Task**

Hannah Clark, David Leavens, University of Sussex

**Objectives:** Reviews of the Object Choice Task (OCT) literature highlight the use of incommensurate testing environments when comparing across species. We tested human children with versions of the OCT that have been previously used with dogs and nonhuman primates to see if manipulating the set-up would lead to behavioural changes.

**Design:** Two within-subjects experiments were conducted. Study 1 examined the effect of the imposition of a barrier between the participant and the apparatus and experimenter, as experienced by nonhuman primates who are tested from within a cage for safety reasons. Study 2 compared performance on central and peripheral versions of the task, previously used with nonhuman primates.

**Methods:** Nineteen 18-month-olds and twenty 36-month-olds participated in Study 1. Thirty-two 3-year-olds took part in Study 2. In both studies, videotapes of the sessions were later coded for correct response, response type, response latency and type, if any, of accompanying gaze and vocalisation behaviours.

**Results:** In Study 1, there was no effect of barrier on performance, but participants used more pointing gestures in the barrier condition. With no barrier present, the children tended to grab the container. This difference was especially pronounced for the 18-month-olds. In Study 2, participants pointed more in the peripheral condition, and tended to grab in the central version.

**Conclusions:** Differences in the experimental set-up can cause changes in behavioural responses in children who are expected to perform at ceiling level and thus shows that incommensurate testing conditions when comparing across species in this area represent an experimental confound.

**Keynote Speaker**

**Development and maintenance of anxiety disorders in children: Implications for increasing access to effective treatments**

Professor Cathy Creswell, University of Reading

Anxiety Disorders are the most common mental health problem across the lifespan, create a huge personal burden for individuals and substantial economic burden for society. They have a particularly early age of onset and often run a chronic course with half of all people who experience an anxiety disorder at some point in their life first experiencing those difficulties by the age of 11 years. Yet we have recently found that less than 3% of children with an anxiety disorder receive an evidence based intervention. This talk will give an overview of recent research on the development and maintenance of anxiety disorders in children, with a particular focus on the implications for
Ref: 1103 Empirical Poster Presentation
Anything can come from nothing? 12-month-old infants’ understanding of the appearance of an object from an empty location
Viktoria Csink¹, Andrea Balazs ², Denis Mareschal¹, Teodora Gliga¹
¹Birkbeck University of London, ²Budapest University of Technology and Economics

Objectives: The aim of the study was to investigate whether 12-month-olds have a representation of "absence"; namely, will they detect the impossible appearance of an object from an empty location.
Design: We used a within-subject design. Each infant saw the possible and impossible appearance of an object. Looking times to each outcome were measured in a violation of expectation paradigm.
Methods: Twenty-two 12-month-olds (M = 366.6, SD = 9.69) participated in this study. In the Impossible appearance condition infants saw 1) an object removed from a box 2) demonstration that the box is empty 3) object appears from the empty box. In the Possible appearance condition infants saw 1) an object placed in a box 2) demonstration that another box is empty 3) object appears from the first box.

Results: A 2x2 mixed design ANOVA with condition (violation, control) and order (violation/control first) revealed a significant condition X order interaction: F (1,20) = 4.603, p = 0.044, ηp² = 0.187, with longer first looks in the control in the first trials.
There was also a significant main effect of condition, F (1,20) = 7.742, p = 0.011, ηp² = 0.279, with longer first looks in the control.

Conclusions: Longer looks in the control might have resulted from the pragmatic inconsistency of the events, i.e. that the demonstration of the empty box was irrelevant in the communicative situation. This effect was most pronounced in the first trials.
The results indicate that infants did not respond to the violation of impossible appearance.

Ref: 1147 Empirical Oral Presentation
A Naturalistic Home Observational Approach to Pre-Schoolers' Language, Cognition, and Behaviour.
Katrina d’Apice¹, Rachel M. Latham², Sophie von Stumm¹
¹London School of Economics and Political Science, ²Kings College London

Objectives: To use digital language recordings to observe how linguistic home environments and parental affect are associated with pre-schoolers’ language, cognitive abilities and behaviour. We hypothesise that linguistic home environments will predict pre-schoolers’ language and cognitive abilities, whereas parental affect will predict pre-schoolers’ behaviour.
Design: The naturalistic, repeated-observations design increases external validity and reduces social desirability biases.
Methods: We use Language Environment Analysis (LENA) to unobtrusively audio record 107 monolingual-English pre-schoolers, aged 24 to 48 months (M = 32, SD = 6.5), and their families over 3 days (M = 15.06 hours per day, SD = 1.87). We use the Parent Report of Children’s Abilities (PARCA) to assess children’s cognitive abilities, via an online survey and testing booklet.
We extract adult word counts from LENA, and transcribe 6 x 5 minute audio excerpts (30 minutes) per family to measure adult and child lexical diversity. We rate parents’ positive and negative affect, and children’s internalising and externalising behaviours from the audio excerpts.
We then build regression models to test associations between adult variables and child outcomes.

Results: Adult word counts predicts PARCA booklet scores (B = .16, 95% CIs [.08, .53]) and adult lexical diversity predicts child lexical diversity (B = .42, 95% CIs [.24, .60]). Positive parental affect predicts externalising behaviour. (B = -.25, 95% CIs [-.45, -.04]).

Conclusions: LENA is a useful tool for capturing naturalistic data of pre-schoolers’ linguistic home environments. We
corroborate constructivist theory of language acquisition.

Limitations: Data are cross-sectional.

Ref: 1305 Empirical Poster Presentation

Role-confusion in adolescence: the new method for assessing role-confusion in family from adolescent perspective
Petra Daňsová, Lenka Pivodová, Lenka Lacinová, Institute for Research on Children, Youth, and Family, Masaryk University, Czech Republic

Objectives: Boundaries in family systems are considered as an important aspect of healthy family functioning. The role-confusion in child-parent dyad may have negative impact on child development. The aim of this study is twofold: 1) to introduce a new method for measuring role-confusion in adolescents and 2) to explore relationship between role-confusion, internalizing and externalizing problems in children, and parental attachment.

Design: First, we created self-report questionnaire for measuring role-confusion focused on instrumental and emotional role-confusion in mother- and father-child dyad in the present family context. Psychometric properties were examined in two pilot studies. Next, we looked at relationships between role-confusion, internalizing and externalizing problems, and parental attachment.

Methods: 212 Czech adolescents completed questionnaires (mean age=14.02, SD=2.05, age range 11–18 years). These adolescents participate in a 2-year longitudinal project. We assessed role-confusion (a new method), parental evaluation of adolescents internalizing and externalizing problems (SDQ), and parental attachment reported by adolescents (ECR-RS). We conducted exploratory factor analysis (Study 1). The results of the confirmatory factor analysis and multiple regression analysis will be presented (Study 2).

Results: The results shows a three-factor structure of the questionnaire with instrumental role-confusion and maternal and paternal emotional role-confusion. In the second study, we assume that the more role-confusion adolescent describes, the higher the internalizing and externalizing symptoms, and attachment anxiety and avoidance are.

Conclusions: The new method for assessing role-confusion from adolescent perspective was created.

Ref: 1315 Empirical Oral Presentation

Age differences in attitudes to mathematics
Ann Dowker1, Olivia Cheriton2, Rachel Horton3
1Oxford University, 2Lady Margaret Hall, Oxford, 3St Anne’s College, Oxford

Objectives: Objectives were (1) to investigate age differences between pupils in Years 2, 6, 9 and 12 in attitudes to mathematics; and (2) to examine gender differences in attitudes and performance.

Design: A between-participants design was used with age group and gender as grouping factors, and attitudes and performance as dependent variables.

Methods: Participants were 216 pupils, equally divided by gender, from Years 2 (6-to 7-year-olds), 6 (10-to 11-year-olds), 9 (13-to 14-year-olds) and 12 (16-to 17-year-olds) participated in the study. They were given (1) the Mathematics Attitude and Anxiety’ questionnaire (Krinzinger et al, 2007) which assesses Liking for Mathematics; Self-Rating in Mathematics; Mathematics Anxiety; and Unhappiness at Failure in Mathematics; and (2) the British Abilities Scales Basic Number Skills Test (scaled for age) to establish actual mathematics performance. Between-participant ANOVAs tested significance of age group and gender differences.

Results: All attitudes became significantly more negative with age. Liking for Mathematics declined from a mean of 27.78 out of a maximum 35 in Year 2 to 21.48 in Year 12; Self-Rating from 28.85 in Year 2 to 24.11 in Year 12; (non)-Anxiety from 21.63 to 14.48; and (non)-Unhappiness at Failure from 20.05 to 13.48. Boys showed higher Liking for Mathematics and Self-Rating than girls but did not differ in other attitudes or in actual performance.

Conclusions: Attitudes to mathematics were consistently more negative in older than younger pupils. Girls liked maths less than boys and rated themselves lower, but performed equally well, and did not show higher anxiety.
English and Chinese children’s representation of numbers
Ann Dowker, Anthony Li
1Oxford University, 2Somerville College, Oxford

Objectives: East Asian pupils usually perform better than Western pupils on international comparisons. Some have suggested that a contributory factor is the transparent counting systems of East Asian languages, which may facilitate number representation. Objectives are to investigate whether Chinese and English children would differ on a two-digit number comparison test, measuring place value representation, and a number line estimation task, measuring spatial representation of number.

Design: A between-participants design compared the groups on three mathematics tests: (a) a standardized arithmetic test; (b) a two-digit Number Comparison task; and (c) a Number Line estimation task.

Methods: 35 seven-year-old second-year primary school children in Oxford, England and 40 children of similar age in Hong Kong, China were given the British Abilities Scales Basic Number Skills test; Donlan & Gourlay’s (1999) two-digit Number Comparison task; and Siegler & Booth’s Number Line Estimation task, involving placing numbers appropriately on four number lines from 1-10 to 1-1000. Between-participants ANOVAs were used to test significance.

Results: The Chinese children were significantly more accurate than the English children on the Number Comparison task: (mean score 26.3/27, s.d. 0.94, versus 24.21/27, s.d. 2.6), and also faster and less variable in reaction time. However, they did not differ significantly in their performance on any aspect of the Number Line Estimation task. Unexpectedly, they also did not differ in their performance on the standardized arithmetic test.

Conclusions: Results indicated counting transparency effects on a place value task; but not on spatial representation of numbers on a number line.

Does website accuracy affect children’s selective trust in online information?
Shiri Einav, Alexandria Levey, Priya Patel, Abigail Westwood, University of Nottingham

Objectives: In this age of “fake news”, it is crucial that children are equipped with the skills to identify unreliable information online. Yet little is known about early critical digital literacy. Our study is the first to examine whether children are influenced by the presence of errors contained in websites when deciding which sources to trust.

Design: Participants viewed three pairs of websites about child-friendly topics (e.g., the North Pole). For each pair, one website contained obvious errors (e.g. factual, typographical or exaggerations, according to condition) whereas the other did not. Importantly, the paired websites offered conflicting claims about two facts piloted to be unfamiliar to children of this age (e.g., thickness of ice in North Pole).

Methods: We tested children in Key Stage 2 (8-10 year-olds, N = 53) from local schools. Across six test trials, participants were asked questions pertaining to the novel facts to examine whether they systematically selected answers from accurate websites. Justifications for responses were also obtained.

Results: We found no evidence for a preference toward using information from the accurate websites. There was no effect of error type. Only a minority of participants (17%) justified their choice of answer at least once with reference to website accuracy.

Conclusions: Our findings suggest that 8-10 year-olds are not influenced by the presence of errors when deciding which websites to rely on for obtaining new information. This study begins to highlight children’s limitations in critically evaluating the quality of material online and indicates a potential focus for digital literacy instruction.
Is the motor impairment in Attention Deficit Hyperactivity Disorder (ADHD) a co-occurring deficit or a phenotypic characteristic?

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Objectives: Motor deficits are often reported in individuals with Attention Deficit Hyperactivity Disorder (ADHD). The aim of this study was to determine whether this motor impairment represents a phenotypic characteristic of ADHD or a co-occurring deficit.

Design / Methods: Participants with ADHD (N=50) and typically developing (TD) motor-matched control children (N=75) completed the largest battery of assessments of motor function that have been used with this population to-date, as well as a measure of inhibition. Parents/ care-givers also completed a number of questionnaires relating to ADHD symptomology and a retrospective report of motor milestone achievement.

Results: A motor deficit was observed in 44% of our sample. Few relationships were observed between ADHD core characteristics and motor competence. Furthermore, the motor deficit observed in ADHD did not represent a simple delay in development; rather, there was an uneven profile of motor performance across different motor tasks. Interestingly, although power was limited for the motor milestone measure, it appears that motor milestone achievement is not delayed in ADHD.

Conclusions: The motor deficit observed in ADHD is a co-occurring deficit and not inherent to ADHD. Moreover, the motor deficit does not appear to be present early in development. This is discussed from the neuroconstructivist framework that subtle impairments in infancy might have cascading impact on the later development of motor competence.

A Systematic Review of Empathy Deficits in Autism and Psychopathy

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Purpose: This systematic review addressed 1) whether patterns found in a 2005 review regarding the presence of three empathy components (cognitive, motor, and emotional) in autism spectrum disorder (ASD) and psychopathy are still apparent when additional studies are considered, and 2) if the presence of cognitive and emotional emathies in children with ASD or conduct disorder (CD) is comparable to that of adults with ASD or psychopathy.

Background: The most recent review of empathy deficits in ASD and psychopathy, by Blair in 2005, found that individuals with ASD were impaired regarding cognitive and motor emathies, whilst persons with psychopathy had difficulties concerning two aspects of emotional empathy: sadness and fear.

Methods: Following searches of seven electronic databases and grey literature, study inclusion was based on Cochrane guidelines (to evaluate the quality of each study) and publication year (1995 onwards). This resulted in 94 studies which featured a total of 8,276 participants.

Conclusions: As found by Blair, individuals with ASD did exhibit impaired cognitive and motor emathies. Contrary to Blair, regarding ASD, adults had a general impairment in emotion recognition; interestingly, children with ASD were unimpaired. Agreeing with Blair, most adults with psychopathy showed deficits in emotional empathy regarding sadness and fear, however, a sizeable minority had a more general emotional empathy deficit. Diagnostically, it can be difficult to distinguish between ASD and both psychopathy and CD; findings in this review indicated that conditions differ in their pattern of empathy impairments, hence these patterns may be of considerable diagnostic value.
Ref: 1214 Empirical Oral Presentation
Does the contribution of mathematical anxiety to mathematical performance of children in primary schools change over time?
Caroline Ford, Gareth Williams, Andrew Dunn, Gary Jones, Nottingham Trent University

Objectives: Mathematical anxiety is a feeling of worry about dealing with mathematical problems in everyday and educational environments, which has been self-reported by children at very young ages. Mathematical skills are important for later school and life success. However relatively little is known about the long term consequences of early mathematical anxiety on future mathematical performance.

Design: According to the Processing Efficiency Theory (Eysenck & Calvo, 1992) anxiety reduces working memory capacity and hence performance. Since younger children have less well-developed working memory systems, than older children and adults, the effects of anxiety on performance are likely to be exacerbated.

Methods: We report on findings from a longitudinal research program exploring mathematical anxiety and performance in young children. The program tested children from year 1 and year 5 as they moved into year 2 and year 6 (N=136) in two primary schools, measuring aspects of cognitive ability (Reading, Non-verbal Intelligence and Working Memory) anxiety (Trait, State and Maths) and performance (Mathematical fluency, arithmetic and word problems).

Results: The findings indicated that although both groups reported elevated levels of mathematical anxiety, its relationship to performance depended on the type of mathematical tasks that children were asked to complete. The associations between performance and anxiety also changed over time for the two different groups.

Conclusions: This relationship between mathematical anxiety on mathematical performance in children over time is only recently being explored. We will discuss these findings in relations to Processing Efficiency Theory, mathematical anxiety around SATS and Key Stage 1 assessments, and general anxiety.

Ref: 1168 Empirical Oral Presentation
Exploring moral values in primary school children in UK (EU ETHIKA project)
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1Birmingham City University, 2University of East Anglia

Objectives: The primary objective of this paper is to report on findings from UK’s participation in the EU ETHIKA project. Current study’s aim was to explore primary school children’s understanding of moral values.

Design: A qualitative approach was adopted and research was carried out using focus groups which were designed and delivered by the group of the researchers in line with the principles of the EU project.

Methods: Primary school students from two age groups 7-9 and 9-11 years of age were recruited in the study. Focus groups’ discussions took place in their schools, usually in the library, where participants were escorted by their teacher and researcher. The materials consisted of stories and activities designed by ETHIKA on respect and happiness (7-9 age group, titled “The story of Fluffy”) and moral values (9-11 age group, titled “The dog and the wolf”). Grounded theory methodology was used in order to analyse children’s views and develop a theory grounded in the data collected.

Results: The core coding process brought into light the following themes: emotional competence, pro-social behaviour, morality/ moral values and social seeking in the 7-9 year group; and in the 9-11 group the first three themes were common with an additional (unique) fourth theme titled: self-reflection on actions, beliefs and behaviours. Primary school children are concerned about friendships, social relationships, moral values and ‘others’.

Conclusions: The results provide an insight into the conceptualisation of moral values. (The data collection is still in progress.)

Ref: 1300 Empirical Poster Presentation
Children’s subjective perception of mixed emotions: An adaption of the Analogue Emotions Scale (AES)
Francesca Fotheringham, Barbara Dritschel, Erin Robbins, University of St Andrews

Objectives: Explorations into children’s understanding of emotions have been previously analysed as sequential, without consideration for whether multiple emotions can be experienced simultaneously and across time. This study
aims to expand the developmental work of the Analogue Emotions Scale (AES), which has been used in adults to measure simultaneous perceptions of more than one emotion state. Objectives were to investigate the ability to perceive multiple emotions as well as whether there are developmental differences when children first identify emotions in themselves and someone else.

Design: Children were placed into one of three conditions where they were asked about the emotions of a protagonist (age-matched peer, adult, or self); in a 6 (age groups) x 3 (protagonist) design.

Methods: Participants (N=181) ranged in age from 4-10 years. The experimenter read a short vignette about moving house, where the protagonist is missing old friends, but making new ones. Children were asked to identify the emotions (classed broadly as negative and positive for purpose of analysis) felt by the protagonist throughout the story. Children plotted both the intensity and duration of each chosen emotion.

Results: Initial investigations show a significant association between age and the reporting of mixed versus single emotions, for the adult condition only $\chi^2(5)=13.176$, $p=.022$.

Conclusions: We conclude that developmental changes in the ability to report multiple emotions vary as a function of context.

Ref: 862 Empirical Oral Presentation
Children’s perceptions of other children’s humour styles
Claire Fox, Lucy James, Keele University

Objectives: The aim of the research was to assess children’s perceptions of other children using one of four humour styles (two are adaptive and two are maladaptive). Adults using the adaptive styles of humour have been found to be rated more positively compared to those using the maladaptive forms of humour. However, research of this nature is yet to consider younger children.

Design: A 2 (gender of humourist) x 2 (gender of participant) x 4 (humour style) fully unrelated design was used with participants were randomly allocated to conditions.

Methods: In total, 357 children (51% female) from 4 large primary schools in England were recruited. Participants were aged 9-11 years with a mean age of 10.08 years (SD = .70). Eight vignettes were developed to present children with a male or female child using one of the four humour styles (affiliative, self-enhancing, aggressive, self-defeating). Questions followed to assess participants’ thoughts and feelings about the target child.

Results: Children using aggressive humour were perceived the most negatively. However, there were some interactions with the gender of the participant and the gender of the target. For example, participants were less likely to want to play with a girl using self-defeating humour, in comparison to a boy.

Conclusions: These findings suggest that humour is an important interpersonal signal for children as well as adults. They will be discussed in relation to a second planned study which is considering the context in which the humour is used, i.e. the playground or the classroom.

