



ASfAR
Australasian Society for Autism Research

Biennial Conference

December 4 & 5, 2014

Western Lecture Theatre

La Trobe University

Bundoora, Victoria

Hosted by the Olga Tennison Autism Research Centre



ASFAR Conference timetable overview

Venue: Western Lecture Theatres

Thursday 4 th December 2014	Friday 5 th December 2014	
9am – 10am Keynote – Prof Cathy Lord	9am – 10am Keynote – Dr Andy Shih	
10am-10.30am Morning tea + Posters	10am-10.30am Morning tea + Posters	
10.30am-12.30pm Concurrent Presentations Infancy /Sleep	10.30am-12.30pm Concurrent Presentations Adults /Intervention & Neuroscience	
12.30-1.30pm Lunch + Posters	12.30-1.30pm Lunch + Posters; incorporating ASFAR AGM; Database Discussion	
1.30 – 3.00 pm Concurrent Presentations Diagnosis/Cognition	1.30 – 2.45pm Concurrent Presentations BAP /Biological	CRC Poster Session with Prof Pat Howlin
	2.45 - 3.30pm Keynote – Prof Sue Leekam	
3.00 - 3.30pm Afternoon Tea	3.30 - 4.00pm Afternoon Tea including student prize presentations (Prof Margot Prior Paper Prize; Prof Laurie Poster Prize); APEX announcement	
3.30 – 4.45pm Concurrent Presentations Topics in Early Childhood I & II	4.00 – 5.30 pm OTARC Farewell drinks in the Foyer	
4.45 - 5.45pm Autism CRC Update		
6 - 7pm Pre-Dinner drinks – Eagle Bar		
7 pm -> Conference Dinner - Atrium/ Eagle Bar		

Thursday 4th December

9 – 10am

Keynote: Prof Cathy Lord

Chair: Cheryl Dissanayake

Early Regression and Worsening in Autism Spectrum Disorders

10 - 10.30am

Morning tea + Posters (30)

Concurrent Session 1

Concurrent Session 2

Infancy & Toddlerhood
Chair: Josephine Barbaro

10.30 – 10.45 Hudry et al.
Response to dynamic eye gaze: A neural marker for autism in 6-month olds?

10.45 - 11.00 Lane et al.
Temperament and sensory features in infants at risk of autism: A retrospective video analysis study

11.00 – 11.15 Lane et al.
Sensory subtypes in toddlers with risk factors for Autism Spectrum Disorder (ASD).

11.15 – 11.30 Wang et al.
Developmental surveillance of infants and toddlers: Early identification of Autism Spectrum Disorders in Tianjin, China

11.30 - 11.45 Magiati et al.
Autistic traits in an unselected sample of Singaporean pre-school children using the Q-CHAT: individual differences and psychometric properties of the Quantitative-Checklist for Autism in Toddlers (Q-CHAT)

11.45 – 12.00 Magiati et al. (GAN, D.)
A prospective longitudinal investigation of early precursors of social and non-social autistic traits in a community sample of 18-month-old Singaporean toddlers

12.00 – 12.15 Hancock et al.
Differences in Diagnostic Decisions of Autism Spectrum Disorder across Professionals within Community Settings

12.15-12.30 Clark et al.
A longitudinal study of cognitive development in children diagnosed with Autism Spectrum Disorder (ASD) at 24 months of age

Sleep
Chair Amanda Richdale

10.30 – 10.45 Davis et al.
Do ASD Symptoms at 2 Years Influence the Prediction of Childhood Sleep Problems and Anxiety from 2- to 8-Years?

10.45 - 11.00 Pasula et al.
Malaysia-Australia Autism Sleep Health Program: Collaborative Cross-cultural Research with Children with Autism Spectrum Disorder (ASD) and Typical Development

11.00 – 11.15 Richdale et al
Are Sleep Difficulties in ASD related to Delayed Development, GI symptoms, Medical Comorbidities or ASD Symptom Severity

11.15 – 11.30 Mertins et al.
Investigating Diet, Behavioural, Gastrointestinal and Sleep Problems in Children with and without Autism Spectrum Disorder.