Ref: 1302 Empirical Poster Presentation
The relationship between Executive Function skills and language development in toddlerhood
Elena Gandolfi, Paola Viterbori, Maria Carmen Usai, Chiara Malagoli, Department of Educational Science, University of Genoa, Genoa, Italy

Objectives: The study aimed to investigate the relationship between non-verbal emerging EF skills and language abilities in toddlerhood.

Design: This relationship was investigated by analysing the concurrent and longitudinal prediction of EF task scores on both lexical and grammatical language measures.

Methods: 62 typically developing children (Mage=28.40 months, S.D.=2.71) participated at Time 1 assessment and a subsample of 28 children (Mage =41.70 months, S.D.=2.05) was assessed one year later (Time 2). At Time 1 children were administered five EF tasks and a standardized Italian language test. Language abilities were also evaluated by a parent-report questionnaire. At Time 2 children were administered an Italian language test to assess the morphosyntactic receptive skills. A series of hierarchical multiple linear regression analysis (enter method) with language measures as dependent variables, were conducted to explore the contribution of age, mother education and EF
components on language measures. At time 2 also vocabulary size at Time 1 was entered as predictor of receptive morphosyntax.

**Results:** The results revealed that for all the language measures the EF scores accounted for an additional amount of variance ranging from 10% to 30%. In particular, Conflict Resolution EF score was a significant predictor of grammatical complexity \[t(4,48)=2.38, p=.02\], use of pronouns \[t(4,48)=2.25, p=.03\] and lexical production \[t(4,46)=2.54, p=.01\] measures at Time 1 as well as later receptive morpho-syntax total score \[t(5,20)=-2.38, p=.03\].

**Conclusions:** The current findings contributed to address some critical issue in this research area suggesting that selected EF skills play a role in supporting typical language acquisition from early stages.

Ref: 1131 Empirical Poster Presentation

Can group membership counteract envy?

Elena Gaviria, Laura Quintanilla, María José Navas, Spanish National University of Distance Education

**Objectives:** To analyse emotional and behavioural reactions of children when confronted with situations where both (envy-eliciting) upward comparison and group membership were made salient.

**Design:** Mixed experimental design. Within-subject factor consisted of two conditions of comparison: intergroup and mixed (intra-intergroup). Intergroup condition: participant belongs to a group which competes against another (fictitious) group and losses. Mixed condition: participant competes and losses within the ingroup to represent it in a competition against an outgroup. Between-subject factor was age.

**Methods:** 119 children aged between 6 and 11 years were individually interviewed at school. Using vignettes and questions, we obtained verbal responses referred to the emotional valence of reactions to success/failure and mishap of both winner character and participant. As a behavioural measure, participants allocated resources to characters involved in the stories, including themselves or their ingroup. All these responses were used to define three profiles: malicious envy, benign envy, and empathy.

**Results:** Malicious envy was significantly higher in the intergroup than in the mixed condition \((F(1,90)=32.2, p<.001, \eta^2_{p}=.26)\), while the reverse was true for empathic profile \((F(1,90)=14.87, p<.001, \eta^2_{p} =.14)\). Moreover, there was a decrease in malicious envy, and an increase in empathy as children grow up \((F(2,90)=7.15, p<.001, \eta^2_{p} =.137, F(2,90)=13.4, p<.001, \eta^2_{p} =.23)\).

**Conclusions:** Our results are in line with social identity theory and contribute to extend research on envy in children. In a social comparison situation, reacting in an envious or an empathic way seems to depend not only on interpersonal relationships between envier and envied, but also on group membership and identification.

Ref: 1279 Empirical Oral Presentation

The effectiveness of Brain Space spatial training videos to improve spatial and mathematical thinking in primary school children

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**Objectives:** This study investigates our novel Brain Space instructional videos as a means of training spatial skills in 6-8-year-olds, and explores transfer of spatial training gains to other spatial and mathematical domains.

**Design:** The effectiveness of training using instructional videos was compared to traditional spatial training (practice with feedback) and to a control condition (no spatial training). The instructional videos targeted mental rotation and spatial scaling, spatial skills that have been previously associated with mathematics achievement in childhood.

**Methods:** Participants (N =250) completed spatial and mathematics measures both pre, and immediately post-training. Tasks included: a spatial scaling task; a mental rotation task; and three mathematics tasks (a number-line estimation task; a geometry task; and a missing box calculation task).

**Results:** Instructional videos were associated with significant improvements in spatial performance compared to controls, i.e. video training in rotation and scaling led to significant gains in rotation and scaling accuracy respectively. Furthermore, video viewing in spatial scaling, improvements in mental rotation accuracy were also reported (intermediate transfer). For mathematics (far transfer), transfer of spatial training gains was specific to certain skills. That is, video training in mental rotation led to significant improvements on missing box problems,
while video training in spatial scaling led to significant gains on the geometry task, and significant error reduction in number line estimation.

**Conclusions:** Instructional videos offer a novel means of training spatial thinking, with knock on improvements for mathematics outcomes. These results also have implications for other Science, Technology, Engineering and Mathematics (STEM) domains.

Ref: 1262 Empirical Oral Presentation

**The effect of scepticism to advertising on children’s preferences to brands paired with celebrities.**

Hayley Gilman¹, Martin Rowley², Susan M Sherman²

¹Chester University, ²Keele University

**Objectives:** Research suggests that as children develop so too does their ability to identify the persuasive intent of advertising, but research examining the importance of scepticism is lacking. This study focuses upon pairing celebrities with brands, hypothesising that scepticism to ads increases with age leading younger children to prefer celebrity brands.

**Design:** The study used a 4 x 2 design, with age and presentation type (celebrity vs brand alone) as independent variables and scepticism and brand preferences as the dependent variables.

**Methods:** 216 children (aged 8-14 years, 102 female) participated so that the developmental nature of scepticism and advertising preferences could be explored. A printed questionnaire measured scepticism and ratings of brands presented either alone or with a celebrity. Analysis used ANOVAs and correlations.

**Results:** Results showed preference for brands presented alone $F(1,212) = 7.09, p = .008, \eta^2 = 0.03$, with overall brand preference decreasing with age, $F(3,212) = 10.46, p < .001, \eta^2 = 0.13$. Eight-year-olds were the least sceptical $F(3, 212) = 5.24, p = .002, \eta^2 = 0.07$. Correlational analysis showed children aged 12-14 years had negative relationships between celebrity paired brands and both scepticism before ($r = -.244, p < .05$) and after testing ($r = -.223, p < .05$).

**Conclusions:** Children prefer brands presented alone to celebrity paired brands. Scepticism could be important in influencing brand judgments, with children aged 12- and 14-years providing support for the notion that it could be around the age of 12-years when advertising is better understood by children.

Ref: 1259 Empirical Oral Presentation

**The effects of environment on creativity in 7 to 11 years-old children**

Erik Gustafsson, Bhagyashree Shah, University Of Portsmouth

**Objectives:** Among the factors affecting creativity, one is the environment. For instance, adult participants were found to be more creative in a disorderly environment compared to an orderly environment. In the same vein, the present study investigates whether children could be more creative in a less formal environment compared to a formal one.

**Design:** We used an independent groups design to separate participants into two different settings: the usual classroom and the less formal “art room”.

**Methods:** 111 pupils (7-11 years old) from a local school participated. All participants completed the Test for Creative Thinking – Drawing Production (TCT-DP), and the Guildford’s Alternative Uses Task.

**Results:** We found a significant effect of the environment, where those in the art room displayed higher levels of creative thinking than those in the classroom for the TCT-DP test ($F(1, 95) = 24.714, p < 0.001$). We found no significant difference between the rooms for the Guildford task. Interestingly girls were more creative than boys for flexibility ($F (1, 95) = 8.740, p = 0.004$), originality ($F (1, 95) = 4.183, p = 0.044$), and fluency ($F (1, 95) = 15.963, p < 0.001$) regardless the type of room.

**Conclusions:** This study confirm the role of environmental priming on creativity. Moreover, as higher creativity was observed in the art room for the drawing task only, future studies may look at the relationship between the environment and the modality used. Along with this, the causes of girls’ creativity may deserve more investigation.
Ref: 1221 Empirical Poster Presentation

Test-retest reliability of EEG connectivity measures in infants
Rianne Haartsen¹, Emily Jones¹, Bauke Van der Velde², Chantal Kemner², Mark Johnson³
¹Centre for Brain and Cognitive Development, ²Universiteit Utrecht, ³University of Cambridge

Objectives: EEG connectivity reflects how brain regions synchronise, and has gained increasing interest as potential biomarker in developmental disorders. Whether EEG connectivity can provide a stable measure for individual differences in infants however remains unclear. This study aimed to investigate test-retest reliability for a range of different connectivity metrics.

Design: Test-retest reliability was compared for EEG connectivity from 2 sessions with a 1-week interval in 42 10-month-old typically developing infants.

Methods: Infants watched videos during EEG recording. EEG alpha connectivity was calculated with the phase lag index (PLI) and the debiased weighted phase lag index (dbWPLI), for different combinations of epoch numbers (20-150 epochs), and durations (1-5 seconds). Intraclass correlations (ICC) were calculated for whole brain connectivity, and a local and global network measure.

Results: ICC values ranged from 0 to .87, showing increases with increasing amounts of data. ICC values were higher for the dbWPLI than the PLI when calculated across shorter epochs. When using a constant amount of data, short epochs provide more reliable results than long epochs. Finally, ICC values were highest for whole brain connectivity, intermediate for the local, and lowest for the global network measure.

Conclusions: It is appropriate to use the dbWPLI calculated across a high number of short epochs on infant data with only short episodes of artefact-free data typically available. Further, whole brain connectivity and the local network measure are suitable for inter-subject variability and correlational research, whereas these and the global network measure are suitable for group level research in infants.

Ref: 1268 Empirical Oral Presentation

Fiction reading experience predicts narrative production skills in 9- to 12-year-old children
Lorna Hamilton, Nicola Cutting, York St John University

Objectives: Print exposure predicts vocabulary and reading comprehension in middle childhood; less is known about how children’s reading habits relate to higher-level oral language skills. This study investigates the predictive role of fiction reading experience in 9- to 12-year-old children’s narrative production skills.

Design: We report cross-sectional data from an ongoing longitudinal study. Individual variation in narrative production was predicted in a series of regression models.

Methods: 125 children (mean age 10;6) were recruited via schools and advertisements. Fiction reading experience was assessed using an author recognition test, book recognition test, and self-report, which loaded onto a single factor. Narratives were elicited using a wordless picture book, and subsequently coded for eight variables (productivity, syntactic complexity, mean length of utterance, narrative cohesion, coherence, semantic score, mental state terms, false belief narration). Standardised measures of receptive vocabulary and word reading were included as covariates.

Results: Factor analysis of the narrative variables yielded two, correlated factors, representing (a) linguistic complexity and (b) semantic detail. Measures of coherence and false belief narration were analysed separately. Weak to moderate correlations were observed between fiction reading experience and the narrative dimensions (r=.24-.33). After controlling vocabulary and reading ability, fiction reading experience predicted a small amount of unique variance in: (a) the level of semantic detail in children’s narratives, and (b) false belief episode narration.

Conclusions: These findings suggest that children who read more fiction show advantages in certain narrative skills; specifically in measures that require inference of narrative detail, including characters’ mental states, from illustrations.
**Ref: 1184 Empirical Oral Presentation**

**Do children with autism have difficulty learning words from cross-situational statistics?**

Calum Hartley¹, Laura-Ashleigh Bird², Padraic Monaghan¹  
¹Lancaster University, ²Durham University

**Objectives:** Word learning is referentially ambiguous; there are often multiple potential targets for a newly-heard word. While typically developing (TD) children can accurately infer word meanings from cross-situational statistics, specific difficulties tracking word-object co-occurrences may contribute to language impairments in autism spectrum disorder (ASD).

**Design:** Here we explore cross-situational word learning in language-delayed children with ASD. Participants completed a tablet-based cross-situational word learning task that assessed mapping, retention, and generalisation of new words.

**Methods:** Participants were 15 children with ASD (M age: 8.78 years) and 16 TD children (M age: 5.52 years) matched on receptive vocabulary (ASD M: 5.35 years; TD M: 5.84 years). Over 48 learning trials, children viewed pairs of unfamiliar objects and were instructed to identify referents for six novel words. Correct word-object pairings could only be disambiguated based on cross-trial statistics. Children’s retention and generalisation of the novel words were assessed after a 5-minute delay.

**Results:** Both groups achieved similar overall accuracy in the learning trials (ASD: 68.06%; TD: 70.45%) and responded more accurately in trials 25-48 than 1-24 (Z = 3.12, p = .002). The two groups also performed similarly on delayed retention (ASD: 64.44%; TD: 62.50%) and generalisation (ASD: 64.44%; TD: 65.10%) test trials.

**Conclusions:** Cross-situational word learning in language-delayed children with ASD is unimpaired in comparison to vocabulary-matched TD controls. Both groups successfully identified, retained, and generalised novel word meanings from statistical associations alone. Thus, delayed language development in ASD may not be attributable to difficulties tracking word-referent co-occurrences over time.

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**Ref: 1137 Empirical Oral Presentation**

**Do children with autism share fairly and reciprocally?**

Calum Hartley¹, Sophie Fisher²  
¹Lancaster University, ²Axcis Education

**Objectives:** This study investigated whether children with autism spectrum disorder (ASD) and typically developing (TD) children share resources reciprocally. As preferences for “fairness” are driven by social norms and awareness of others’ perspectives, we predicted that ASD would impact children’s sharing behaviour.

**Design:** Participants completed age-appropriate versions of the Ultimatum Game (UG) and Dictator Game (DG) – widely-used tasks in behavioural-economics.

**Methods:** Participants were 15 children with ASD (M age: 9.2 years) and 18 TD children (M age: 4.3 years) matched on language comprehension (ASD M: 5.1 years; TD M: 4.83 years). On different days, children played the UG and DG, trading stickers with a puppet. Each game involved two roles: proposer and recipient (players alternated roles for 4 turns). In the UG, recipients could accept or reject the proposer’s offer. In the DG, the recipient always had to accept.

**Results:** Both groups made similar average offers in the UG (ASD: 41.4%; TD: 42.38%) and DG (ASD: 34.63%; TD: 34.38%). However, children with ASD were more likely to accept unfair offers than TD children (40% vs 11%; χ² = 3.77, p = .05) and reciprocated fair offers at much lower rates in both the UG (ASD: 56%; TD: 93%) and DG (ASD: 50%; TD: 75%).

**Conclusions:** Although both groups’ average offers were similar, ASD impacted children’s ability to evaluate the fairness of others’ offers and to reciprocate accordingly. Reduced reciprocation of others’ fair behaviour could elicit negative affect in peers, while higher tolerance of unfair behaviour could increase susceptibility to bullying.
**Ref: 1207 Symposium**

(S) The Development of Imagination in Childhood

Dale Hay, *Cardiff University*

**Symposium summary**

Imagination is defined as ‘the power or capacity to form internal images or ideas of objects and situations not actually present to the senses’ (Oxford English Dictionary, online). Cognitive scientists currently regard imagination as a multi-faceted mental process incorporating phenomena such as scene construction and mental time travel, closely related to episodic memory and linked to other internal modes of cognition, e.g., social cognition and moral decision-making. Yet how do these multifaceted skills develop? To study the development of imagination, it is necessary to measure different dimensions of imaginative activities over time. It is also important to examine individual differences in children’s imaginative skills in representative populations. The aim of our symposium is to present findings about children’s imaginative abilities within a developmental framework, focusing on (1) the origins of imagination in the first two years of life, (2) engagement in imaginative play in real and virtual environments and (3) imaginative abilities in children who have been referred for autism and other developmental problems. In these studies we are particularly interested in associations between imagination and social understanding. Two of the papers draw on data from the Cardiff Child Development Study, a longitudinal study of a nationally representative British sample; the third reports findings from the SIGNS project, a screening study of school children’s possible developmental problems. Professor Leekam will discuss the evidence presented in terms of current theories of social cognitive development.

**Ref: 1219 Empirical Oral Presentation**

**Paper 1 - The origins of imagination in the first two years of life**

Charlotte Robinson, Dale Hay, *Cardiff University*

**Objectives:** Pretend play is seen as a universal milestone, with the first examples generally thought to emerge between 18 and 24 months of age. The current study tested whether most children in a nationally representative community sample of children aged 17-29 months engaged in pretend play. Informants’ reports were compared to observational data.

**Design:** The investigation was carried out in the context of a prospective longitudinal study of children and their families.

**Methods:** Questionnaire data on children’s pretend play from up to three informants were provided by 256 families. Of those, 180 children were additionally observed during a home visit at a mean age of 20.5 months (SD=2.2); pretend play was recorded during a twenty-minute free play activity with a familiar child using a coding scheme that distinguished playful pretence from other ways of exploring objects.

**Results:** Of the 180 children, 151 (84%) were reported to engage in pretend play by informants. During the observation period, 67 (37%) children demonstrated at least one instance of pretend play. The informants’ reports were significantly correlated with observed pretend play.

**Conclusions:** In this community sample, pretend play was not reported for all participants in the age range. Further, while there was agreement between informants and direct observations, a single observation session might underestimate children’s capacity for pretend play. These findings have implications for the use of pretend play tasks for the early screening of developmental delays and disorders.

**Ref: 1212 Empirical Oral Presentation**

**Paper 2 - Exploring children’s use of internal state language in virtual and non-virtual play activities.**

Salim Hashmi, Dale Hay, *Cardiff University*

**Objectives:** Within pretend play activities, children use narratives to explore the inner states of fictional characters (Scarlett & Wolf, 1979). Internal state language (ISL) refers to terms used to refer to the thoughts, feelings and desires of individuals (Bretherton & Beegly, 1982). However, there has been a paucity of research investigating children’s use of ISL when they engage in play in ways other than creating narratives, and within virtual environments. The present study aimed (1) to explore children’s use of ISL in virtual and non-virtual play contexts,
and (2) to investigate whether the use of ISL differed according to how children engaged with the play activities.

**Methods**: This was done in the context of a sample of 272 children who took part in a prospective longitudinal study at a mean age of 7. Children’s style of engagement with the free play activity, immersion within the video game, and references to internal states were coded from transcripts of their speech and behaviour.

**Results**: During the free play activity, children were more likely to refer to the internal states of the fictional characters when they engaged in the play by enacting roles ($r = .25$) or telling stories ($r = .35$). Similarly, children were considered as being more immersed in the video game when they referred to the internal states of the virtual characters.

**Conclusions**: The findings suggest that children’s references to the internal states of fictional characters within two play contexts differed according to the way in which they engaged with the activity.

Ref: 1298 Empirical Oral Presentation

**Paper 3 - Patterns of pretend play in children with and without autism spectrum disorder**

Sarah Barrett, Dale Hay, Sue Leekam, *Cardiff University*

**Objectives**: Difficulty with pretend play is included within the diagnostic criteria for autism spectrum disorder, but research on pretend play in autism has tended to use observational methods. The aim of the current analysis is to explore the quality and patterns of everyday pretend play in children with and without autism according to parent report.

**Design**: A cross-sectional online survey study.

**Methods**: Parents of children aged between 5 and 11 years old (N=183), recruited through schools and social media, completed an online questionnaire. The questionnaire measured traits and symptoms derived from a diagnostic interview (e.g. Leekam et al., 2002) and items from the National Institute for Clinical Excellence guidelines for autism.

**Results**: The final sample comprised 183 children (139 male) aged between 5-11 years (mean=97.25 months, SD=22.94). Ninety-five children had existing diagnoses of autism and 42 had diagnoses of other developmental or psychological disorders. Presence of pretend play was reported in 78% of autistic children, 86% of children with other diagnoses and 94% of children with no diagnosis.

For all three groups, at least 90% of participants endorsed one of the following qualities of pretend play: not sharing ideas, repetitive themes and solitary play. The most frequently occurring configuration was endorsement of all three (Autism: 63.5%; Other: 44.4%; No diagnosis: 20.9%).

**Conclusions**: The majority of autistic children displayed pretend play behaviours. The patterns of pretend play difficulties were similar across groups, but more pronounced in the clinical groups. Cluster analysis will be used to further explore patterns of pretend play.

Ref: 1294 Empirical Oral Presentation

**Adolescent perceptions of the risks and benefits of social networking site use.**

Beatrice Hayes¹, Dawn Watling¹, Alana James², Ravinder Barn¹

¹Royal Holloway, University of London, ²University of Reading

**Objectives**: 76% of adolescents reported using social networking sites (SNS; Ofcom, 2017). The media often hypes the negative impact of SNS use, yet little is known about how adolescents themselves perceive the risks and benefits. Adolescents are spending increasingly more time on SNS, and research has shown that the more time spent online the greater the possibility of exposure to the risks (e.g., cyber bullying, loneliness). In this study we aim to gain an understanding of adolescents’ perceptions of the risks and benefits of SNS use.

**Design**: A questionnaire was administered online via Qualtrics, to allow participants to respond anonymously.

**Methods**: To date, 277 participants aged between 13 to 18 years (M= 14.45) were recruited from local secondary schools to complete two scales. The first scale was adapted from an online privacy attitude scale (Buchanan et al, 2007) to assess risk perceptions of privacy, over-disclosure, and addiction. Participants responded using a 5-point Likert scale. The second scale consisted of both positive and negative items that have been related to potential risks and benefits in the literature; participants sorted the statements according to their perceptions of which were risks,
benefits, or both.

**Results**: Findings indicate that participants perceived few risks overall, but were more likely to perceive privacy-related items (behaviours) as risky compared with those related to over-disclosure and addiction.

**Conclusions**: These findings will be discussed with regards to adolescents’ insights into the risks of social media and the implications for SNS training.

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**Ref: 1133 Empirical Poster Presentation**

**The Development of Cognitive Control and Preventing Attentional-Capture**

Rumandeep Hayre, Harriet Allen, Lucy Cragg, *University of Nottingham*

**Objectives**: Cognitive control prevents attentional-capture by distractions, by planning-ahead (proactive control) or acting in-the-moment (reactive control). It is unclear at what age proactive control is used and whether this form of control is beneficial to younger children who are beginning to use this skill.

**Design**: Five-, 7-, 9- and 10-year-olds completed one of three cued visual-search tasks. Cue-predictiveness was manipulated between blocks of trials to encourage proactive (Mostly-Predictive block; most trials had predictive cues), reactive (Mostly-Unpredictive block; most trials had unpredictable cues) or baseline (Neutral cues throughout) responding. A singleton-distractor was presented on one-third of trials to measure attentional-capture.

**Methods**: 72 participants were recruited from the University of Nottingham Summer Scientist Week event. Median-RTs were analysed using a 2 (trial-type: predictive, unpredictive cue) x 2 (distracter-presence) x 3 (task-block: Mostly-Predictive, Mostly-Unpredictive, Neutral) x 4 (age-group) mixed-ANOVA.

**Results**: A significant four-way interaction was found (F(6,57)=5.14, p<0.001). ANOVAs for each age-group showed five-year-olds were faster on distracter-absent, compared to distracter-present trials when the cue was predictive in Mostly-Predictive (p<0.05), but not in Mostly-Unpredictive task-blocks (p>0.05). Ten-year-olds were faster on distracter-absent, compared to distracter-present trials, in Mostly-Unpredictive (p<0.001) and Neutral (p=0.045), but not in Mostly-Predictive task-blocks (p>0.05).

**Conclusions**: The findings show that it was not until age ten that attentional-capture was successfully prevented by encouraging proactive control. Five-year-olds ignored the singleton-distracter only when presented with unpredictable cues/contexts. This suggests five-year-olds benefit from using a less-demanding reactive strategy, as their cognitive capacities have not yet developed to engage a resource-demanding skill like proactive control.

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**Ref: 1213 Review/ Theoretical & Practice Oral Presentation**

**Issues of power and precision in developmental disorders research**

Hannah Hobson, *University of Greenwich*

**Purpose**: The purpose of this review is to examine the statistical power and precision achieved by research into developmental disorders.

**Background**: Issues of reproducibility and reliability have been a hot topic in psychology and neuroscience over the last decade. While specific fields such as neuroimaging (e.g. Poldrack et al., 2017) and social psychology (e.g. Earp & Trafigrim, 2015) have received specific attention, little has been published in relation to developmental psychology. Nonetheless, developmental psychology, and the study of developmental disorder in particular, is a field that is arguably likely to suffer from issues of reproducibility, due to generally quite small samples sizes and large heterogeneity, both of which will impact negatively upon a study’s power.

**Methods**: Web of Science searches were conducted for meta-analyses on ASD, developmental language disorder (Specific Language Impairment) and ADHD. Inclusion criteria were that the review had been published in 2005 or later, included at least 13 studies, was psychology focused (rather than health) and was not primarily concerned with interventions. From these criteria, 48 meta-analyses were identified as appropriate. Post-hoc power and the precision of the effect size were calculated for the included individual studies.

**Conclusions**: Power across these studies often did not meet the generally desired 0.8 level. Confidence intervals surrounding effect sizes also showed that many studies lacked precision. These analyses highlight the need for more open discussion about what developmental psychologists can and should do to improve the reproducibility of their research.
Emotional Language in People with Williams Syndrome
Ching-fen Hsu, Department of Foreign Languages and Literature

Objectives: Emotion recognition requires configural perception and social cues. People with Williams syndrome (WS) are impaired in global perception but hypersocial in personality. This study aimed at investigating the ability to understand emotions through linguistic events and words in people with WS.

Design: Ratings were conducted to select targets of each emotion (positive, negative, neutral), which were orally presented to participants with WS and individually matched controls (mental ages [MA], chronological ages [CA]).

Methods: Participants were asked to press buttons indexing emotions in reaction to targets. The correct responses and reaction times were subjected into analyses.

Results: The results showed that people with WS were similar to CA controls in accuracy to positive events, delayed to negative events as MA controls, and deviant to neutral events. In reaction times, the clinical individuals responded to positive events as MA group, but they responded to negative and neutral events with longest time. Furthermore, no interaction was observed in accuracy to emotional words between people with WS and control groups. Response latencies to positive and negative words in people with WS were not different from MA, but the reaction times to neutral words were the longest among groups.

Conclusions: The findings indicated delayed and deviant developments in emotional language in people with WS. The MA group showed lower accuracy to negative events and longer responses to negative and neutral events compared to the CA group, indicating development of emotion knowledge through linguistic expressions takes time. Possible causes of difficulties in emotional processing of people with WS are discussed.

Perinatal experiences and wellbeing in the New Fathers and Mothers Study
Claire Hughes, University of Cambridge Centre for Family Research

Symposium summary
In this symposium we report early findings from an ongoing international study of 858 first-time parents and their infants, recruited across three sites: UK, USA and the Netherlands: the New Fathers and Mothers Study (NewFAMS). The papers adopt different methodologies and foci to address the common theme of parent / infant wellbeing.

In paper 1, transcripts of UK expectant parents’ descriptions of their unborn child were coded for narrative coherence, which was reduced in fathers reporting low couple relationship quality.

In paper 2, 402 UK mothers’ and fathers’ ratings of the birth experience at 4-months showed unique associations with wellbeing, even controlling for the stability of individual differences.

In paper 3, maternal reports of infant sleep were associated with ratings of infant exposure to screens at 4-months.

In paper 4, 176 UK parents used automated ‘talk pedometers’ to code 16-hour samples of talk at 7-months: interaction effects between maternal and paternal ratings of couple relationship quality highlight the importance of gathering information from fathers as well as mothers.

Together, these findings highlight the importance of including:
1. Fathers as research participants in order to obtain a family systems perspective on infants’ early lives
2. Fathers’ reports of birth experiences, which were as strongly associated with well- as for mothers
3. Measures of couple relationship quality, which appears associated with expectant fathers’ talk about their infants and with mothers’ and infant talk at 7-months
4. Measures of modern-day family life (e.g., screen-time, which appears related to sleep duration for 4-month-old infants).
Paper 1 - Spill-over in Pregnancy? Couple Dissatisfaction Predicts Reduced Coherence in Fathers' Descriptions of Their Unborn Child
Sarah Foley, Anja Lindberg, Claire Hughes, Centre for Family Research, University of Cambridge

Objectives: Building on reports that parental narrative coherence predicts positive adjustment in pre-schoolers, in this study we aimed to:
• Adapt the Narrative Coherence coding scheme for use in a prenatal context;
• Compare and contrast the ability of expectant mothers and fathers to construct a coherent narrative of their unborn infant;
• Examine links with mental health and couple relationship quality.

Design: During pregnancy 402 first-time parents (201 mothers and 201 fathers) were recruited to take part in a longitudinal study of the transition to parenthood.

Methods: Five-minute speech samples from 402 first-time expectant mothers and fathers (i.e., the UK sample of the New Fathers and Mothers Study) were coded for narrative coherence (i.e., balance, warmth). Online questionnaires were used to gather self-reported wellbeing and couple relationship quality. Actor-Partner Interdependence Model (APIM), were used to test for the presence of actor (intra) versus partner (interpersonal) effects.

Results: Most expectant mothers and fathers struggled to provide a coherent description of their unborn baby and narrative coherence was unrelated to demographic characteristics, mental health or partner coherence. However, poor coherence in fathers was associated with poor couple relationship quality.

Conclusions: Fathers’ parenting may be particularly susceptible to influence even prior to the arrival of the child. Interventions to improve couple relationship may have greater impact if they begin during pregnancy.

Ref: 1203 Empirical Oral Presentation
Paper 2 - Worrying in the Wings: Mothers’ and Fathers’ Negative Emotional Memories of Birth are Related to Perinatal Mood Disturbance
Claire Hughes1, Sarah Foley2, Rory Devine2
1University of Cambridge Centre for Family Research, 2University of Birmingham School of Psychology

Objectives: In this study we aimed to:
1. Compare and contrast new mothers’ and fathers’ emotional birth memories at 4-months.
2. Document initial levels / changes in wellbeing across a 25-month period for both parents.
3. Examine links between birth memories and prior / later reports of wellbeing for both parents.

Design: Our study encompassed four time-points and controlled for parity and prior wellbeing by recruiting expectant first-time parents.

Methods: In the UK arm of the New Fathers and Mothers Study, just under 200 couples expecting their first baby were recruited (primarily via 20-week ultrasound clinics) and visited in the third trimester and at 4, 14 and 24 months. Conceptual equivalence of measures across parent gender / time-point was established by testing measurement invariance (MI). Parental wellbeing trajectories were examined using Latent Growth Models (LGM). Links between negative birth experiences and wellbeing were examined using autoregressive models to control for the stability of individual differences.

Results: Latent variables for symptoms of depression and anxiety showed strict MI between parents and over time. For both parents, there was significant variability in initial levels of wellbeing and variability in birth memories was associated with both prenatal and 4-month wellbeing. In addition, fathers’ slopes showed significant variability (more negative trajectories for younger fathers) and a fathers’ birth memories were marginal associated with wellbeing at 24 months.

Conclusions: Our findings highlight the need to gather information about prenatal wellbeing and negative birth experiences from both mothers and fathers.
Ref: 1208 Empirical Oral Presentation
Paper 3 - Why won’t she sleep? Screen exposure and sleep patterns in 4-month-old infants
Gabrielle McHarg1, Andrew Ribner2
1University of Cambridge, 2New York University

Objectives: Few things are more vital to a child’s development than sleep. Unfortunately, a number of characteristics of the developing infant’s environment are negatively associated with sleep duration. In this study, we investigate whether electronic screen-based media exposure prior to 6 months of age may disrupt natural sleep patterns.

Design: Families (N = 429) were recruited from hospitals and classes in the US, UK, and the Netherlands in the early stages of the New Fathers and Mothers Study. Data were collected when infants were 4 months of age.

Methods: Mothers reported how much time their infants spent viewing screens. They also reported amount of daytime and night-time sleep. Child temperament, maternal sleep duration, work, general wellbeing, depression, and anxiety, and family income were analysed as co-variates.

Results: Over and above a host of maternal, child, and family characteristics, exposure to electronic screen-based media was negatively associated with night-time (but not daytime) sleep in all three countries, b = -0.21, p = .001.

Conclusions: Increased exposure to electronic screen-based media was associated with a decrease in night-time sleep, such that an hour of screen time was associated with nearly 13 minutes less sleep on a typical night. While these findings do not demonstrate causal direction, they are consistent with recommendations that screen time should be minimised for infants.

Ref: 1217 Empirical Oral Presentation
Paper 4 - Parent wellbeing, infant conversation: The association between couple satisfaction and conversational turns in the family home
Elian Fink, Isla Kirk, Wendy Browne, Claire Hughes, University of Cambridge

Objectives: In this study we aimed to:
1. Explore the frequency of mother-, father- and infant-initiated conversations across a full day using a new recoding method
2. Compare the frequency of family (mother-, father- and infant-initiated) conversations for couples with low and high couple dissatisfaction
3. Examine the interactive effect of mother and father couple dissatisfaction on the frequency of family conversation

Design: This study assessed couple satisfaction at when infants were 4 months old, and used an automated system to collect information about family conversation at 7 months.

Methods: 88 families (including 69 families from the NewFAMS study) were recruited to participate at 4 months to provide information about couple satisfaction and conflict, and at 7 months (Mage = 6.95 months, 45 male) infants wore a talk pedometer for 16 hours to derive the number of mother-, father- and infant-initiated contingent conversations.

Results: As expected, mother-initiated conversations with infants were more frequent than father-initiated conversations. Couples in the bottom quartile for couple relationship quality did not differ in total mother- father- or infant-initiated talk. If either parent reported low couple satisfaction the frequency of mother-initiated talk was increased. However, when both parents reported low couple satisfaction the frequencies of both mother-initiated and infant-initiated talk were reduced. Father-initiated talk did not vary with couple satisfaction.

Conclusions: These interaction effects highlight the importance of accounting for both mother and father couple satisfaction in order to fully understand the dynamics of early family conversation.

JSDP Award Winner
Development of children’s flexibility in their deception and moral judgment
Dr Hajimu Hayashi, Kobe University, Japan

Young children already have considerable social capacity. Around the age of 4 to 5 years, they can selectively deceive enemies and give accurate information to friends. They also evaluate behaviour based on mental states such as intention. However, their deception and moral judgments are still inflexible. For example, if young children face a
situation where both an enemy and a friend are present, indicating a conflict between deceiving the enemy and telling the truth to the friend, they cannot control their behaviour by such means as withholding information or speaking it in a whisper to prevent the enemy from hearing the truth. However, children begin to show such flexibility during the elementary school years. They understand that people selectively conceal or express emotion depending upon the context around 8 to 9 years. They can also make appropriate moral judgments related to the understanding of mental states such as knowledge or ignorance, similar to normal adults. These abilities reflect their development of a second-order theory of mind. This talk presents a series of experiments on deception and moral judgment and discusses young children’s limitations and elementary school children’s flexibility; it also demonstrates how children’s lying and moral judgments are connected and essential for developing their social cognition.

Ref: 1320 Empirical Oral Presentation
Complex mental state and basic emotion recognition in dynamic film: An exploration of Theory of Mind understanding in ASD
Hayley Hunt, Elisa Back, Jo Van Herwegen, Kingston University

Objectives: Attention to social information has been reported as impaired in those with Autism Spectrum Disorder (ASD). Explanations for this range from perceptions of restricted interests causing fixed viewing strategies or restrictions of local rather than global visual processing styles. This research aimed to investigate attention to dynamic scenes with varying levels of social information. Expectations were that viewing strategies of participants with ASD would be restricted with increasing difficulties as social information increased and they would have more interest in non-social information.

Methods: 35 participants with ASD (7 - 18 year olds) were matched to 34 typically developing (TD) peers on Chronological Age and IQ using the WASI. ASD diagnosis was re-confirmed using the ADOS-2. Scenes from the 2011 silent film “The Artist” were presented in a free view condition with three levels: Highly social background, moderately social background and no social background. Eye movements of ASD children and adolescents were compared to TD children and adolescents using the Tobii T120 eye-tracker and measures included fixation count and fixation duration to areas of interest.

Results: Results showed no significance between ASD and TD groups for fixation duration or fixation count when viewing foreground and background social information. Analyses were also carried out investigating the interaction between group and levels of social background.

Conclusions: Findings inform us about the viewing strategies of ASD and TD children and adolescents with implications regarding their attention to varying levels of dynamic social information will be discussed.

Ref: 932 Empirical Poster Presentation
The relationship between children’s scale errors and categorization
Mikako Ishibashi1, Katherine Twomey2, Gert Westermann3
1Ochanomizu University, 2Manchester University, 3Lancaster University

Objectives: Early in development, young children sometimes attempt to perform impossible actions on miniature objects. Studies suggest that this scale error may stem from immaturity in children’s category representations. Here, we aimed to directly examine the relationship between children’s scale error and their categorization ability.

Design / Methods: 48 18- to 24-month-old children completed a scale error task, first playing with life-size toys, then miniature replicas of these objects, and their scale errors were recorded. Next, in a screen-based categorization task, children were familiarized with individual images from a novel animal category. Three test trials consisted of two novel images: out-of-category and prototypical to the familiarized category (Out/Prot), out-of-category and peripheral to the familiarized category (Out/Periph), and prototypical and one peripheral (Prot/Periph). Looking preference to the out-of-category (in the Out/Prot and Out/Periph pairings) or to the peripheral image (in the Prot/Periph pairing) served as an index of categorization.

Results: Fifteen children made scale errors. Whether children made a scale error was related to their categorization ability: on all test trials, children who preferred the out-of-category or peripheral stimulus were less likely to show a scale error (all b < -1.34, p < .001). Thus, children with better categorization ability were less likely to show the scale error.
**Conclusions:** Our results suggest that the scale error may reflect children’s developing categorization ability, offering the first empirical evidence for a link between children’s scale error and their early representational development.

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**Ref: 1162 Empirical Poster Presentation**  
**The effects of eye contact on infant heart rate: A study in the context of gaze following**  
Mitsuhiko Ishikawa, Shoji Itakura, Kyoto University

**Objectives:** It has been argued that eye contact affects infant social cognition. According to the Natural Pedagogy theory, eye contact is one of the most important communicative cues and promotes infant gaze following. There are many suggestions how eye contact affects infant and why eye contact induce gaze following behaviour. Here, we examined the heart rate variability during infants making eye contact with others in the gaze following context.

**Design:** We created 3 video conditions, Eye Contact, No Eye Contact and Shivering before an actor directs her gaze towards an object.

**Methods:** Currently, ten infants between 9 to 10-month olds participated in this study. Participants watched video presentation of an actor gazing toward one of two objects after eye contact or without communicative intent. We measured heart rate during watching video, and infants' gaze following behaviour was recorded with eye-tracking techniques.

**Results:** As a result, infants showed gaze following (85%) only after eye contact with an actor above the chance level (50%). Also, compared with the baseline (127.83 beat per minute), heart rate was accelerated during infant making eye contact (129.15 beat per minute).

**Conclusions:** From these results, it can be considered that eye contact may increase infant heart rate quickly, and such physiological changes would be highly related with gaze following behaviour. Previous studies showed that very short presentation of direct gaze even promotes infant gaze following. Therefore, the promotive effects of eye contact on infant gaze following could be unconscious processing and it may be observed as physiological change.