11.30 – 11.45 Thomas et al.
Behavioural sleep problems in children with ASD-ADHD

11.45 – 12.00 Papadopolous et al.
The effectiveness of brief behavioural sleep intervention in school aged children with autism: A pilot randomized control trial

12.00 – 12.15 Rinehart et al.
Active Kids: Improving our understanding of health, sleep, physical activity and motor development in young children with Autism.

12.15-12.30 Baker et al.
Sleep Patterns in Adults with a Diagnosis of Autism Spectrum Disorder: A Preliminary Analysis

12.30 - 1.30pm		Lunch + Posters	
<p>Diagnosis Chair: Katrina Williams</p> <p>1.30 – 1.45 Bent et al. Mapping the diagnosis of Autism Spectrum Disorders by age 7 in Australia: 2010 – 2012</p> <p>1.45 – 2.00 Brignell et al. Autism Spectrum Disorder: Presentation and prevalence in a nationally representative Australian sample.</p> <p>2.00 – 2.15 Carrington et al. Essential behaviours for the diagnosis of DSM-5 Autism Spectrum Disorder</p> <p>2.15 – 2.30 Christiansz & Gray The Application of DSM-5 Criteria in Toddlers with Autism and Developmental Delay</p> <p>2.30 – 2.45 Green et al. Autism Spectrum Disorder symptoms in children with Attention Deficit/Hyperactivity Disorder: A community-based study.</p>	<p>Cognition, emotion and postural control Chair: Jon Brock</p> <p>1.30 – 1.45 Palmer et al. Perceptual inference in autism and the rubber-hand illusion</p> <p>1.45 – 2.00 Landry et al. A meta-analysis of Wisconsin Card Sort Task performance in autism.</p> <p>2.00 – 2.15 Fanning et al. Specificity and prevalence of working memory deficits in ASD and Williams Syndrome</p> <p>2.15 – 2.30 Nuske et al. Reduced pupil dilation indicates difficulties in learning from others emotions in young children with autism</p> <p>2.30 – 2.45 Trimmer et al. Feeling it on the inside but not on the outside: Emotional empathy in ASD</p> <p>2.45 – 3.00 Foster et al. Fundamental differences in postural control in adults with autism</p>		
3.00 - 3.30pm		Afternoon Tea	
<p>Topics in Childhood I Chair: Trevor Clark</p> <p>3.30 – 3.45 Dissanayake et al. The Development of Pretend Play in Young Children With and Without an Autism Spectrum Disorder (ASD)</p> <p>3.45 – 4.00 Stirling et al. Interactional Aspects of Pretend Play with Children with ASD</p> <p>4.00 – 4.15 O'Brien Parents' perceptions of how of their child with ASD interacts with different family members</p> <p>4.15 – 4.30 Ahmed et al. Comparison of adaptive behaviors: Findings from Bangladeshi children with and without autism</p> <p>4.30 – 4.45 Granich et al. Overweight and obesity rate and related characteristics of children with Autism Spectrum Disorder</p>	<p>Topics in Childhood II Chair: Kristelle Hudry</p> <p>3.30 – 3.45 Crea et al. Proband mental health difficulties and parental stress predict mental health in toddlers at high-risk for Autism Spectrum Disorders</p> <p>3.45 – 4.00 Magiati et al. Which autism symptoms predict different anxiety symptoms in children with ASD? Findings from a cross-sectional and a one year follow-up study</p> <p>4.00 – 4.15 Ashburner et al. Bullying Experiences of Students with Autism Spectrum Disorder: Comparing the Perceptions of Adolescents and their Parents</p> <p>4.15 – 4.30 Unwin et al. A prospective ultrasound study of prenatal growth in infant siblings of children with autism.</p>		
4.45 pm-5.45 pm		Autism CRC Update	
6pm-7pm	Pre-dinner drinks at the Eagle Bar		
7pm ->	Conference Dinner Atrium/Eagle Bar		

9am – 10am

Keynote: Dr Andy Shih
Chair: Cheryl Dissanayake

Global Autism Public Health (GAPH) Initiative: Implementation Science and the Global Autism Movement

10am-10.30am

Morning tea + Posters

Concurrent Session I

Concurrent Session II

Adults
Chair: Sylvia Rodger

10.30 - 10.45 Howlin
Outcomes in adulthood for individuals with autism- an analysis of findings from recent research

10.45 – 11.00 Holmes & Young
The presentation of Autism Spectrum Disorder in Adulthood

11.00 – 11.15 George & Stokes
Sexual Orientation and Gender-Identity in High-Functioning Individuals with Autism Spectrum Disorder

11.15 – 11.30 Wade & Kronborg
Impact of autism on abilities and achievement in highly able individuals

11.30 – 11.45 Foley et al.
Access to primary health care and problems managed for people with autism spectrum disorder

11.45 – 12.00 Rodger & van Dooren
Engaging Individuals with ASD and their Families using Inclusive Research Practices

12.00 – 12. 15 Lilley
Experiences of School Choice and Change for Mothers of Students Diagnosed with Autism

12.15 – 12.30 Buday et al.
Sleep Quality and Daytime Dysfunction in Mothers and Fathers of Children with Autism Spectrum Disorder and Typical Development in Malaysia

Intervention
Chair: Deb Keen

10.30 - 10.45 Vivanti et al.
Feasibility, effectiveness and predictors of outcome of children receiving the Early Start Denver Model in a group-based community childcare setting

10.45 – 11.00 Paynter et al. & Green
Knowledge and Use of Evidence-Based Practices in an Australian Early Intervention Service

11.00 – 11.15 Bailey et al.
Effects of computer-assisted literacy instruction on reading abilities of children with ASD

11.15 – 11.30 Grant et al.
Early analysis of a randomized controlled trial of a web-based Autism Decision Aid for parents of children newly diagnosed with ASD

Neuroscience
Chair: Peter Eenticott

11.30 – 11.45 Johnson et al.
Disrupted functional connectivity in dorsal and ventral attention networks during attention orienting in autism spectrum disorders

11.45 – 12.00 Kirksovski et al.
Sex differences in structural and functional connectivity in ASD

12.00 – 12. 15 Chouinard et al.
A study on visual and semantic fMRI-adaptation using a normal range analogue of autism.

12.15 – 12.30 Lane
Robust features for the automatic identification of autism spectrum disorder in children