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**Ref: 1239 Empirical Poster Presentation**  
**Facial Emotion Recognition across age groups**  
Asiya Jaffrani¹, Charlotte Roche¹, Kathryn Parkin¹, Hiromi Tsuji², Peter Mitchell¹  
¹University of Nottingham, ²Osaka Shoin University

**Objectives:** The purpose of the current research was to investigate how facial emotion recognition differs across age groups. Meta-analysis of 28 studies suggest a decline in the ability to recognise emotions of anger, sadness, fear, surprise and happiness with age (Ruffman et al., 2008). The current study used natural dynamic expressions instead of static or posed images used in previous studies.

**Design:** A mixed-subjects design.

**Methods:** Eighteen children, 20 young adults and 20 elderly viewed 64 video clips in 3 blocks. The video clips were natural expressions of happy, sad, angry and grateful. The participants were asked to guess the expression from choices given.

**Results:** Expressions of sad and grateful were similarly recognised across age groups. However, angry was better recognised by the elderly than other groups and happy was better recognised by the elderly than young adults. With regards to differences in accuracy across emotions, in young adults and elderly, the angry expression was better recognised than sad and grateful and the happy expression was better recognised than grateful. The happy expression was also better recognised than sad, but this was only found in elderly group. There was no difference in accuracy level across the emotion in children.

**Conclusions:** Contrary to previous studies the elderly are better at recognising anger and happiness than other age groups. In addition, this study found that the angry expression is better recognised in the adult population. This results suggest that the ability to recognice emotions differ across age groups. However, this also depends on the type of emotion.
Ref: 1177 Empirical Oral Presentation
Humour styles and empathy in junior school children
Lucy Amelia James, Caitlin Charlotte Halfpenny, Keele University

Objectives: The appropriate use of humour is perhaps dependent on how a humourist relates to, understands and can empathise with their audience. Previous research has found associations between both adaptive and maladaptive humour styles and empathy in adults. Research investigating humour styles in children however, is limited. Thus, the present research aimed to determine whether empathy is related to junior-school children’s use of different humour styles. It was hypothesised that empathy would be positively related to children’s use of adaptive humour styles and negatively related to children’s use of maladaptive humour styles.

Design: As appropriate measures of humour styles for younger age groups are now available including the Humour Styles Questionnaire for Younger Children (HSQ-Y), a survey design was utilised.

Methods: The HSQ-Y and The Thinking and Feeling Questionnaire, which measures affective empathy, cognitive empathy and sympathy, was administered to 214 UK children aged 9-11 years old.

Results: Correlational analyses showed that self-enhancing humour was positively associated with both types of empathy and sympathy, whilst affiliative humour was positively associated with cognitive empathy only. Aggressive humour was negatively associated with affective empathy and sympathy.

Conclusions: In support of research with adults, this study highlighted important links between empathy and children’s use of adaptive and maladaptive styles of humour. This further emphasises the important role humour may play in terms of children’s adjustment.

Ref: 1282 Empirical Oral Presentation
The Role of British and Chinese Cultures in the Development of Expressive Drawing
Richard Jolley1, Sarah Rose1, Zhi Zhang2
1Staffordshire University, 2Yunnan Normal University

Objectives: To examine the extent to which Western and Chinese cultural variations are evident in the quality of expressive drawings, and whether such variations are moderated by the (Western and Chinese) culture of the artistic experts judging the drawings.

Design: The independent variables were age group of participant (4-year-olds, 7-year-olds, 11-year-olds, 14-year-olds, 14-yr-olds artists, adults and adult artists), culture of participant (British or Chinese) and mood of drawing (happy, sad and angry). British artists’ and Chinese artists’ ratings were analysed separately and comparatively to assess the development of the expressive drawing of mood (dependent measure).

Methods: 420 children and adults native to Britain (210) and China (210) were asked to draw a happy, sad and angry picture. Pairs of British and Chinese artists independently rated the drawings on a 7-point scale of aesthetic merit of expression.

Results: Data were analysed using a combination of ANOVAs and trend analyses. Both pairs of British and Chinese artists rated the British and Chinese expressive drawings to be of similar aesthetic merit. However, the developmental patterns observed by the British and Chinese artist judges were different. British artists’ ratings indicated age incremental patterns whereas Chinese artists’ ratings indicated disparate patterns for the different moods.

Conclusions: British and Chinese expressive drawing from preschool to adult artists is judged to be of similar aesthetic merit irrespective of the respective cultural art values and traditions upon which the drawings are judged. Nevertheless, the cultural art values do affect the nature of the developmental progression observed.
Ref: 1310 Empirical Poster Presentation

A qualitative inquiry into teacher-student relationship from the attachment perspective
Dana Jušová¹, Tomáš Weber¹, Lenka Lacinová¹
¹Masaryk University, Institute for Research on Children, Youth, and Family, Czech Republic, ²Masaryk University, Czech Republic

Objectives: When applying an attachment perspective to teacher-student relationships, it is not clear whether a teacher can be considered an attachment figure. Researchers agree that the teacher may play the role of secure base and safe haven. However, some of them point out that this relationship is not a full-fledged attachment relationship. We aim to understand how the functions of attachment manifest themselves in the teacher-student relationship from the perspective of adolescents.

Methods: The sample consists of 9 adolescents (aged 14-15 years). They participated in a study of 215 Czech adolescents (comprising four cohorts, aged 12-18 years) which explored their development of attachment hierarchy. We asked all participants whether they were close to their class teacher and whether they were willing to talk about their relationship with us. Twenty students met both these conditions and we focused on the cohort of 9th graders. In December 2017 the cohort of 9th graders (n = 72) filled questionnaires about trust in their parents, friends and class teacher. In addition, Strengths and Difficulties Questionnaire was administered to their class teachers.

Results: The semi-structured interviews are expected to conclude in June 2018. A thematic analysis procedure will be applied as the analytical method. The findings will be completed with the results of a quantitative analysis which compared the 9 adolescents with their same-age peers in variables mentioned above.

Ref: 1236 Review/ Theoretical & Practice Poster Presentation

How Parents Understand Autism: an Individualised Autism Profiling Tool for Children and Young Adults
Alexandra Karousi, Simon Bignell, Christopher Barnes, Sigrid Lipka, University of Derby

Purpose: The National Autistic Society (NAS) report that while the vast majority of people have heard of Autism, very few show a detailed understanding of it. Here we outline the rationale for and development and validation of an Individualised Autism Profiler (IAP) for people with autism, their parents, carers and professionals.

Background: Early diagnosis is vital for children with autism and their families in order to facilitate earlier intervention and appropriate support services. However, the generic understanding of autism acquired by popularised archetypes and media portrayals may be detrimental to parents, as it often does not map to their experience of their own child. A community need exists for a practical, evidence-based tool that can bridge the gap between diagnostic clinical descriptors and unique child’s characteristics. The Early Childhood Outcomes (ECO) framework provides a theoretical and contextual setting for this work in relation to Family Interaction, Parenting and Wellbeing. The proposed IAP will provide a dynamic and accessible outline of the child’s strengths and difficulties.

Methods: Initially, we will assess 160 parents of children with autism via an online Likert-scale survey to investigate parental understanding of autism. Follow-on, six parents that completed the survey will be randomly selected and interviewed to support the interpretation of the quantitative data from the online survey.

Conclusions: Currently, an individualised tool such as this is absent from the published literature and will add vital evidenced-based utility and accessibility for parents and professionals across educational, home and clinical settings.

Ref: 1234 Review/ Theoretical & Practice Oral Presentation

Investigation into Parental Understanding of Autism via an Individualised Autism Profiler (IAP)
Alexandra Karousi, Simon Bignell, Christopher Barnes, Sigrid Lipka, University of Derby

Purpose: The National Autistic Society (NAS) report that while the vast majority of people have heard of Autism, very few show a detailed understanding of it. Here we outline the rationale for and development and validation of an Individualised Autism Profiler (IAP) for people with autism, their parents, carers and professionals.

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between diagnostic clinical descriptors and unique child’s characteristics. The Early Childhood Outcomes (ECO) framework provides a theoretical and contextual setting for this work in relation to Family Interaction, Parenting and Wellbeing. The proposed IAP will provide a dynamic and accessible outline of the child's strengths and difficulties.

**Methods**: Initially, we will assess 160 parents of children with autism via an online Likert-scale survey to investigate parental understanding of autism. Follow-on, six parents that completed the survey will be randomly selected and interviewed to support the interpretation of the quantitative data from the online survey.

**Conclusions**: Currently, an individualised tool such as this is absent from the published literature and will add vital evidenced-based utility and accessibility for parents and professionals across educational, home and clinical settings.

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**Ref: 1227 Empirical Oral Presentation**

Accounting for differences in cognitive development at four years of age; a preliminary investigation.

Gráinne Kent1, Vasiliki Pitsia2, Gary Colton1

1National College of Ireland, 2Dublin City University

**Objectives**: Previous research has identified a range of factors across biological, family and socio-demographic and environmental domains which may influence cognitive development. The current research aimed to explore the influence of a range of these key factors on the cognitive development of four-year-old children within an Irish context.

**Design**: The data was collected as part a randomised control trial in Ireland.

**Methods**: The current study involved secondary analysis of data from the Preparing For Life evaluation (n=126). Cognitive development at age four was assessed using the British Ability Scales. The influence of a range of variables on cognitive development was explored using Independent Samples T-tests (child’s gender, maternal marital status, attempt to breastfeed, maternal drinking behaviour during pregnancy, maternal smoking behaviour and childcare use) and Pearson Product-moment correlations (maternal education status, maternal age, household income, maternal wellbeing, post-natal depression, maternal stress, levels of interaction with baby, maternal cognition and the home learning environment).

**Results**: A statistically significant difference was found in cognitive development at four years of age between boys and girls \( t(124) = -2.834, p = 0.005 \) and between children who came from mothers who had attempted to breastfeed and those who hadn’t \( t(120) = -2.494, p = 0.014 \). Additionally, household income (d=0.217, p=0.025), maternal cognition (m=81, SD=12.84, r=0.203, p=0.022) and level of interaction with the baby (m=2.72, SD=0.57, r=0.221, p=0.014) were found to be statistically significantly related to children’s cognitive development at four years of age.

**Conclusions**: The findings provide some preliminary evidence of the factors which may influence early cognitive development. Implications of the findings will be explored.

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**Ref: 1134 Empirical Oral Presentation**

The decreasing process of "Don't Know" response in young children

Tatsuaki Kondo, University of Toyama

**Objectives**: This study investigated the existence of decreasing process of “Don’t Know (DK)” response through young childhood, and the cognitive factor underlying this phenomenon.

**Methods**: Participants were 3-4 years old (n = 21) and 5-6 years old children (n = 25). They were asked two kinds of questions, close-ended (identified which cups the doll of dog was hidden) and open-ended (answering the name of animal in the picture). For each format, there were answerable questions and unanswerable questions. If the participants answered, “reasoning” questions (“Why do you know the answer?” or “Why don’t you know the answer?”) were conducted. The number of DK responses for answerable and unanswerable questions and the protocol for reasoning questions were analysed.

**Results**: About DK response for closed-format questions, younger children more gave it to unanswerable question than to answerable question, while older children’s DK responses had no difference between answerable and unanswerable questions. However, in regard to DK response for open-format question, both younger and older children more gave it to unanswerable questions than to answerable questions. About the protocol for reasoning question, older children tended to refer “inferencing” the answer to closed-unanswerable question.
Conclusions: This study suggests that for closed-unanswerable question, there is decreasing process of DK responses from 3-4 to 5-6 years old (but for opened-unanswerable question, there isn’t this process). It is also suggested that there is the cognitive factor underlying this process, i.e., older children infer the answer while recognizing that they don’t know the answer.

Ref: 1266 Empirical Poster Presentation
Prosociality and assertiveness: Associations with students' internalising and externalising problems
Jana Kvapilová, Flavia Cirimele, Mara Cattini, Luigi Portino, Belen Lopez-Perez, Antonio Zuffianò, Department of Psychology, Liverpool Hope University

Objectives: Understanding the predictors of students’ mental health is at the core of developmental psychology research agenda. Although previous studies pointed out to the importance of prosociality (a behaviour intended to benefit another), and assertiveness (tendency to affirm and defend one’s own point of view), as individual protective factors, the extent to which they jointly protect against internalizing (INT) and externalizing problems (EXT) deserves further investigation.

Design: In the current study, we tested the independent and interactive effects of prosociality and assertiveness in association with INT and EXT among at primary and secondary schools.

Methods: A sample of 742 students (Mage=11.74, SD=1.46) from 35 classrooms in Liverpool (UK) filled out validated scales of prosociality, assertiveness, and internalising and externalising behaviour.

Results: Multilevel regression indicated that higher level of prosociality and assertiveness at the student level predicted lower level of INT (b =-.07, p=.04 and b=-.14, p<.001, respectively) while controlling for gender and age differences (primary vs secondary school). Interestingly, EXT was differently predicted by prosociality and assertiveness: whereas prosociality was negatively related to EXT (b=-.29, p<.001), assertiveness predicted higher levels of EXT (b=.10, p<.001). Interaction effects between prosociality and assertiveness as well as their interaction with students’ age were not significant, suggesting that the effects of prosociality and assertiveness were consistent across school levels.

Conclusions: The practical implications of these findings are discussed by highlighting that excessive level of assertiveness may represent a risk factor for developing EXT during childhood and adolescence.

Ref: 1292 Empirical Oral Presentation
Conditional regards and need satisfaction: The mediating role of contextual parental attachment within achievement contexts
Ya-Hsin Lai, Sam Carr, University of Bath

Objectives: Research has paid scant attention to understanding the role of “attachment” in the association between parental conditional positive regard (PCPR), Parental conditional negative regard (PCNR) and basic psychological need satisfaction/frustration (BPNS/F).

Design: This present study aimed to explore the mediating effects of context-specific parental attachment between children’s perceptions of PCPR/PCNR and BPNS/F in the separate contexts of “sport” and “schooling”.

Methods: The Chinese version of the BPNSFP (Chen & Vansteenkiste et al., 2015), the Contextual Attachment Scales (CAS; Lai & Carr, 2017), and questionnaires assessing PCPR/PCNR (edited from Assor, Roth, & Deci, 2004; Assor & Tal, 2012) were administered to 381 Taiwanese youth athletes (84% boys, Mage=13.65±2.46).

Results: In both socialisation domains (sport and schooling) the relationship between perceptions of children’s PCPR/PCNR and BPNS/F was mediated by contextual parental attachment — (1) PCPR positively predicted parental attachment security, which then also positively predicted BPNS, yet negatively predicted BPNF; (2) PCNR negatively predicted parental attachment security, which then also negatively predicted BPNS, but positively predicted BPNF.

Conclusions: This study suggested that (a) there is a need for more studies examining whether parental attachment (or other potential social factors) can be a mechanism by which children’s perceived PCPR and PCNR are related with perceptions of BPNS/F in the contexts of sport and schooling; (b) the other promising consideration is to do more cultural-comparison studies, especially for the school-age children in their achievement-related fields, to understand
if the “positively” causal relationship between Taiwanese children’s perceived PCPR and parental attachment security is unique.

Ref: 1228 Empirical Poster Presentation

The Acorn Project – Impact of creative arts training on cognition and behaviour in the Early Years
Anna Bjerre Larsen, School of Psychology, University of East London

Objectives: Participating in creative arts training has been shown to have a positive impact on children’s learning. The Acorn Project provides artists delivering weekly arts sessions (dance, music, visual arts) to preschool children attending nurseries in areas of high deprivation in London. In this study behavioural measures are used to investigate the impact of dance training on development and to determine the relationship between training and developmental outcomes.

Design: Employing an experimental, within participants design this study investigates the impact of ten weeks dance training on skills that are closely linked to the training (e.g. motor skills), as well as skills that may be improved more indirectly (e.g. working memory and attention). Pre-intervention measures will be compared with post-intervention measures. The independent variable is the dance intervention and the dependent variable is scores obtained through behavioural measures (pre-, post-training).

Methods: Fourteen children around the age of two of mixed gender and ethnicity, with special educational needs and from disadvantaged backgrounds have been recruited from a nursery in East London. Behavioural measures have been obtained using standardised tasks of cognition, language and motor ability appropriate for this age group and taken from recognised developmental scales (Bayley Scale of Infant Development). Other standardized tasks measuring inhibition, attention and working memory have also been used. Reports on children’s behaviour have been administered and completed by caregivers and teachers.

Results: Analysis of pre- and post – intervention measures will help increase our understanding of how dance training can promote learning.

Ref: 1317 Empirical Oral Presentation

Development of the frustration response to goal-blocking during adolescence
Rachael Lickley, Catherine Sebastian, Gary Lewis, Royal Holloway

Objectives: Frustration is an antecedent process to reactive aggressive behaviour. Reactive aggression peaks during adolescence, a period of ongoing development in related processes such as emotional reactivity, emotion regulation, and inhibitory control. However, there is a paucity of research in a) developmental change in the ability to manage frustration during adolescence; b) how such changes may relate to reactive aggressive behaviour; c) whether the ability to manage frustration may be underpinned by development in inhibitory control. This study attempts to address these questions.

Design: A cross-sectional design was used. The goal-blocking task used has previously elicited modulated levels of frustration in adults, but such a design with the use of a more sensitive measure of frustration has not been used in adolescents.

Methods: Frustration was experimentally induced using an age-appropriate goal-blocking paradigm in 75 adolescents (11-16 years; mean=13.50 years, SD=1.35 years). Frustration induction and reactive aggression were measured via self-report. Inhibitory control was assessed using a Go/No-Go task.

Results: Frustration was induced successfully across the sample, and mean frustration was significantly positively related to reactive aggression tendencies. Age exerted a linear effect on mean frustration levels when controlling for internalising and externalising behaviours; age was a marginally significant predictor and reactive aggression was a significant predictor of frustration. Inhibitory control improved linearly with age but did not correlate with frustration or reactive aggression.

Conclusions: Results suggest developmental changes in the ability to manage frustration during adolescence, but do not suggest a strong role for inhibitory control development in this effect.
Ref: 1197 Empirical Oral Presentation
Sleep debt and reward processes in adolescent social development
Judith Lunn¹, Thomas Wilcockson¹, Tim Donovan², Padraic Monaghan¹
¹Lancaster University, ²University of Cumbria

Objectives: Theoretical models of adolescent neurodevelopment posit a crucial role of sleep. The study’s objective
was to investigate if sleep debt predicted responses to social and non-social reward-related contexts in adolescents
with high or low subjective social status.

Design: The study used a mixed factorial experimental design with three factors. One within subjects factor of
reward context (baseline, social, non-social) and two between subjects factors of sleep debt (less, more) and
subjective social status (low, high).

Methods: Participants were 75 adolescents (13-14 years, 41 females). An antisaccade task was interleaved within
social (Cyberball Game) and non-social (Card Guessing Game) reward contexts. Outcome measures were antisaccade
latency (processing speed) peak velocity (arousal) and errors (inhibition). Sleep debt and subjective social status
were measured via self-report. Data was analysed using generalized linear mixed effects models.

Results: Reward context modulated performance. Sleep debt and subjective social status had combined effects on
outcomes. The social context slowed processing speed, an effect that was most pronounced in high status
adolescents with high sleep debt. The non-social context increased arousal, an effect that was most pronounced in
adolescents with low status and high sleep debt. Inhibitory errors increased in both contexts, and was highest in the
social context. High status adolescents showed the greatest social – non-social difference in errors that became
attenuated with more sleep debt.

Conclusions: This study shows that sleep debt in adolescence impacts on social and non-social reward processes
with effects that vary dependent on individual differences in the salience of social status.

Ref: 1142 Empirical Poster Presentation
Interpersonal Emotion Regulation in Primary-School Children: The Role of Empathy and Effortful Control
Rasha Mahfouz, Michaela Gummerum, University of Plymouth

Objectives: Emotion regulation (ER) is the ability to change one’s own (intrapersonal ER) or others’ emotional
experience (interpersonal ER), mostly from feeling negative to feeling positive emotions. This study investigated (1)
whether children can change others’ (negative) emotions in interpersonal conflict situations; (2) whether there are
age differences in interpersonal ER strategies; and (3) whether children’s empathy and effortful control skills were
related to interpersonal ER.

Design: Cross-sectional mixed-methods design

Methods: Forty 7-year-old and 39 11-year-old children were presented with a bullying and a social-exclusion
scenario and were asked about the emotions of the violator and victim and whether and how the violators’ and
victims’ emotions could be changed. Participants’ open-ended responses were coded according to different
interpersonal ER strategies. Empathy and Effortful Control were assessed with questionnaires.

Results: In both age groups and scenarios, participants attributed negative emotions to the victim. The majority of
participants suggested appropriate strategies for changing the victim’s emotions, but older participants suggested
more sophisticated and cognitively-demanding ER strategies than younger children. Empathy, but not effortful
control, was positively correlated with the use of cognitively demanding ER strategies.

Conclusions: Interpersonal ER skills have been shown to be a vital component for developing high-quality
relationships. This research indicates that primary school children want to and can use strategies to change a victim’s
negative emotions in the context of interpersonal conflict situations. Studying determinants of children’s
interpersonal ER strategies may help in gaining a better understanding of how children establish and maintain high-
quality relationships.
Ref: 1296 Empirical Poster Presentation
WM in adolescence: What is the relationship with emotional regulation and behavioural outcomes?
Chiara Malagoli¹, Maria Carmen Usai²
¹Department of Education Science DISFOR University of Genoa, ²DISFOR University of Genoa

Objectives: Adolescence is a fundamental transition phase, marked by physical, social, cognitive and emotional changes. At this stage in development two contrasting phenomena take place: brain changes cause a sensitivity to emotional aspects (Dahl, 2004); while also control processes register as well impressive improvements (e.g. Best & Miller, 2010; Hooper et al., 2004).
The study is aimed to investigate the relationship between a core cognitive feature such as working memory (WM) (Diamond, 2013) and complex abilities such as emotion regulation (ER) and behavioural self-reported outcomes using a structural equation model approach.

Design: A sample of 227 typically developed adolescents between 14 to 19 years of age (148 females; mean age in months 202.8, SD 18.57) participated in this study.

Methods: The following tasks and self-reports were administered in a 45-minute test session in quiet room at school: Symmetry Span task (Kane et al., 2004). Reading Span task (Daneman & Carpenter, 1980), Mr Cucumber (Case, 1985); Youth Self-Report (YSR, 11-18 years, Achenbach, 2001); Difficulties Emotion Regulation Scale (DERS, Gratz & Roemer, 2004; Italian version by Giromini et al., 2012). Results showed that difficulties in ER correlated with WM: high levels of ER difficulties are associated with low WM efficiency.

Results: This study showed a significant relationship between self-reported difficulties in ER and WM, while no significant contribution of these predictors was showed on the behavioural outcomes.

Conclusions: These results contribute to add knowledge about how behavioural and emotional self-reported outcomes may relate to these processes.

Ref: 1211 Empirical Oral Presentation
The impact of home chaos on children’s self-regulation
Jessica Massonnié, Denis Mareschal, Natasha Z. Kirkham, Centre for Brain and Cognitive Development, Birkbeck University of London

Objectives: Home chaos is characterised by frequent noise, crowding, traffic patterns and few routines. We investigated whether it predicts elementary school children’s self-regulation, measured with executive function tests and temperament questionnaires.

Design: A cross-sectional design was adopted.

Methods: Study 1, focused on executive functions, was based on an opportunity sample of 84 children between 4.76 and 12.11 years old (M = 8.10) tested for inhibitory control (animal Stroop, n = 73; Flanker, n = 74), verbal (n = 83) and visuospatial (n = 60) working memory.
In Study 2, parents of 57 children between 4.77 and 11.82 years old (M = 7.70) rated children’s attentional focusing, inhibitory control, low-intensity pleasure, perceptual sensitivity, high intensity pleasure and impulsivity, using the Children’s Behaviour and Temperament in Middle Childhood questionnaires.
In both studies, home chaos was measured with the Confusion, Hubbub and Order Scale, and socioeconomic status with the Index of Multiple Deprivation.

Results: After controlling for age and socioeconomic status in regression analyses, home chaos did not predict any executive function task. However, it was associated with lower levels of attentional focusing, inhibitory control, perceptual sensitivity, and marginally higher levels of impulsivity, measured through temperament questionnaires. The effect for high intensity pleasure interacted with age.

Conclusions: These results call for the use of comprehensive approaches to study the impact of home chaos on children’s self-regulation. Combinations of laboratory tasks, questionnaires, and observations in real-life settings are suggested to better understand how children perceive, select and react to the information in their environment.
Ref: 1156 Empirical Oral Presentation

Associations between motor and spatial abilities in Typical Development and in individuals with Williams Syndrome

Leighanne Mayall, Emily Farran, UCL

Objectives: Williams Syndrome (WS) is a rare genetic neurodevelopmental disorder. Despite a severe deficit in motor abilities in this group, this has scarcely been investigated. The aim of our research was to determine the WS motor profile, and to investigate the relationship between motor ability and the known spatial deficit in WS. The second aim was to investigate the association between motor ability and participation in physical activity in WS.

Design / Method: Twenty participants with WS (16-50 years) and 40 typically developing (TD) children (4-7 years) took part. Motor ability was assessed using the Bruininks–Oseretsky Test 2 short form (BOT2-SF). Spatial skills were assessed using a block construction task, and a mental rotation task. Participation in physical activity was assessed via questionnaire.

Results: Individuals with WS exhibited impaired motor ability, performing within the “well below average” or “below average” zones on the BOT2-SF. The overall level of motor ability in the WS group was similar to TD 4-5-year-olds, but importantly their profile of motor skills was atypical. Correlations were shown between block construction, and both fine and gross motor and between mental rotation and gross motor ability in the WS and TD groups. Correlations between motor ability and physical activity score were significant in the TD children, but not the WS group.

Conclusions: The motor abilities of individuals with WS are not featured in the classic phenotypical description, yet are severely impaired in this group, and associated with the hallmark deficit in visuospatial skills in WS.

Ref: 1216 Empirical Poster Presentation

Evaluating the effectiveness of a programme to raise awareness and understanding of healthy relationships in primary schools

Jessica McElwee, Claire Fox, Keele University

Objectives: A number of school-based domestic abuse prevention programmes have been found to be effective in bringing about attitudinal change. However, provision is patchy and there is a lack of programmes targeted at primary school children. The aim of the current research is to assess primary school pupils’ and teachers’ responses to the GREAT project.

Design: Mixed-methods.

Methods: A pre and post survey was completed by pupils aged 9-11 years. In addition, four focus groups with pupils were conducted across two of the schools involved. An online survey and focus groups were conducted with the teachers.

Results: The majority of the young people were very positive about the project. Emerging themes include teachers being best placed for delivering the project as they have an existing relationship with their class and understand their class needs. The children also felt the project needed to be delivered over a longer period of time and raised some issues surrounding gender. Another main theme was the project being age appropriate by using fun and creative methods to educate the young people.

Conclusions: The emerging themes indicate that the young people responded well to the messages conveyed, but caution needs to be taken when portraying the gendered nature of abuse. The findings also indicate that the teachers are best placed to deliver healthy relationship education. These findings will be discussed in the context of the challenges of incorporating this type of education into the curriculum.
Ref: 1244 Empirical Oral Presentation
An exploration of the scope of cumulative culture in young children in experimental micro-societies
Nicola McGuigan\textsuperscript{1}, Andrew Whiten\textsuperscript{2}, Emily Burdett\textsuperscript{3}, Amanda Lucas\textsuperscript{4}, Gill Vale\textsuperscript{5}
\textsuperscript{1}University of the West of Scotland, \textsuperscript{2}University of St Andrews, \textsuperscript{3}University of Coventry, \textsuperscript{4}University of Exeter, \textsuperscript{5}University of Texas

Objectives: Adult humans display a remarkable capacity for cumulative culture, with knowledge and technology accumulating over time, yet the way in which this capacity develops in childhood remains unclear. The aim of the current study was to explore the development of cumulative culture, and the innovations essential to it, using a novel experimental design. More specifically, we presented groups of preschool children with a novel task that afforded the cumulative development of a variety of tool techniques to gain increasingly attractive rewards, across four increasingly demanding levels of complexity. In contrast to earlier studies, we found evidence for cumulative cultural progress, with inventions of solutions at more straightforward levels spreading amongst members of the group to become shared innovations. In turn, the solutions to the lower level problems were built on by other children in the group thus creating more difficult but more rewarding innovations at more complex levels. The cumulative progress witnessed in our groups of children contrasted markedly with the lack of progress witnessed in our asocial control children, who worked only by themselves. Further experiments demonstrated that even higher levels of cumulative innovation could be achieved in our groups through: 1) the introduction of older children capable of higher-level inventions, or 2) through the imposition of greater ecological challenges by removing the easiest habitual solutions. In conclusion, our experiments provide, what is to our knowledge, the first experimental evidence that capacities for cumulative cultural progress are already developing in young children.

Developmental Award Winner Presentation (Neil O’Connor 2018 Award)
Developmental pathways of ADHD from childhood to adulthood: cognitive and neural markers
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Attention-deficit/hyperactivity disorder (ADHD) is a highly heritable neurodevelopmental disorder associated with wide-ranging impairments in cognitive and brain functions. The disorder persists into adolescence and adulthood in up to two thirds of individuals diagnosed in childhood, but the mechanisms underlying remission and persistence are poorly understood. This talk will focus on a series of studies aiming to identify the processes underlying ADHD persistence and remission, in order to provide new insights into the risk and developmental pathways. Specifically, we investigated the developmental and aetiological pathways of cognitive-EEG impairments in a follow-up sample of adolescents and young adults with a childhood diagnosis of ADHD, their siblings and age-matched control participants. The findings suggest that cognitive and event-related potential (ERP) indices of attention-vigilance and error processing are markers of ADHD remission, distinguishing between individuals with persistent and remitted ADHD at follow up. Instead, cognitive-ERP measures mapping onto executive and conflict monitoring processes, and indices of brain functional connectivity during cognitive performance are insensitive to ADHD outcome at follow up, as they do not differentiate between ADHD remitters and persisters. By examining the aetiological structure of a broad range of cognitive-ERP measures sensitive to differences between individuals with persistent ADHD and controls, we further found that impairments in these measures map onto three partially separable aetiological (familial and non-familial) processes, which show moderate-to-large overlap with the aetiological influences on ADHD. Overall, by using a combination of cognitive, EEG, developmental and sibling-modelling approaches, these studies further our understanding of the developmental and aetiological pathways to atypical cognitive and neural profiles in adolescents and adults with persistent and remitted ADHD.
Ref: 1209 Empirical Oral Presentation
Children Can Plan for the Future in a Novel Tool Functionality and Inhibition Paradigm
Rachael Miller¹, Anna Frohnwieser², Ning Ding¹, Alex Taylor², Sarah Jelbert¹, Markus Boeckle³, Nicky Clayton¹
¹University of Cambridge, ²University of Auckland, ³University of Cambridge

Objectives: Decisions involving the choice and use of tools for future events require episodic foresight. Although previous studies suggest that non-human species can plan for the future, they face critiques relating to alternative learning explanations.

Design: We present a novel experimental paradigm featuring different types of tools, apparatuses and rewards, which addresses these critiques. Firstly, we used single trials to avoid consistent exposure to stimulus-reward relationships. Secondly, we used training trials to provide subjects with experience of a predictable return of reward. Thirdly, unlike standard developmental studies, children were not verbally cued during testing and we incorporated two delays – one prior to and the other following tool choice.

Methods: The critical tool choice included two tools with equal prior reward experience, where each tool was functional for one apparatus only. We tested inhibitory control by asking children to choose between an immediately available reward of lower quality or a tool to obtain a delayed reward of higher quality. Participants were 87 pre-schoolers (44 boys, 43 girls) aged 3-5 years.

Results: Our results echoed standard developmental research as we found a significant age effect; 4- and 5-year-olds performed better in test trials than children aged 3. Children of all ages showed a general interest in tool use, even when the most preferred reward was available immediately.

Conclusions: The paradigm taps into children’s episodic foresight while addressing critiques of animal studies. Importantly, this new paradigm could be used to explore future planning in the context of tool functionality and inhibition across species.

Ref: 1098 Empirical Oral Presentation
Young children’s theory of mind and relational aggression: the moderating effect of maternal emotional expressiveness
Ai Mizokawa¹, Mai Hamana²
¹Nagoya University, ²The University of Tokyo

Objectives: This study aimed to examine the relationship among young children’s theory of mind, relational aggression, and maternal emotional expressiveness. It was hypothesized that the relationship between theory of mind and relational aggression is moderated by maternal emotional expressiveness.

Design: This cross-sectional study was part of a bigger longitudinal project.

Methods: Forty young Japanese children aged 4 to 6, their mothers, and their classroom teachers participated in this study. Each child completed theory of mind tasks (first-order false belief tasks; Harris et al., 1989) and a Picture Vocabulary Test-Revised (Ueno et al., 2008). Teachers answered 5 questions about each child’s relational aggression (Isobe & Sato, 2003). Maternal emotional expressiveness in mother-child interactions was assessed by using a modified version of the Self-Expressiveness in the Family Questionnaire (Halberstadt et al., 1995; Mizokawa, 2013). Regression analyses and simple slope analyses were performed to test if maternal emotional expressiveness was a moderator in the relationship between theory of mind and relational aggression.

Results: Theory of mind was revealed as a significant predictor of relational aggression. Moreover, mature theory of mind was associated with higher relational aggression in the group with high maternal negative emotional expressiveness, whereas the effect was not significant in the group with low maternal negative emotional expressiveness.

Conclusions: The results suggest the cases in which children can use theory of mind for antisocial goals. Further longitudinal data is required to explore the long-term effect of the maternal negative emotional expressiveness.
Ref: 1283 Empirical Poster Presentation
Are children who could not wait more impulsive than who could wait?
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1Mukogawa women’s university, 2Mie-chuo medical center, National hospital organization

Objectives: In this study, differences of reflection-impulsivity (one of factors to affect successful self-regulation) between groups divided by self-regulation behaviours through 2 to 6 years of age, were examined.

Design: The JCS is a birth cohort study started in 2004 in Japan (cf. Yamagata et al. (2010)). Data used in the present study were collected during 2007 to 2012 at the Mie Chuo Medical Center.

Methods: The data of 72 children (38 boys, 34 girls) with records in all four age points (2.5, 3.5, 5 and 6 years of age) were analysed. They were presented with two tasks; self-regulation task and reflection-impulsivity experiment (arranged MFF task (cf. Miyakawa (2000))).

Results: 31 children succeeded at all age points (groupA). The others were divided further into two groups by the result at 6 years of age; succeeded-group (groupS, 25 children) and failed-group (groupF, 16 children).”

Reflection-impulsivity was compared among the three groups at the two age points  (MANOVA).

As a result, there was a significant difference in the mean latency between groupA and groupF (F(2,56)=2.82, A>F). The percentage of correct answers showed interaction (F(1,56)=2.56), GroupS was lowest score at 5 years of age, but GroupF was lowest at 6 years of age.

Conclusions: The result indicated the existence of two types of children; one is able to behave adaptively in all ages, the other is unstable one. The latter, especially failed at 6 years of age, tend to behave impulsively. To control impulsive behaviour may lead successful self-regulation behaviour at the time.

Ref: 1312 Empirical Oral Presentation
Emotion recognition in adolescence: longitudinal influences of socio-emotional factors and lateralization for emotion processing
Rachel Nesbit, Dawn Watling, Royal Holloway, University of London

Objectives: This study evaluates the extent to which different facets of social anxiety, depression and lateralization for emotion processing can predict facial emotion recognition (FER) in female adolescents. Further, it examined longitudinally how changes in these factors may influence FER at both 6 and 12 months.

Design: A longitudinal design was used, with participants tested three times in a 1-year-period. Change scores were calculated to examine how changes in the collected measures predict later FER.

Methods: Three-hundred and eighty-nine female adolescents aged 11-17 (Mage=13.94, SD=1.63) completed a questionnaire measure of depression and social anxiety, as well as a chimeric face test (measure of laterality for facial emotion processing), and an FER task at time 1, time 2 (N=263) and time 3 (N=204). Participants completed all tasks on a computer or an iPad on Qualtrics survey software.

Results: At time 1, higher avoidance and distress in general situations negatively predicted FER. When examining longitudinal predictors, baseline measures of social anxiety and depression, as well as changes in social anxiety and depression predicted FER at time 2. Baseline measures of lateralization for emotion processing predicted FER at time 3 (a year after initial testing), where no other predictors were significant.

Conclusions: These findings demonstrate the importance of socio-emotional factors in predicting later FER, however suggest that social anxiety, depression and lateralization for emotion processing may be differentially important over time in predicting FER skills.

Developmental Award Winner Presentation (Margaret Donaldson 2018 Award)
§Becoming Us and Them
Dr Harriet Over, University of York

Prejudice and discrimination remain pressing social problems. In this talk, I will discuss the origins of these social problems in development. I will focus, in particular, on the ways in which social learning contributes to children’s intergroup biases and how understanding the role of social learning might help inform research-led interventions to encourage more egalitarian attitudes and behaviour.
**Ref: 1082 Empirical Oral Presentation**

**The development of categorisation in pre-schoolers**
Kay Owen, Christopher Barnes, *University of Derby*

**Objectives:** Whilst infant categorisation has generated innovative research, the pre-school period has been largely neglected. This research sought to develop an engaging toolkit and use it to investigate whether pre-schooler’s categorisational abilities are impacted by sex, socio-economic status or presentation modality.

**Design:** Four studies, (each comprising four tests) allowed progressive refinement of the toolkit and provided cumulative insights into categorisation’s developmental trajectory.

**Methods:** Participants (n = 451) aged 30-60 months and from diverse socio-economic backgrounds, were tested in their Preschools by one researcher. Tests varied in complexity. Test One focused on categorising colour, Two on shape; tests Three (using drawings) and Four (using toys) allowed free-categorisation using perceptual and thematic criterion. All generated descriptive and inferential statistics.

**Results:** Significantly more boys than girls were unable to categorise on the basis of shape e.g. (χ² (1,190) = 94.5, p = .001, r=.71) and colour (χ² (1,190) = 73.28, p < .001, r= 0.07). Girls also created more categories (U = 5,515.00, p = .003, r = 0.19) and used more toys to form categories (U = 5,628.5, p = .001, r = 0.19) than boys. Significant differences were found between socio-economic groups in tests using images (p < .001) and toys (p < .001). Furthermore, a significant interaction was found between sex and SES.

**Conclusions:** The toolkit’s fine-grained differentiation illuminates previously unrecognised developmental disparities largely based on sex and SES. Maleness and poverty act as a double-whammy. Children make more categories and generate more thematic categories, with toys than with images.

**Ref: 1321 Empirical Oral Presentation**

**Once upon a time: Collaborative creativity of children and adolescents in story writing**
Pinar Oztop¹, Pinar Oztop¹, Michaela Gummerum²
¹Liverpool Hope University, ²Plymouth University

**Objectives:** Children’s creative collaborations in non-academic domains as well as cross-cultural dynamics of these collaborations received very little attention. The first study assessed the age differences in collaborative creativity of English children with a focus on the role of social perspective coordination and intrinsic motivation. The second study additionally assessed the role of task cohesion on collaborative creativity with Turkish children.

**Design:** The first study adopted a correlational design, whereas the second study was a combination of correlational and experimental design.