12.30 - 1.30pm Lunch + Posters incorporating ASFAR AGM & Database Discussion		
<p>Broader Autism Phenotype Chair: Mark Stokes</p> <p>1.30 – 1.45 Jamnadas et al. The perinatal androgen:estrogen ratio and autistic-like traits in the general population: a longitudinal pregnancy cohort study</p> <p>1.45 – 2.00 Tan et al. Sexually dimorphic facial features varying according to levels of autistic-like traits in the general population</p> <p>2.00 – 2.15 Stokes & Dove Effects of Alcohol use and the broader autism phenotype</p> <p>2.15 – 2.30 Chouinard et al. Dissociable visual perception and executive functioning processes in typically developing adults with varying degrees of autistic-like characteristics.</p> <p>2.30 – 2.45 Cheung et al. Ambiguity in narratives: Low-AQ and high-AQ individuals process ambiguity in narratives differently.</p>	<p>Biological Aspects Chair: Andrew Whitehouse</p> <p>1.30 – 1.45 Hollier et al. Perinatal Testosterone Exposure and Cerebral Lateralisation in Adult Males: Evidence for the Callosal Hypothesis</p> <p>1.45 – 2.00 Christino et al. An integrative genomics approach to studying autism spectrum disorders: from genetic variation to molecular mechanisms.</p> <p>2.00 – 2.15 An et al. Characterization of autism spectrum disorders using exome sequencing and complex networks analysis</p> <p>2.15 – 2.30 Bodin et al. The gastrointestinal micro-biome in Autism Spectrum Disorder</p> <p>2.30 – 2.45 Seger et al. Investigating gut dysfunction in ASD: Expression of Neuroligin-3 in mouse small intestine.</p>	<p>CRC Poster Session with Prof Pat Howlin Discussant</p> <p>Hatfield et al; van Dooren et al;</p> <p>Costley & Haas</p> <p>Rene et al.</p> <p>Nicollet et al.</p> <p>Scott et al.</p> <p>Rabba et al.</p>
<p>2.45 - 3.30pm Keynote: Prof Sue Leekam Chair: Margot Prior Perspectives on autism as a spectrum</p>		
<p>3.30 - 4.00pm Afternoon Tea including student prize presentations (Prof Margot Prior Paper Prize; Prof Laurie Poster Prize) and APEX announcement</p>		
<p>4.00 – 5.30 pm OTARC Farewell drinks in the Foyer</p>		

Thursday 4 th December 2014	Friday 5 th December 2014
Posters Day 1 (28)	Posters Day 2 (29)
<p>Toddlerhood Hudry et al; Grant et al; Hedley et al;</p> <p>Identification & Diagnosis Mozolic-Staunton et al; Davis et al; Maya et al; Klopper et al; Wong & Hwan; Grove et al; Lane & Tanner</p> <p>Language Kam et al; Yeo SL</p> <p>Motor Jukes et al; Hocking et al; May et al;</p> <p>Experimental Alvares et al; Caulfield et al; Fiene & Brownlow; Bekkali et al; Donaldson P et al; English et al</p> <p>Methods Carr; Ilais et al</p> <p>Mixed Garrick & Winter x 2; Nutting;</p>	<p>CRC Posters Hatfield et al; van Dooren et al; Costley & Haas; Rene et al; Nicollet et al; Scott et al; Rabba et al.</p> <p>Intervention Sung et al; Date et al; Jurgens et al; Gately; Dass et al; Mills & Chapparo; Albein-Urios & Enticott; Ashburner & Vickerstaff</p> <p>Family Yeo R et al; Ahmed & Dissanayake; Uljaravic et al</p> <p>Adults Costley & Bruck; Chen et al; Baker & Richdale</p> <p>Animal Models Burrows et al; Drinkwater et al; Russo et al; Buntine et al;</p> <p>Biological Shindler et al; Williams et al; Donaldson R & Bishop</p>

Presentation Instructions

- Oral Presentations are allocated 15 minutes (approximately 12 for presentation and 3 for questions).
- Poster Presentations are divided across the two days, with posters put up at the beginning of each day and left for the duration of the day.
- Ideally your poster would be maximum 90cm wide x 120cm high in a vertical format.
- Pins will be provided.

Abstracts and Biographies for ASFAR 2014 keynote speakers



Professor Catherine Lord

Abstract

Early Regression and Worsening in Autism Spectrum Disorders

Autism is defined by difficulties in three areas: the quality of social reciprocity, communication, and restricted and repetitive behaviors, as well as onset prior to 36 months. However, the form of onset before 36 months has not yet been specifically determined. Research suggests that many children who at later ages will meet formal diagnostic criteria for autism will not necessarily show clear difficulties in all three areas at young ages. Our research and clinical work has asked whether autism can reliably be diagnosed in children as young as two years, is there a reason to distinguish autism from more broadly defined autism spectrum disorders at these young ages and what are the trajectories of development associated with autistic spectrum disorders beginning under 3 years of age. The focus is on both positive (abnormal) behaviors and negative (the absence of abnormal) behaviors, which means that developmental level and contextual effects have to be taken into account. Research suggests that it is possible to diagnose autism reliably at age two. However, there is much more variability, particularly in children with less certain diagnoses, than there will be years later. The clinical and educational implications of these findings will be discussed.