**Methods:** The first study was conducted in England with 93 children (10-14.5 years old). Age differences in collaborative creativity and how social perspective coordination and intrinsic task motivation affected it were assessed using the collaborative story-writing task. The second study was conducted in Turkey with 162 children (10-14 years old). Assessed variables and the task were the same. Groups were randomly assigned either to the task cohesion condition, or to the control condition.

**Results:** In both studies, group creativity ratings of older children were significantly higher than ratings of younger ones. While social perspective coordination was a positive predictor of group creativity, intrinsic motivation was not. Additionally, groups of Turkish children in task cohesion condition had more creative stories than children in control groups.

**Conclusions:** Collaborative creativity was found to develop with age. Social perspective taking coordination, age and task cohesion were found as facilitators of children’s collaborative creativity. However, intrinsic motivation was not found a predictor of collaborative creativity in younger ages. Finally, in both England and Turkey, predictors of collaborative creativity were similar.
Ref: 1220 Empirical Oral Presentation
Dimensions of Social Understanding in 7-Year-Olds with Disruptive Behaviour Disorder
Amy Paine, Dale Hay, Cardiff University

Objectives: Children with disruptive behaviour disorder (DBD) sometimes demonstrate problems in social cognition, such as deficits in false belief (FB) and emotion understanding (EU) tasks (Hughes et al., 1998), and attributional biases in social information processing (SIP) (Dodge, 1993). However, some disruptive children may have intact, superior or deviant sociocognitive skills (Happé & Frith, 1996). Few studies examine different dimensions of social cognition in the same sample; therefore we did so in a community sample of 7-year-olds with and without diagnoses of DBD.

Design: Children were observed at age 7 in the Cardiff Child Development Study (n=268, M=83.30, SD=4.54).

Methods: Social cognition was assessed using adapted measures of second-order FB, EU and SIP enacted with Playmobil figures (Paine et al., 2018; Pollak et al., 2000, Quiggle et al., 1992). Primary caregivers were interviewed using the Preschool Age Psychiatric Assessment (PAPA; Egger et al., 2006) to identify cases that met DSM-IV criteria for DBD with clinical impairment.

Results: Children with DBD were less likely to pass the FB task (9% DBD, 32% non-DBD), and scored lower on EU (mean difference=7.09). For SIP, children with DBD were more likely to generate aggressive responses (30% DBD, 15% non-DBD). When controlling for relevant covariates (e.g., age, gender, verbal IQ, working memory, socioeconomic adversity), differences in second-order FB remained significant (p <.05).

Conclusions: The findings corroborate studies demonstrating disruptive children’s difficulties inferring the mental states of others and identify risk factors that underlie social cognitive problems.

Ref: 1056 Empirical Oral Presentation
Identification of Social Looking Behaviours in Infancy
Silvia Panella Peral, Dr. Luke Beardon, Dr. Tim Jay, Sheffield Hallam University

Objectives: Social looking is an integral part of any infant’s affective and social development. This research aims to examine social looks in natural settings to create an in-depth conceptualisation of the types of social looking behaviour in neurotypical infants and those at risk of having autism.

Design: Using a naturalistic approach of enquiry in the form of observational data, natural interactions between infants and adults were recorded and analysed so to have a "snapshot" of social encounters in order to identify initiated social looking behaviour in infants.

Methods: 23 subjects aged between 12-14 months were recruited via early care settings; 17 of the 23 took part on a follow up study 3-months later. Video recordings of interactions in nursery setting took place and video data was analysed as to create an in-depth nomenclature of social looking patterns. A second study with infants at risk of autism is currently taking place.

Results: A total of 16 different categories of social looks were identify and classified in the data. The nomenclature of social looks categories created in this study are organised by the goal they serve and not by the perceptual similarities they present. Social looks categories reflect how infants use the different types of social looks to create meaning of the social world in real life situations.

Conclusions: This research redefines social looking as an experiential construct and not as an isolated behaviour. The typologies of social looks provide a greater understanding of how social looks facilitate social learning and how might differ in autism.

Ref: 1123 Empirical Poster Presentation
Neurotypical Recognition of Autistic Emotional Facial Expressions
Amy Pearson, University of Sunderland

Objectives: There is a wealth of literature examining the ability of autistic individuals to recognise facial expressions of emotion in Neurotypical (NT) faces, but to date very little research has examined whether NT individuals can recognise autistic emotive facial expressions. The aim of this study was to investigate the ‘double empathy’ problem in a sample of NT adults, testing their ability to recognise each of the six basic emotions in autistic individuals.
Design: A 2 (gender) x 6 (6 basic emotions) mixed design was used, in which participants were presented with images of autistic adults displaying the emotions ‘happy’, ‘sad’, ‘scared’, ‘surprised’, ‘disgusted’ and ‘angry’. The dependent measure was accuracy.

Methods: 109 NT adults (mean age 34 years) took part in this study, which was presented online using Qualtrics. Opportunity sampling was used, with the majority of participants recruited via snowball sampling on social media. Participants viewed each image and chose a single emotion from a choice of 6 in a forced choice paradigm.

Results: Results were analysed using a 2x6 mixed factorial ANOVA and showed a significant effect of emotion type with participants most accurate at identifying ‘happy’ (M=81) and least accurate at identifying fearful (M= 50). There were no effects of gender, or interactions between gender and emotion type.

Conclusions: Results suggest that the ‘double empathy’ problem may extend to recognition of emotive facial expressions in NT adults, and support research suggesting that intervention to improve social communication between autistic and NT adults should be mutual.

Ref: 1304 Empirical Oral Presentation
Pre-schooler Touchscreen Use and Creative Thinking
Stephanie Powell¹, Elena Hoicka²
¹University of Sheffield, ²University of Bristol

Objectives: The primary objective of the study is to explore relationships between touchscreen use and creative thinking in 24- to 47-month-olds using behavioural measures. Additionally, the study explores whether touchscreen use potentially displaces non-digital activities and if these relate to creative thinking as well.

Design: To begin exploring the influence of touchscreen use on creative thinking, the study uses a correlational design. Divergent thinking and problem-solving are measured using behavioural tasks. Parents are asked to report on their children’s touchscreen use (including types of apps used) and engagement in non-digital activities.

Methods: The sample will consist of 84 24- to 47-month old children, recruited from the research volunteer list. Children are video-recorded completing the Unusual Box Test and the Great Ape Tool Test Battery to measure divergent thinking and problem-solving respectively. The tests are coded and analysed after establishing agreement.

Results: The study is ongoing so analysis is yet to occur. Data will be checked for normality and correlations will be run in line with the study aims. The results will be discussed during the presentation.

Conclusions: The study gives insight into the relationship between touchscreen and creative thinking. This is valuable for research, parents and policy-making as there is much debate about children’s screen use. Study limitations include parental reports on touchscreen use and correlational design. However, it provides a foundation for experimental research to build on and establish a richer understanding of the influence of touchscreens.

Ref: 1128 Empirical Oral Presentation
Early literacy in the digital age: Longitudinal relationships between visual attention, digital exposure and emergent literacy
Tanja Prieler¹, Clare Wood², Jenny Thomson¹
¹University of Sheffield, ²Nottingham Trent University

Objectives: This paper’s primary objective was to explore the longitudinal relationships between children’s exposure to digital devices, visual attention development and traditional predictors of reading and their impact on word reading after the first school year. Main research question: Can visual attention or digital exposure account for individual variation in word reading outcomes after one year of schooling?

Design: The study adopted an experimental longitudinal design.

Methods: 140 participants (Age: M = 4;7, SD = 3.34) from a normative group of UK Reception Year children were tested at the beginning of the school year and retested 12 months later on their visual attention and other traditional literacy precursor skills, including: phonological awareness, letter-sound-knowledge, receptive vocabulary, and non-verbal ability. Outcome measure single word reading was assessed at the second time point. Furthermore, information was gathered on children’s digital exposure prior to school entry and during the first year of schooling. Correlational and regressional analyses were adopted to analyse the data.
**Results:** Cross-sectional data at both time points demonstrated moderate correlations between visual attention and traditional precursor skills of reading, but no relationships between children’s digital exposure and their visual attention skills. Longitudinal analyses showed that visual attention contributed to the variance in reading.

**Conclusions:** This study extends our knowledge concerning the role of visual attention and digital exposure as potential new precursor skills for reading. Challenges of accurately measuring children’s digital exposure are discussed as key limitation.

Ref: 1246 Empirical Poster Presentation

**Effects of television food cue exposure towards children’s unhealthy eating in Malaysia**

Hanis Ramdzan, *University of Sheffield*

**Objectives:** Television food promotions are believed to have impact on children’s unhealthy eating behaviour. The purpose of this study was to investigate whether exposure towards unhealthy food cues in both advertising and non-advertising during television viewing may prompt snacking among children. The study tested the hypothesis that exposure towards food cue during television viewing may encourage impulsive food consumption among children.

**Design:** The study was the first to explore the immediate effects of food cues presented during television viewing in Malaysia. This study utilized a novel approach in the study of food promotion effects on children.

**Methods:** A total of 125 primary school children aged between 7 and 9 were randomly assigned to four conditions. Children watched a short video of animated cartoon which included a food cue (advertising or non-advertising) or a non-food cue (toy advertising or control). Immediately after the television viewing, children were given a bag of pre-weighed crisps. The total amount of crisps consumed was measured (in grams).

**Results:** Children who were exposed to food cues in both advertisement and non-advertisement consumed 51% more crisps than those who were not. There is no difference between the type of food cue exposure; advertisement or non-advertisements.

**Conclusions:** The current research demonstrated the negative impact of unhealthy food cue exposed during television viewing on children’s eating behaviour in Malaysia.

Ref: 1267 Empirical Poster Presentation

**The depression related cognitive profile of young people with ASD**

Sinead Rhodes, Tracy Stewart, Daniel Hannam, Jessica Oldridge, Emma Yong, *University of Edinburgh*

**Objectives:** Depression is highly prevalent in young people with autism spectrum disorder (ASD). Despite this high prevalence, knowledge of the cognitive factors associated with depression, namely over general memory (OGM), and the factors that maintain OGM such as executive control and rumination, is limited.

**Design:** We aimed to examine the depression-related cognitive profile of young people with ASD. 14 young people (aged 18-27 years) diagnosed with ASD and an age and sex matched control group participated in the study.

**Methods:** All participants completed the Minimal Instruction Autobiographical Memory Test, the Ruminative Response Scale and the Internal Shift Task, an executive control task that includes an emotion condition. They also completed the DASS-21 and the AQ-10.

**Results:** The participants with ASD showed significantly higher depression symptoms as predicted than the control group. Participants with ASD also engaged in higher levels of brooding rumination similar to the profile of individuals with depression.

**Conclusions:** Our study shows that young people with ASD show high symptoms of depression and some cognitive features that have been previously shown in those with depression without ASD.

Ref: 1313 Empirical Oral Presentation

**Risk-taking in economic decisions depends on culture in 5-10 year olds**

Erin Robbins, *University of St Andrews*

**Objectives:** The “cushion hypothesis” predicts individuals in collectivistic cultures should be more risk-taking in economic decisions because they perceive themselves supported by a social safety net.
We compared risk-taking behaviour and probability reasoning of 5-10 year-old children in collectivistic Taiwan and individualistic UK. We predicted Taiwanese children would be more risk-taking than UK children, opting for gambles over sure bets.

**Methods:** 60 children (N=30 in each culture) completed two tasks. In the Cup Game, children received a small endowment. In four conditions, children chose between a sure bet (1 coin) and a gamble, which varied in riskiness (low risk: 50% chance of 2 coin win/loss; high risk: 25% chance of a 4 coin win/loss). In the Probability Game, coins were hidden under 9 of 10 cups, with one cup hiding a “robber” that negated any winnings. Children could opt to pick as many cups as they liked at once (one-shot condition) and then again when the content of each cup was revealed in turn (sequential condition).

**Results:** In the Cup Game, the proportion of gambles taken depended on condition for UK (X²=6.16, df=1, p=.013, Cramer’s V=.223) but not Taiwanese children, who opted for gambles across conditions. No differences emerged in the Probability Game, where children in both cultures took equivalent risks (~4/10 cups) in both conditions.

**Conclusions:** Confirming predictions, collectivistic children were riskier than their individualistic counterparts in gambling tasks. These results cannot be attributed to probabilistic reasoning, suggesting a role for culture in framing economic decision-making.

Ref: 1290 Empirical Oral Presentation

**What is fairness? Assessing convergent validity between sharing games**
Erin Robbins, University of St Andrews

**Objectives:** In studies of sharing behaviour, free distribution tasks (participants directly distribute resources) and forced choice tasks (participants choose between predetermined equitable and inequitable resource allocations) are both thought to assess children’s sense of fairness.

The aim of this study was to determine the association between these different games, and to determine whether children’s sharing tendencies are consistent over time.

**Design:** We hypothesized that if both game types measure children’s egalitarianism, there should be strong associations between children’s sharing over time as well as between game types.

**Methods:** 60 children (5-7 years) played a counterbalanced series of five forced choice and free distribution sharing games; they repeated these games again one month later.

**Results:** A series of Pearson and Spearman correlations revealed few significant associations between children’s sharing at Time 1 and Time 2, suggesting that they were fairly inconsistent in how they approached the games (all r and rs < .185, p >.05). Results also suggested little overlap between game types, with only 17% of correlations yielding significant associations (p<.05). Children who were equitable in free distribution were not necessarily egalitarian in forced choice tasks pitting equitable and inequitable outcomes against each other.

**Conclusions:** Results call into question the convergent validity of forced choice and free distribution sharing tasks. Lack of association between games and measurement times may help to explain discrepancies in the literature on children’s inequity aversion and developing sense of fairness. Preliminary analysis of a follow-up study of 50 additional children validate these claims.

Ref: 1289 Empirical Oral Presentation

**Associations between resource control and social dominance, and relationships with resource holding potential comprehension**
Alan Roberts, Claire Monks, Stella Tsermentseli, University of Greenwich

**Objectives:** To investigate: the relationship between resource control and social dominance; effects of treating the same resource control data as continuous or categorical; the presence of RHP comprehension in young children and its associations with resource control/social dominance.

**Design:** A questionnaire/performance measures-based, cross-sectional design was employed to investigate resource control, social dominance and RHP comprehension across three time points in one school year.

**Methods:** Ninety-two children (UK) from four classes (M age = 4.67 years, SD = 0.33 years) in their first year of state school were recruited. Teacher reports established ratings of child resource control behaviour/strategy and social
dominance. Child assessment utilised measures for verbal ability and resource holding potential/power (RHP) comprehension. Cross-sectional analyses of each were undertaken.

**Results**: Hierarchical regressions, ANCOVAs and t-tests found significant differences in resource control’s association with social dominance, and significant differences in children’s prosocial and coercive responses in the RHP comprehension measure according to ‘toughness’ of opponent regardless of sex, age and verbal ability. No relationship was found between RHP comprehension and either resource control or social dominance.

**Conclusions**: Treatment of the same resource control data as either continuous or categorical data produces significantly different results that can cause different conclusions to be drawn regarding real-world associations between resource control and social dominance in early childhood. Findings revealed opposite of expected effect of developed RHP comprehension compared to findings in human adults and non-human research, suggesting other cognitive/affective factors may have a mediating effect. Limitations include an absence of observational data.

Ref: 1176 Empirical Oral Presentation

“I just got a popped up in my head”. A qualitative analysis of how executive control processes contribute to children’s creativity

Cathy Rogers¹, Michael Thomas², Andy Tolmie³

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**Objectives**: There is continued debate about the role of executive functions (EF) in creativity. Some evidence suggests their primacy, other evidence indicates detrimental effects of focus. Most research involves adults in laboratory settings, raising two problems: creativity and EF are both multi-faceted concepts unlikely to reveal themselves fully in lab tests; and the evidence may not extrapolate to children.

**Design**: This study, part of a mixed methods research project, attempts to address these shortcomings by assessing children’s creativity in a naturalistic setting. The qualitative approach employs children’s accounts of their creative process to generate hypotheses regarding the cognitive mechanisms involved.

**Methods**: Fourteen children aged 6-10, drawn from a larger sample who had completed lab tests, were assessed in their homes. They chose to create a story or picture, selected stimuli as ‘sparks’ and completed the activity without time constraint. The whole process was filmed. Immediately afterwards, video-stimulated recall and semi-structured interviews elicited children’s accounts of their creative process, with a focus on EF. Interviews were analysed within a theoretical thematic analysis framework.

**Results**: Children’s accounts suggested their creativity involves a delicate, dynamic balance between control and spontaneity. This balance is modulated by the phase of the creative process (generative/evaluative), the domain (storytelling/drawing) and changing constraints, as well as by the child’s personality characteristics.

**Conclusions**: Monolithic portrayals of EF and creativity fail to capture the complexity of their relationship. More precise research, based on hypothesised mechanisms, is required if we are to improve our understanding of a process central to human development.

Ref: 1269 Empirical Oral Presentation

Divergent thinking and pretend play: Is the relationship reciprocal?

Sarah Rose, Ruth Pettitt, Staffordshire University

**Objectives**: There is considerable evidence of a positive association between young children’s divergent thinking skills and pretend play. Furthermore, there is some evidence that engaging in pretend play may increase divergent thinking. Our objective was to assess whether engaging in divergent thinking would improve children’s pretend play.

**Design**: An experimental, between group design was used. This involved one group of children completing a task designed to promote divergent thinking while the other completed a control task. Directly after this, each child took part in an assessment of pretend play.

**Methods**: 57 4-year-old children individually participated in a 10-minute task either involving questions requiring divergent thinking (alternate uses, instances and pattern meaning tasks) or involving control questions all requiring a yes or no answer. Directly after answering the questions each child completed The Affect In Play Scale-Preschool task (Kaugars & Russ, 2009), involving the researcher introducing a set of play items, acting out a story stem and
then encouraging the child to continue the story for 5-minutes.

**Results:** No significant differences were found between the pretend play of children who had completed the divergent thinking questions compared to the control questions.

**Conclusions:** The divergent thinking questions used did not promote quality of pretend play more than the control questions. However, children in both conditions demonstrated high levels of pretend play. Therefore, it is possible that the adult interaction and questions used in both tasks may have benefited children’s pretend play. Nonetheless, no evidence for divergent thinking improving pretend play was found.

**Ref:** 1303 Empirical Oral Presentation

**Growing me: The development of the self-reference effect across childhood.**

Josephine Ross¹, Jacqui Hutchison², Sheila Cunningham³

¹University of Dundee, ²University of Aberdeen, ³University of Abertay

**Objectives:** Linking to-be-remembered information with the self-concept leads to increased attention and elaboration of the material. As a result, adults show a retrieval bias for information that has been linked to the self at encoding, known as the ‘self-reference effect’ (SRE). However, we currently have very limited information about how the SRE develops across childhood. This omission is important, since SREs can be applied as a methodological tool to elucidate development in the self-concept.

**Design:** Across two studies, children completed memory tests designed to prompt self-referent encoding.

**Methods:** In study one, 197 6- to 11-year-olds were asked to recognise objects presented with an image of themselves or another child, in some cases they were asked whether the person pictured liked the object. In study two, 48 8 to 11-year-olds completed the same tests, and an adapted version of the standard adult SRE paradigm, based on deciding whether trait words were self-descriptive.

**Results:** In study one, children of all ages showed a significant memory bias for self-referent stimuli in all encoding conditions. However, patterns across both studies suggested that although children of all ages benefited mnemonically from the attention capture associated with the self-image, they derived no additional benefit from self-evaluative processing until late childhood, at which point they were also able to show SREs on the standard trait paradigm.

**Conclusions:** These results improve our understanding of the emergence of self-evaluative processing, and suggest that the self-concept may not be sufficiently developed to support elaborative encoding effects until late childhood.

**Ref:** 1280 Empirical Oral Presentation

**Trust Beliefs in Physicians by Children with Asthma and their Mothers:**

Ken Rotenberg¹, Serena Petrocci²

¹Keele University, ²Università della Svizzera Italiana

**Objectives:** Identifying the factors that predict adherence and quality of life in paediatric patients is crucial to their medical treatment. The current study examined the relations between trust beliefs in physicians, adherence to prescribed medical regimes and quality of life in children with asthma.

**Design:** Longitudinal and cross-sectional design

**Methods:** 143 children with asthma (116 males, M = 12 years- 7 months) and their mothers were tested. Standardised measures were administered at two testing times that assessed the children’s and mothers’ trust beliefs in physicians, the children’s quality of life, and adherence to prescribed medical regimes (adherence).

**Results:** SEM analyses confirmed that: (a) children’s trust beliefs in physicians predicted their adherence and quality of life; and (b) there were reciprocal predictive relations between the children’s and mothers’ trust beliefs in physicians. Quadratic relations were found at each testing time. The quality of life for children was lower when they had very low and very high adherence at T2 only and when the children and their mothers held very high and very low trust beliefs than when they held a middle range of trust beliefs.

**Conclusions:** The research showed that: (a) trust beliefs in physicians by children with asthma promoted their adherence and quality of life; (b) there was mutual child-mother socialisation of trust beliefs in physicians, and (c)
the burden of asthma temporarily suppressed the quality of life for those children and mothers with very high trust beliefs in physicians.

Ref: 1185 Empirical Poster Presentation
The mediation role of Language in the relationship between Emotion Comprehension and Theory of Mind in 4-year-old children
Renata Sarmento-Enriquez1, Beatriz Lucas-Molina2, Laura Quintanilla1, Marta Giménez-Dasi2
1NATIONAL UNIVERSITY OF DISTANCE EDUCATION, 2University of Valence

Objectives: Evidence on the relationships between emotion comprehension (EC) and Theory of Mind (ToM) is inconsistent. Language is an essential factor in these skills’ development. However, some studies addressing EC-ToM relationship, language is absent; in others, it is a covariate, and it is studied alternatively with EC or with ToM. The age of 4 is critical for false belief (FB) and EC understanding. We aim to model the relationship between EC, ToM, and language in four-year-olds, with a ToM scale that assess a more extensive range of measures (not only FB understanding).

Design: Non-experimental study. We measure three variables: Emotional comprehension (TEC: Pons and Harris, 2000), Theory of mind (ToM scale: Wellman and Liu, 2004), and Language (PLON-R, 2005).

Methods: Participants: 4-year-old Spanish children (N=92). Procedure: Individually, they were tested by trained interviewers. Data analysis: Mediation by PROCESS (Hayes, 2013).

Results: There was a significant indirect effect of emotion comprehension on theory of mind through language, b=.21, 95% CI [.09, .37].

Conclusions: The results indicate the mediation role of language on EC-ToM relationship. Language and EC share communicative properties to express internal states. In turn, language and ToM share intentionality and aboutness of mental states. Therefore, language is an essential tool for the development of these abilities at 4-years of age. Educative implications are discussed.

Ref: 1247 Empirical Poster Presentation
Mediation of Spirituality on Technology and Resilience Among the Filipino Youth
Margarita Maria Isabella Saulog, Hannah Mikaela Lazatin, Arvin Jose Simba, Emeral Jay Ilac, Ateneo de Manila University

Objectives: The study aimed to determine whether spirituality can mediate the relationship between social media and resilience in the Philippine context.

Design: A quantitative mediational design was used for this survey research.

Methods: A questionnaire containing three sections - spirituality, technology (specifically, social media) use, and resilience - was used. This was distributed to 105 students in the university level in Metro Manila. The gathered data was analysed for multiple linear regression for possible mediation.

Results: The multiple linear regression was found to be significant. A significant effect was found between social media use and resilience ($\beta=.41$), between social media use and spirituality ($\beta=.22$), and between spirituality and resilience ($\beta=.28$). However, no mediation was found using the Sobel test ($\alpha>.05$).

Conclusions: As suicide and depression rates rise partly due to stress, it is important to study factors that may help in one’s ability to deal successfully with stress. Resilience is one such factor that has shown to play a role in one’s ability to adapt to stress. With the support of many studies, spirituality and social media use were distinguished as factors of resilience. While linear regression was found to be significant among the three variables, the study failed to find corroborative results of mediation. Future studies may opt to widen the sample to include non-Christian or -Catholic institutions. This could broaden the range of spirituality within the sample. Other research possibilities may include an examination of possible moderation among the variables.
Adult grandchildren’s perspectives of the grandparent-grandchild relationship from childhood to adulthood
Carolina Sciplino, Melissa Kinshott, St Mary’s University

Objectives: The present study explores the nature of the relationships between grandparents and grandchildren in the United Kingdom. The aim of the study is to investigate adult grandchildren’s perspectives on the grandparent-grandchild relationship and its transition from childhood to adulthood.

Methods: A semi-structured interview design and a grounded theory approach of analysis were used. Ten participants, 1 male and 9 female aged 20-24 who had a relationship with at least one grandparent, were recruited by opportunity sampling.

Results: The results showed that adult grandchildren perceive the relationship to continue from childhood to adulthood and to transition in the following main areas: support, contact, attitude and emotion. Support in childhood was reported as being more practical such as caregiving or help with education whereas in adulthood as being more emotional. Contact was shown to be reduced from more frequent and face to face in childhood to less frequent and more telephone or internet based in adulthood. Motivation for contact in childhood was more influenced by parents whilst in adulthood it was reported to be initiated by the grandchild intending to provide support. As to attitude and emotion participants reported a change in how they felt towards their grandparents from childhood to adulthood, with feelings such as excitement being replaced with appreciation and respect. Implications of these transitions within grandparent-grandchild relationships are discussed.

Perception of non-native phonemic contrasts in Japanese children with autistic spectrum disorder (ASD)
Kaoru Shinozawa1, Tomoko Matsui2, Akiko Hayashi3, Takahiro Sekiguchi4, Hiroshi Fujino5, Yoshikuni Tojo6, Koichiro Hakarino

Objectives: Previous studies investigating perception of native and non-native phonetic contrasts in ASD children have yielded mixed results. Some report that ASD children had enhanced sensitivity to non-native phonemic contrasts (De Pape et al., 2012) and others suggest they did not (Constantino et al., 2007). The aim of the current study was to further investigate the characteristics of non-native speech perception in Japanese ASD children using British English /r-l/ /t-d/ contrasts.

Design: We used mixed factorial design with group as the between subject factor (ASD and control) and stimulus type (native or non-native phonemes, same or different phoneme pairs) as the within group factors.

Methods: Twelve school-aged children with ASD and 31 control children participated in the study. Participants heard pairs of stimuli (e.g. /ara/ and /ala/) spoken by the same speaker and were asked to judge whether each pair of the sound was the same or different. The /r-l/ contrast was used as a non-native phoneme pair and the /t-d/ contrast was used as a native phoneme pair for Japanese children.

Results: Children with ASD were more accurate than control children in discriminating the /r-l/ contrast (F (1,164) = 11.114, p < .01). By contrast, the two groups were equally accurate in discriminating the /t-d/ contrast (F (1,164) = 1.794, p = .182, n.s.).

Conclusions: Japanese children with ASD have shown increased sensitivity to non-native phonemic categories. Such sensitivity to non-native phonemic categories may be due to enhanced low-level perception (Mottron et al. 2006) or weak central coherence (Happe & Frith 2006).

Assessing the impact of the early home environment on learning
Victoria Simms1, Camilla Gilmore2, Aideen McParland1

Objectives: A number of studies indicate the importance of the home environment on academic achievement. In contrast to early literacy development there is a lack of evidence on the influence of the home environment on early
mathematical development and related skills. This study aimed to investigate the impact of the home environment on these outcomes in pre-school children.

**Design:** This study is part of a large scale intervention study.

**Methods:** 180 mothers were recruited into the Preparing for Life study. Home environment data was collected at 6, 18, 36 and 48 months using the Home Observation Measurement of the Environment (HOME) scale. The British Ability Scales were completed at 48 months; basic numeracy skills were assessed with the Early Numerical Concepts subscale and visuo-spatial skills were assessed with the Pattern Construction and Copying subscales. Socio-economic status (SES) was measured by household income and mother’s highest level of education.

**Results:** Home environment scores were significantly correlated across time points (all p’s < .05). Home environment scores were not significantly correlated with basic numeracy skills or pattern construction scores. Home environment and design copying scores were significantly correlated at 48 months (r= .161, n= 180, p= .05). Basic numeracy skills were significantly correlated with highest level of maternal education (rs= .169, n= 180, p= .045), but not household income. SES was not significantly related to visuo-spatial skills.

**Conclusions:** These results will be discussed in the context of the specificity of the influence of the home environment on early learning.

Ref: 1316 Review/ Theoretical & Practice Poster Presentation

Interventions to improve mathematics achievement in primary school-aged children: A systematic review
Victoria Simms\(^1\), Camilla Gilmore\(^2\), Claire McKeaveney\(^3\), Seaneen Sloan\(^4\)
\(^1\)Ulster University,  \(^2\)Loughborough University,  \(^3\)Queen’s University Belfast,  \(^4\)University College Dublin

**Purpose:** It is well established that many children struggle to meet expected levels in mathematics by the end of primary school (e.g. DE, 2015), which has led to increasing investment dedicated to developing effective interventions to improve mathematical achievement. However, there is a lack of systematic evidence concerning the effectiveness of these interventions.

**Background:** This study is a preregistered systematic review.

**Methods:** This review sought to identify effective interventions for improving mathematical achievement in primary school-aged children (aged 4-11 years). Only randomised controlled trials were included. Unlike previous reviews, this review focused on studies that did not select participants based on suspected or diagnosed mathematical difficulties. A systematic search strategy was implemented to identify studies that met the criteria for inclusion in the review.

**Conclusions:** 41 studies were included in the final narrative synthesis. A wide range of intervention types were identified under the following themes: conceptual understanding (N=6), practice for fluency (N=6), strategy use (N=3), number system knowledge (N=3), magnitudes (N=5), using manipulatives (N=2), technology for engagement (N=2), feedback (N=5), group work (N=2), delivery context (N=2), physical activity (N=3) and other interventions (N=2). The findings from this review provide a scientific evidence-base to inform and support decision making by teachers, head-teachers and policy makers in the use of mathematical interventions in the classroom across the achievement spectrum.

Ref: 1232 Empirical Oral Presentation

A novel way to explore young people’s views of society via their writing
Yvonne Skipper\(^1\), Richard Seymour\(^1\), Joseph Reddington\(^2\), Patrick Leman\(^3\)
\(^1\)Keele University,  \(^2\)E Quality Time,  \(^3\)Kings College London

**Objectives:** “White Water Writers” gives groups of young people the chance to plan, write, proofread and publish their own full length novel as a team. The process allows writers to explore issues through their novels, which creates an innovative methodology for exploring their view of society.

**Design:** The brief for the novels invited participants to write a story about something strange happening in their city and a group of friends who come together to solve the mystery. The books were then thematically analysed.

**Methods:** Sixty young people aged 15 wrote six novels based on this brief.

**Results:** Four main themes common to each of the books were identified. These were: anxiety, elitism, family and
change. Anxiety: The characters in the books were often confronted by uncertainty, chaos, and fear. Elitism: experts such as teachers, scientists and politicians proved themselves to be untrustworthy. Family: The traditional family was viewed with cynicism. Fathers tended to be unreliable, or worse. Friendship groups served as substitutes for family. Change: books often showed the transformation of ‘bad’ characters into ‘good’ ones, usually motivated by love or friendship.

Conclusions: The analysis suggests that writers produced novels which reflected issues which were important to them and used them as a space to explore their ideas. This suggests that this novel research methodology could be used to explore a range of topics.

Ref: 1182 Empirical Poster Presentation
The role of conceptual development in children’s analogical reasoning
Matthew Slocombe, Michael S. C. Thomas, Andrew Tolmie
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Objectives: How does conceptual development constrain children’s analogical reasoning? Hypothesis one: Children’s failure in analogy problems is in part a function of an underdeveloped conceptual system: Due to the relatively higher salience of object representations compared to thematic and relational representations, young children erroneously conceptualise analogy problems. Hypothesis two: The constraints that executive functioning place on analogical reasoning development are moderated by conceptual development.

Design: A cross-sectional design with 4-7-year-old children completing analogy problems and measures of conceptual and executive function development.

Methods: Participants: 120 typically developing 4-7-year-old children selected to capture the ‘relational-shift’ that characterises analogical reasoning development as well as changes in conceptual and executive functioning development. Materials: Analogy problems with category, thematic and relational responses. The British Picture Vocabulary Scale and a cued-recall task as measures of global conceptual development and associative conceptual strength respectively. A list-sorting working memory measure and the Hearts and Flowers and Real Animal Size Task inhibitory-control measures. Analysis one: A cluster analysis is being used to group participants by analogy problem response profile with a priori predictions that participants will cluster into three groups (category, thematic and relational matchers) with significant differences in conceptual development between each group. Analysis two: Conceptual development will predict number of relational matches in a regression model whilst controlling for executive functioning. Analysis three: Significant interactions will be observed between conceptual development and executive functioning in a regression model.

Results: Data will be discussed in terms of analogical reasoning and conceptual development theories.

Ref: 1181 Review/ Theoretical & Practice Oral Presentation
Towards a grounded cognition account of conceptual development
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Purpose: We propose a theoretical account of how conceptual development takes places within a grounded cognition conceptual system.

Background: A growing body of research in the field of grounded cognition argues that conceptual representations are composed of abstractions of sensorimotor information. Thus far, the majority of work in the field has focused on the compositional nature of representations and the adult processing of concepts and language with little published developmental work. Given that constructivist accounts of development place sensorimotor input as a key catalyst for developmental change, grounded cognition offers constructivism a mechanism of how sensorimotor input becomes instantiated in conceptual structure: A ‘schematic diagram’ of a representational ‘brick’ from which a rich and flexible and conceptual system can be constructed.

Methods / Conclusions: In this presentation, we describe how complex conceptual structures emerge within a grounded system through sensorimotor interaction with the physical environment and the assimilation of a culturally instantiated linguistic system. When conceptual development is conceived within a grounded system, a
theoretical path is formed that treads neatly within neuroconstructivist notions of partial representation and context-dependence, Vygotskian cultural entanglement, usage-based accounts of language development, and connectionist learning mechanisms. Supported by existing empirical work and supporting contended views of cognitive processing, a grounded account of development also offers novel mechanisms for the emergence of mental representations and the development of conceptual structures abstracted from concrete sensorimotor experience.

Ref: 1218 Empirical Poster Presentation

The lived experience of different memory systems in adults with dyslexia
James Smith-Spark, Elisa G. Lewis, London South Bank University

Objectives: Dyslexia-related difficulties with a range of memory systems are well-documented under laboratory conditions. Beyond the laboratory, there are self-report questionnaire data which indicate how memory problems may play out in daily life. However, the lived experience of adults with dyslexia employing their memory systems in day-to-day settings has not been explored. The current study sought to address this gap in the literature.

Design: A qualitative approach was used to explore university students with dyslexia’s experiences of memory.

Methods: One-to-one interviews were used to investigate experiences across different memory systems. Interviewees responded to questions relating to experiences with short-term and working memory, long-term memory, and prospective memory. Data were analysed using Thematic Analysis.

Results: Key themes arising from the data included participants’ reliance upon technology, such as mobile phone and audio recorders, to aid their studies. Participants described anxiety if they were to forget to take this technology to class. Memory difficulties also impacted upon social relationships. Friends and family supported the participants with their memories, as they were aware of weaknesses in this area. This was occasionally a source of irritation. The participants also reported recalling events differently from other people who were present.

Conclusions: These data lend support, and add greater depth, to current laboratory-based study findings and self-report questionnaires. They indicate that memory difficulties permeate the daily lives of adults with dyslexia. There is, thus, a need for a greater awareness of the potential impact of these difficulties in both educational and social settings.

Ref: 1286 Empirical Oral Presentation

Executive functioning problems in dyslexia: Evidence for a Supervisory Attentional System deficit?
James Smith-Spark¹, Rebecca Gordon²
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Objectives: This paper identifies the lines of evidence which have emerged over the past 10 or so years in support of the argument that there is a Supervisory Attentional System (SAS; Norman and Shallice, 1986) deficit in dyslexia.

Design: Smith-Spark and Fisk (2007) proposed that adults with dyslexia have a dysfunction of the Supervisory Attentional System (SAS; Norman & Shallice, 1986). The SAS is regarded as responsible for regulating and directing attention in order to control and promote behaviour consistent with known goals. It is equated with the central executive system (CES) and deficits in CES have also been shown in children with developmental dyslexia (e.g., Varvara, Varuzza, Sorrentino, Vicari, & Menghini, 2014). This paper examines evidence emerging from various strands of research over the past decade, finding support for a link between SAS impairments and dyslexia in adults.

Methods: This paper examines evidence emerging from research over the past decade, finding support for a link between SAS impairments and dyslexia in adults.

Results: Deficits in phonemic fluency, working memory, prospective memory, together with differences in syllogistic reasoning strategies, indicate ways in which SAS dysfunction may be implicated in dyslexia-related cognitive symptoms.

Conclusions: While these data are supportive of our argument, the weight of the evidence is, to date, indirect. We consider how more accurate measurement of SAS functioning can add to our understanding of the role of this cognitive ability in dyslexia in adulthood and how such deficits can be accounted for in everyday situations such as the workplace.
Ref: 1158 Empirical Oral Presentation
Can preschool children with communication impairments be identified as babies?
Helen Spicer-Cain, Nicola Botting, Natalie Hasson, City, University of London

Objectives: Up to 20% of children who have first degree relatives with communication difficulties will themselves experience social communication or language difficulties during childhood. As these difficulties can have far-reaching impacts on children’s later academic, employment and psychosocial outcomes, identifying early markers of later disorders is important, so that these children can receive earlier intervention.

Methods: 92 babies, including 39 at high-risk of communication difficulties, were assessed at a mean age of 13 months. A sub-sample was then followed up between 24 and 41 months of age, in order to investigate their pre-school language and communication outcomes. The children were assessed via observation, formal language assessment, parent questionnaires and a novel dynamic assessment procedure at both time points.

Results: The results from the first time point indicated that babies at high risk of social communication difficulties differed from controls on a wide range of measures. By contrast, babies at high risk of language difficulties were similar to controls on most infant measures, although there was evidence of dissociation between their language and social communication abilities in infancy. When the children’s own preschool-age language and social communication skills were considered, it was found that different patterns of deficit identified children with language delays and children with social communication disorders as infants.

Conclusions: This preliminary evidence that the early trajectories of language and social communication disorders may differ has important implications for differential diagnosis of children with communication difficulties. Markers that may allow for identification of these children in infancy will be discussed.

Ref: 1223 Empirical Oral Presentation
A prospective investigation of rumination and executive control in predicting over general autobiographical memory in adolescence
Tracy Stewart1, Sinead Rhodes1, Simon Hunter2
1University of Edinburgh, 2University of Strathclyde

Objectives: Given the significance of over general autobiographical memory (OGM) in understanding depression, an important research objective was to investigate the theoretical underpinnings of OGM, particularly during the adolescent developmental period associated with the onset of depression. The current study investigated two mechanisms of the CaR-FA-X model (Williams et al., 2007), rumination and executive control, in isolation and in interaction. We further investigated differences on OGM, depending on the subcomponents of rumination or the emotional stimuli used in the cognitive task.

Design: A two-wave, 6-month prospective study was employed to provide an understanding of the development of OGM over time.

Methods: 149 adolescents (13-16 years) were individually administered the minimal instruction autobiographical memory test, a computerised measure of emotional and nonemotional executive control, measures of reflective pondering, brooding rumination, depressive and anxiety symptoms during school hours, analysed with regression models and simple slopes analyses.