Biographical Summary

Catherine Lord, Ph.D. is the Director of the Center for Autism and the Developing Brain a joint project of New York - Presbyterian Hospital, Weill Cornell Medical College, Columbia University College of Physicians and Surgeons in partnership with New York Collaborates for Autism. She completed degrees in psychology at UCLA and Harvard, and a clinical internship at Division TEACCH at the University of North Carolina at Chapel Hill.

Dr. Lord is a licensed clinical psychologist with specialties in diagnosis, social and communication development and intervention in autism spectrum disorders (ASD). She is renowned for her work in longitudinal studies of social and communicative development in ASD. She has also been involved in the development of standardized diagnostic instruments for ASD with colleagues from the United Kingdom and the United States (the Autism Diagnostic Observation Schedule (ADOS) an observational scale; and the Autism Diagnostic Interview – Revised (ADI-R) a parent interview), now considered the gold standard for research diagnoses all over the world.

Dr. Lord was the Chair of the National Research Council's Committee on the Effectiveness of Early Intervention in Autism and is a member of the DSM5 Neurodevelopmental Disorders Committee.

Her work at the Center for Autism and the Developing Brain involves continued research in validity and longitudinal studies, early diagnosis of children with autism, and regression in children with autism and clinical evaluations and diagnoses of children and adults who may have autism.



Dr Andy Shih, PhD

Senior Vice President, Scientific Affairs
Autism Speaks

Abstract - Global Autism Public Health (GAPH) Initiative: Implementation Science and the Global Autism Movement

In the 7 years since the passage of World Autism Awareness Day resolution at the UN, the dramatic increase in autism awareness around the world has led to additional historic autism resolutions at the United Nations General Assembly (UNGA) and the World Health Assembly (WHA). Together, these resolutions provide the developmental framework to inform the growing Global Autism Movement's priorities and activities. Over 60 countries, including many LMICs, are now working with Autism Speaks to develop policy and community-based solutions via the Global Autism Public Health (GAPH) initiative, an innovative public health program that integrates awareness, advocacy and research. GAPH's current strategy, process and impact will be discussed, as well as future directions and priorities to help meet the needs of over 85% of individuals and families in our global community.

Biography

Andy works closely with members of Autism Speaks' Board, Scientific Advisory Committee, senior staff and volunteer leadership to develop and implement the organization's research program. He oversees the public health portfolio, which includes Autism Speaks' Global Autism Public Health Initiative, an international advocacy and development effort currently active in over 60 countries around the world that integrates awareness, research, and service development. Andy and his team serve as technical advisor to ministries and other government agencies by facilitating multi-stakeholder collaboration and sourcing needed content expertise with the goal of delivering community-based feasible, cost-effective and sustainable solutions.

Andy's research background includes published studies in gene identification and characterization, virus-cell interaction, and cell-cycle regulation. He was instrumental in the cloning of a family of small GTPases involved in cell-cycle control and nuclear transport, and holds three patents on nucleic acids-based diagnostics and therapeutics. Prior to focusing on Autism Speaks' public health/international development efforts, Andy oversaw the organization's investments in genetics, environmental sciences, epidemiology and assistive technologies.



Professor Sue Leekam

Abstract

Title: Perspectives on Autism as a Spectrum

Although autism has long been described as a spectrum by both clinicians and researchers, the official description of *Autism Spectrum Disorder* (ASD) has only recently been specified by DSM-5 criteria. The description of ASD as a spectrum raises several questions about the utility of this concept. Do the DSM-5 criteria identify the same children and adolescents who would receive a diagnosis according to DSM-IV-TR/ ICD-10? Is the DSM-5 description similar to the spectrum approach that is already used in practice? And is the severity of particular 'core' symptoms of ASD related to other associated psychiatric and behavioural problems? I will first review research findings based on both DSM-5 and Wing & Gould's perspectives of autism as a spectrum. Then I will focus on two 'associated' symptoms maladaptive behaviours and anxiety. Given the recent challenges to DSM-5 classification, I consider how new ways of thinking about autism as a 'spectrum' may help to move us beyond traditional categorical and severity models, which have become standard approaches for research.

Biography

Professor Susan Leekam holds the Chair in Autism at Cardiff University and is the Director of the Wales Autism Research Centre. She was previously Professor of Developmental Psychology at Durham University and Senior Lecturer at the University of Kent and she began her postdoctoral career as a researcher at La Trobe University. Her research focuses on cognitive, social and behavioural development in autism with a recent focus in attention, sensory processing and repetitive behaviours. She has expertise in identification and diagnosis and has published the diagnostic interview schedule, the Diagnostic Interview of Social and Communication Disorders (DISCO) which is now used worldwide by clinicians.



ASFAR Conference
Oral Presentations

Presenting Author: AHMED, Nusrat Yasmeen

Title: Comparison of adaptive behaviors: Findings from Bangladeshi children with and without autism

Affiliation: Director, Hope Autism Center, Bangladesh, and
ASD Specialist **Early Assessment Clinic**,
Olga Tennison Autism Research Centre
La Trobe University, Bundoora, Victoria 3086 Australia

Co Authors: Monowara Parveen

Background: Assessing adaptive behaviors of children is important to know their personal and social sufficiency; strengths and needs. This is also essential for planning intervention programs for special need children. This study compared the adaptive behaviors of Bangladeshi children with ASD and without ASDs.

Method: Data were collected from 75 children of two Autism Centers and one regular school in 2012 and 2013. 40 children had ASDs and 35 did not. Their age and sex; any current diagnosis of physical or mental disability; and the social, communication and daily living activity domains of **Vineland Adaptive Behavior Scale** were used to collect data.

Results: Daily living domain had largest mean difference (45 VS 89.33) between these two groups. Communication and socialization domain had the highest scores (both 59) when three mean domain scores were compared within ASD group. NT group had the highest mean score on socialisation domain (93). ASD group's highest sub-domain mean score (9.8) was on receptive communication, whereas in typically developing group it was school subdomain (18). The lowest subdomain mean score for ASD children was academic (5) and for typically developing group it was personal (9.33) subdomain.

Conclusions: ASD children's comparatively higher scores in receptive communication (which is contradictory to other study results) and school subdomain indicate their comparative strengths in understanding others' communication, listening, paying attention and following rules and routines. The wide difference between written and academic subdomains shows that intervention planning also needs to be focused on generalisation and real life use of numbers and time.

Dr Nusrat Yasmeen Ahmed - N.Ahmed@latrobe.edu.au

Monowara Parveen - parveen@yahoo.com

Dr Giacomo Vivanti - G.Vivanti@latrobe.edu.au

Presenting Author: AN, Joon-Yong

Title: Characterization of autism spectrum disorders using exome sequencing and complex networks analysis

Affiliation: ¹Queensland Brain Institute, University of Queensland
²School of Pathology and Laboratory Medicine, Perth, WA, Australia;
³State Child Development Centre, Child and Adolescent Health Service,
Princess Margaret Hospital for Children, Perth, WA,
⁴Telethon Institute for Child Health Research, Centre for Child Health
Research, University of Western Australia,
⁵Cooperative Research Centre for Living with Autism Spectrum Disorders (Autism CRC), Long Pocket
Campus, the University of Queensland, QLD, Australia

Co Authors: Alexandre S. Cristino¹, Sarah Williams¹, David Ravine², John Wray³,
Andrew J.O. Whitehouse^{4,5}, Charles Claudianos^{1,5}