Results: The results showed reflective pondering significantly interacted with executive control when processing emotional information to predict OGM at follow-up, (β = −.28, p = .01). When reflective pondering was high, there was a significant negative relation between executive control and OGM, β = −.21 (95% CI = −.41, −.01), p = .04.

Conclusions: There are several theoretical and clinical implications. We add to the CaR-FA-X model by demonstrating the adaptive nature of reflective pondering on OGM, when executive control is low. Interventions aimed at increasing reflective pondering may serve to reduce OGM. This study provides a novel contribution to the field and requires validation.
Can big five personality traits predict child emotional and conduct problems among a Japanese child sample?  

Yusuke Takahashi, Kyoto University

**Objectives:** Particularly outside Western countries, much less is known about the longitudinal relationship between a child’s personality and adjustment problems.

**Design:** This study sought to investigate the links between children’s personality and problem behaviours, particularly emotional and conduct problems to examine if these relationships were replicated in the Japanese culture.

**Methods:** Our two-wave longitudinal sample included 236 children aged from 7 to 12 years old whose families were recruited across Japan through an Internet marketing company. At both two measurement time points with 2-year intervals, mothers reported on the child’s personality and problem behaviours. Child personality traits were assessed using the Hierarchical Personality Inventory for Children, and problem behaviours were assessed using the Strength and Difficulty Questionnaire.

**Results:** Hierarchical regression analysis showed that personality traits were related to problem behaviours even after controlling the covariates (i.e., child age and gender, education of mother, and household income). Specifically, higher emotional problems at wave 2 were predicted by higher Neuroticism at wave 1 (β = .37, p < .01), and higher conduct problems at wave 2 were predicted by lower Benevolence (Agreeableness) at wave 1 (β = −.51, p < .01).

**Conclusions:** These findings indicate that child personality can longitudinally contribute to their ability to adjust in life beyond the effect of mother and home demographics. As in Western countries, well-adjusted children tend to be emotionally stable and agreeable. Because only mother-reported measures were used in this study, multi-informant design was needed for future research.

**Ref: 1126 Empirical Oral Presentation**

**Toys with wheels: Do boys like them more than girls?**

Brenda Todd, City, Naz Altinok, City, University of London

**Objectives:** Most young children prefer toys typed to their own gender. Biological theories indicate that girls will be attracted to toys which afford nurturance including those with faces, whereas boys will prefer toys which afford
mechanical movement. Our aim was to assess whether preferences are driven primarily by gender stereotypes or by specific features which have differential appeal by child gender.

**Design:** In an observational study with forced choice design, eight gender-stereotyped toys were presented in pairs. Half of each toy category had a wheel and half a face feature.

**Methods:** 2-4 years-old children (n=37) were tested at nursery school. They were asked to choose freely from presented toy pairs and then complete a gender knowledge task.

**Results:** Consistent with previous work, children preferred toys typed to their own gender (F(1,35) = 24.66, p = .0001) and boys preferred wheeled toys. However, the preference for wheeled toys was also apparent in girls (boys, M = 5.24, SD = 1.48; girls, M = 5.05, SD = 1.50). Toys most frequently chosen by boys represented a car (20%) and tractor (18%) whereas girls’ favourites were a baby stroller (23%) and shopping trolley (17%). The tendency to choose gender-typed toys did not increase with participant age but scores on the gender knowledge task did.

**Conclusions:** Despite findings of sex-stereotyped preferences, there was no support for the proposition that pre-school girls would prefer toys with faces; like boys, they preferred wheeled toys. If wheeled-toy play enhances spatial awareness, should we encourage girls to engage with it more?

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**Ref: 1199 Empirical Poster Presentation**

The impact of colour blindness on children’s lives: a neglected research area.

Brenda Todd¹, Salina Begum¹, John Barry²

¹City, University of London, ²University College London, London

**Objectives:** Approximately 8% of males and 0.4% of females are colour blind, a condition apparent in childhood but not subject to routine testing. The impact of colour blindness on children is neglected in developmental psychology and educational practice. The current study aims to assess the difficulties faced in childhood and adolescence in order to discover participants’ lived experience and help us understand how colour blind children can best be supported.

**Design:** Semi-structured interviews were conducted in order to give voice to colour blind adults recalling their early experience. Open questions explored participants’ thoughts and feelings on diagnosis and their experiences in the family, school and peer group. Suggestions for improving outcomes for colour blind children were invited.

**Methods:** Seven colour blind adults, aged 18-30 (mean = 25) years took part in informal interviews lasting approximately 30 minutes in which they discussed their experiences.

**Results:** Thematic content analysis was used to assess the data. Themes included: feelings of difference, involving disadvantage and uniqueness: being the object of humour; difficulties in meeting challenges in school (e.g., use of colour coding in maths and science) and in daily life. Participants reported awareness of future career restrictions and the general lack of knowledge about of colour blindness in society.

**Conclusions:** The impact of colour blindness on children is considerable and can affect identity formation, impose a barrier to career plans and expose children to teasing and daily struggles, all of which are exacerbated by a lack of awareness by individuals, the education system and children themselves.

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**Ref: 1151 Empirical Poster Presentation**

The Role of Anxiety as a Mediator in the Relationship between Tic Severity and Quality of Life in Young People with Tic Disorders.

Marta Topor¹, Tammy Hedderly², Hayley Leonard¹, Sally Robinson³

¹University of Surrey, ²St Thomas’ Hospital, London

**Objectives:** Tic disorders are common neurodevelopmental conditions affecting around 5% of the population throughout lifetime. Tic severity and quality of life have been found to be associated in children with tic disorders. Additionally, recent studies report a relationship between tic severity and anxiety, and this may have a further negative effect on the quality of life. The current study aimed to test this potential mediation to determine whether anxiety may explain the relationship between tic severity and quality of life.

**Design:** The analyses were conducted as part of a clinical audit project at St Thomas’ Hospital, London during a pre-assessment process prior to patients’ first appointments. Analysis included a series of correlations and a mediation
**Methods:** The sample consisted of 38 young people aged between 8 and 15 years old with tic disorders and their parents/guardians. Cross-sectional data were collected from standardised self- and parent-report questionnaires on anxiety and quality of life. Tic severity was assessed by clinicians.

**Results:** Nearly 50% of the sample experienced significantly elevated anxiety and poor quality of life. The results confirmed the correlations found in previous studies. Anxiety was found to be a significant mediator of the relationship between tic severity and quality of life $b=-20.34$, 95% CI=38.17-7.22.

**Conclusions:** Anxiety is an important factor in tic disorders that explains a proportion of the variance shared between tic severity and quality of life. Clinicians dealing with tic disorders in children should be aware of the significance of anxiety, which should be considered during assessments and intervention planning.

**Ref:** 1144 Empirical Oral Presentation

**The effect of early communication environment on social, emotional, and educational outcomes for children without and without DLD**

Umar Toseeb¹, Jenny Gibson², Witold Orlik¹, Dianne Newbury³, Peter Clough⁴

¹University of York, ²University of Cambridge, ³Oxford Brookes University, ⁴University of Huddersfield

**Objectives:** To investigate the role of early communication environment on social, emotional, and educational outcomes in middle childhood for children with and without indicators of Developmental Language Disorder (DLD).

**Design:** Secondary analysis of existing data from the UK based Avon Longitudinal Study of Parents and Children (ALSPAC).

**Methods:** Children with and without DLD were identified using direct assessments of language when the children were aged 7 years old. Parental reports were used to measure early communication environment (0-2 years old) and social-emotional outcomes (11 years old). Latent class analysis was used to identify subgroups of children who shared similar early communication environments. Structural equation models were implemented to explore whether a child’s early communication environment directly and indirectly (via social factors) predicts social-emotional outcomes in middle childhood and whether these associations are different for children with and without indicators of DLD.

**Results:** A number of latent classes were identified with distinct patterns of early communication environment. Children who experienced a poor early communication environment in the first two years of life had poorer social-emotional outcomes in middle childhood compared to those with a good environment. This effect was independent of socioeconomic status. This association was partly mediated by social factors.

**Conclusions:** These findings suggest that a) early language and communication stimulation is important for social-emotional development and b) in the presence of a poor early communicative environment, it may be possible to ameliorate its negative effects on social-emotional outcomes by improving social factors.

**Ref:** 1140 Empirical Oral Presentation

**An Eye-Tracking Investigation of Developmental Differences when Children View Food Displays**

Jayne Trovati, Frances Maratos, Thomas Hunt, David Sheffield, University of Derby

**Objectives:** Younger children often consume a reduced variety of foods compared to older children. However, interventions to encourage healthy eating have only been moderately effective. Research demonstrates that children rely strongly on visual cues for food choices, but few studies have investigated visual attentional biases to food stimuli.

**Methods:** To address this, in the present study eye-tracking was used to explore the viewing patterns of 105 children of ages 4-5 (n=39), 7-8 (n=34), and 10-11 (n=32) when viewing five different food displays. These were: fruit, vegetables, breakfasts, snacks and carbohydrates. Importantly each display contained both familiar and novel food items, as did a control display of household objects.

**Results:** Results revealed three main findings. Firstly, all children viewed novel food items for significantly longer than novel control items. However, 7-8 year olds spent twice as long viewing the food displays, as compared to 4-5 year olds; conversely, 4-5 year olds spent significantly longer viewing the fruit display as compared with 7-8 year olds.
olds. These results demonstrate that all children spend longer looking at novel food items, compare with novel non-food items, but that age influences viewing preference. Here, younger children spend less time looking at foods per se, with the exception of fruit.

**Conclusions:** Building upon previous research, we tentatively suggest attentional processes may be involved in children’s food choices and potentially shape eating behaviours. To investigate this further, developmental variation for food viewing related to preferences should be investigated. This was a limitation of the present study.

**Ref: 1202 Empirical Oral Presentation**

**Four-year-olds’ working memory and inhibitory control can predict the development of communicative competence one year later**

Hiromi Tsuji, *Osaka Shoin Women’s University*

**Objectives:** Understanding that other people have different beliefs from one’s own beliefs is essential for false-belief understanding, and is pivotal for competent communication. The development of false-belief understanding has been associated with the development of executive functions (EFs) for preschool and younger school age children. However, it is not yet known whether the early development of EFs contributes to communicative competence.

**Design:** This longitudinal study investigated if any of the main EFs could predict communicative competence, independent of false-belief understanding.

**Methods:** 108 four year-old Japanese children participated in this two time-point, one-year study. The children’s EFs of working memory: digit span, inhibitory control: stroop and shifting of attention: dimensional change card sort, together with false-belief understanding were assessed at both times. Communicative competence was measured using the mindful-conversation difficulties scale (De Rosnay et al., 2014) at time 2.

**Results:** A regression analysis was performed for the communicative competence scores with explanatory variables of the EFs and receptive language. At time 1, working memory \((b = .25, p = .014)\) and inhibitory control \((b = .26 p = .017)\) but not shifting of attention predicted communicative competence one-year later and this was independent of false-belief understanding at time 2 \((b = .21, p = .049)\).

**Conclusions:** These results indicate that independent of false-belief understanding, children’s EFs could be used to predict communicative competence one year later. However, not all components of EFs play a part in predicting subsequent communicative competence, which supports the notion of diversity in the development of EFs.

**Ref: 1309 Empirical Poster Presentation**

**Is it possible to support pre academic skills development with an executive function training?**

Paola Viterbori, Maria Carmen Usai, Chiara Malagoli, Laura Traverso, *Department of education sciences University of Genoa Italy*

**Objectives:** The current study is aimed to ascertain the effectiveness and the cross-domain transfer of an executive function (EF) training (Traverso et al., 2015). Specifically, the effectiveness is investigated by verifying the training efficacy when regular teachers of preschool services administered the training; the cross-domain transfer is investigated by verifying the effect of the EF training on pre-academic skills.

**Design:** A between-group comparison (training versus control group) using analyses of covariance with the pre-test scores from each individual task as covariates was used to test training effects.

**Methods:** The sample comprehended a control group (43 children, \(\text{Mage} = 65.60; \text{S.D.} = 4.24; 47\% \text{females}\)) and an experimental group (51 children, \(\text{Mage} = 65.00; \text{S.D.} = 4.36; 41\% \text{females}\)). The groups were assessed with a large battery of EF and pre-academic skill tasks.

**Results:** The results revealed that children who took part in the training showed higher accuracy the Flanker task accuracy \([F (1,82) = 4.390; p = .039, d = .49]\), in the Hearts and Flower task accuracy \([F (1,89) = 13.814; p = .000, d = .52]\), in the Rapid Naming Task \([F (1,83) = 4.414; p = .039, d = .50]\) and in a Writing task \([F (1,80) = 5.145; p = .026, d = .54]\). In the case of the Writing task only the experimental group improvement was mediated by the EF improvement.

**Conclusions:** This study adds to the debate of the efficacy of EF trainings in pre-schoolers (Melby-Lervag & Hulme, 2013) and of the relation between EF and pre-academic skills (Jacob & Parkinson, 2015).
Facilitating symbolic understanding in children with autism spectrum disorder: The role of iconicity.
Bethany Wainwright¹, Melissa Allen², Kate Cain¹
¹Lancaster University, ²Bristol University

Objectives: This study investigated word-picture-referent learning in children with autism spectrum disorder (ASD): the aim was to determine if providing a 3D context and/or enhanced opportunities for engagement facilitated symbolic understanding.

Methods: Children viewed multiple coloured pictures of a novel object on an iPad in one of three viewing conditions: static 2D image; automatically rotating animation (providing 3D context and enhanced iconicity); and rotating animation in response to participant’s touch (3D context and enhanced iconicity plus enhanced physical engagement). In each condition, the picture was named with an unfamiliar word by the experimenter.

Results: To date, 18 children with ASD have completed the study. In a mapping stage, a similar proportion of children with ASD showed symbolic understanding in the 2D and 3D automatic conditions (83.3% vs 80%), however this was found to be less in the 3D manual condition (28.6%). In a generalization stage, a greater proportion of children with ASD showed symbolic understanding in the 3D automatic condition (80%), followed by the 2D condition (66.7%) and the 3D manual condition (14.3%). Data collection for the TD sample is ongoing and will later be compared to the ASD sample.

Conclusions: Together, these findings suggest that viewing a 3D automatically rotating image leads to greater generalization of learning than viewing a static 2D image; in contrast, allowing children to rotate the 3D image themselves does not benefit learning.

The Development of Social Interaction Perception in the Brain
Jon Walbrin, Ioana Mihaei, Julia Landsiedel, Kami Koldewyn, Bangor University

Objectives: The neural basis and development of face and body perception are well-studied, yet by comparison, only a few recent attempts have been made to identify the brain regions that underlie the perception of interactive behaviour between individuals. The current research investigated whether neural responses to observed social interactions differ between children and adults.

Design: We used functional magnetic resonance imaging (fMRI) to identify between-group differences in regional brain activation for children (6-12 years) vs. adults (18+ years), to social interaction video clips, along with several other categories of ‘social’ videos.

Methods: We MRI-scanned 60 neurotypical participants (adult n=30, child n=30) whilst they viewed a series of videos, allowing us to localise brain regions sensitive to observed social interactions, faces, bodies, and theory-of-mind (ToM) processing. Along with comparisons of whole brain activation, we also extracted focal responses (i.e. mean activation for each video category) in localised regions.

Results: We observed significantly weaker selectivity to interactions in children compared to adults (i.e. smaller differences between interaction and other social category responses in interaction regions). These results demonstrate that the neural activity underlying social interaction perception is not fully mature in pre-adolescent children.

Conclusions: These findings provide the first systematic look at how the neural responses underlying interaction perception change across development, and align with similar developmental findings for other categories of social information (e.g. faces, bodies, and ToM). These results serve as a baseline against which further research may investigate atypical development in disorders of social information processing, such as autism spectrum disorder.
Ref: 1297 Empirical Oral Presentation
Children’s facial emotion recognition: Associations with changes in patterns of lateralisation for emotion processing over 1 year
Dawn Watling, Nikoleta Damaskinou, Royal Holloway, University of London

Objectives: It is understood that children develop facial emotion recognition skills between early and late childhood (e.g., Bruce et al., 2000). It is also known that in this same time period that children become more right hemisphere lateralised for the processing of facial emotions (e.g., Workman et al., 2006). However, it is unclear if these two developments are related. This research assesses the association between patterns of lateralisation and developments in emotion recognition.

Design: We used a longitudinal design, assessing children at time point 1 and then again 1 year later. The same measures were used at both time points.

Method: 160 five to 12-year-olds completed an emotion discrimination, emotion matching, identity matching, and the chimeric faces task (a task to assess patterns of lateralisation).

Results: After controlling for time 1 task performance it was found that being more right hemisphere dominant at time 1 predicted emotion discrimination at time two, but that only changes in lateralisation (becoming more right hemisphere dominant) predicted time two emotion matching performance. Lateralisation did not predict identity matching performance. Further, findings show that the emotion discrimination task was easiest, followed by the emotion matching, and the identity matching task.

Discussion: Findings are discussed with reference to age and task difficulty, where with more difficult emotion tasks becoming more right hemisphere dominant for emotion processing led to better performance. This is the first longitudinal evidence that patterns of lateralisation for emotion processing is related to stronger facial emotion recognition performance.

Ref: 1301 Empirical Oral Presentation
Spontaneous mentalising in autism
Sarah J White, University College London

Objectives: Recent research has indicated that individuals with autism show a dissociation between spontaneous/implicit and explicit mentalising, the former being impaired whilst the latter is intact. Anticipatory looking paradigms used to tap into implicit mentalising ability have faced opposition, as they appear to be unreliable and contain confounds. Here, we attempt to overcome some of these issues, to elucidate whether autism is characterised by a specific implicit mentalising impairment.

Design: This is a 2x2 design, in which 2 groups of participants (autistic vs neurotypical) completed 2 conditions (true-belief (TB) vs false-belief (FB)).

Methods: 19 autistic adults and 21 neurotypical adults took part, comparable in age and IQ. We employed a multi-trial implicit mentalising task, including TB as well as FB trials. All participants also took part in an explicit mentalising task.

Results: Autistic adults displayed a weaker tendency than neurotypical adults to look at the belief-congruent area-of-interest (AOI) on both the TB and FB trials. The groups did not differ on the explicit mentalising task.

Conclusions: Individuals with autism surprisingly did not display a specific implicit mentalising impairment on the FB task, but rather showed a more general impairment on both belief monitoring tasks. Explanations for poor performance on the TB task will be explored, including motivation, attention, action prediction, reality bias, and intact visual perspective taking despite impaired mental perspective taking. Suggestions for future task modifications will be discussed.
Discrepancy between performances and understanding of distribution tasks in young children.
Yuko Yamana¹, Akira Nakagaki²
¹Akita University, ²Emeritus Professor of Waseda University

**Objectives:** The primary purpose of this study is to reveal the relationship between the young children’s performances of distribution tasks and their own expectation in advance.

**Design:** The 2 (anticipation vs. performance) X 6 (age groups) factorial design was adopted in which the former factor was within-subjects, and the latter between-subjects.

**Methods:** One hundred and thirty-nine children from 3 to 9 year-old children participated in our distribution experiment. Each participant basically had two tasks. The first task required the participants to anticipate their own results of the distribution task (how many chips should be distributed onto the plates in front of him/her). The second task asked them to conduct their requested distribution. In addition, there were two conditions in the second task under which the physical arrangements of the chips were variant.

**Results:** The results showed that their actual performances turned to be better than their own anticipations especially for our younger participants of preschool children. The discrepancy between the performance and its anticipation has decreased as the children get older. Finally there has been almost no discrepancy when the children become 9 years old.

**Conclusions:** That means the actual performances of the participants were more or less perfect except for the youngest age group although the anticipation task was very difficult for the preschool children.
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