We recently reported a hypothetical gene network model that was used to profile the functional patterns of heterogeneous DNA variants overrepresented in ASD, X-linked intellectual disorder (XLID), attention deficit and hyperactivity disorder (ADHD) and schizophrenia. We have applied the AXAS model to analyze whole exome sequencing data from an Australian ASD cohort. We have shown how combinations of loss-of-function variants cluster in functional processes and putatively contribute to the causal profile of individuals with an ASD. We also showed how DNA variants inherited from parents with a broader autism phenotype (BAP) and de novo variants have a significant association with ASD. Gene ontology analysis revealed that putative rare causal variants cluster in key neurobiological processes and are overrepresented in functions involving neuronal development, signal transduction and synapse development. We have demonstrated how a complex gene network model can be used to fine map combinations of inherited and de novo variations in families with ASD that converge in the L1CAM pathway involved in axon guidance. Our results provide an important step forward in the molecular characterization of ASD with potential for developing a tool to analyze the pathogenesis of individual affected families.

Funded by Cooperative Research Centre for Living with Autism Spectrum Disorders (Autism CRC).

Presenting author: ASHBURNER, Jill

Title of presentation: **Bullying Experiences of Students with Autism Spectrum Disorder: Comparing the Perceptions of Adolescents and their Parents**

Affiliations: Autism Queensland, The University of Queensland

Co-author: Beth Sagers, QUT

Background: Previous research has suggested that students with ASD commonly experience bullying. This study aimed to compare students with ASD and their parents in terms of: (a) reported frequencies of face-to-face- and cyber-bullying experiences, (b) their level of concern about bullying, (c) factors that contributed to reported bullying frequencies and level of concern about bullying.

Method: Student and parent surveys were sent to 613 families of adolescents with ASD aged 11-16. Participants were asked about the frequency of the student's bullying experiences in the previous 6 months and their level of concern about bullying. In order to measure their understanding of bullying, participants were asked to determine whether examples of student interactions could be classified as bullying.

Results: Completed surveys were returned by 102 families. The students and parents reported similar rates of bullying, including more frequent victimization than bullying others, and more frequent face-to-face than cyber-bullying. The parents were significantly more worried about bullying than the students. Students with an anxiety disorder or suspected anxiety disorder (but not their parents) were significantly more likely to report face-to-face victimisation and were significantly more worried about it. No significant relationships were found between either the parents' or students' reports or concerns about bullying, and the presence of co-morbid ADHD or depression or their understanding of bullying.

Conclusion: Although parents were more concerned about bullying, they reported bullying incidents at similar rates to their children. Anxious students worried more about face-to-face bullying than other students, and were more likely to report it.

Jill Ashburner - Jill.Ashburner@autismqld.com.au

Presenting Author: BAILEY, Benjamin

Title: **Effects of computer-assisted literacy instruction on reading abilities of children with ASD**

Affiliation: The University of Sydney

Co-authors Joanne Arciuli, Roger Stancliffe

Background: The current study presents the first known examination of the effects of ABRACADABRA (CSLP, 2009) on the reading skills of children with ASD. ABRACADABRA is a free, evidence-based web application designed to promote skills related to reading accuracy and comprehension. We hypothesized that children with ASD who received ABRACADABRA instruction would exhibit improved reading abilities relative to a wait-control group of children with ASD.

Methods: 20 children diagnosed with ASD, aged 5-10 years, were allocated to an instruction or wait-control group. Groups were matched on measures of language, reading and adaptive ability. Participants in the instruction group received 26 hours of ABRACADABRA instruction over 13 weeks. Standardised assessments were administered prior to (T1) and following (T2) the instruction period to measure the effects of ABRACADABRA on participants' reading abilities.

Results: 2 x 2 ANOVAs showed significant interactions between Time (T1 vs. T2) x Group (Instruction vs. Control) on measures of word-level reading accuracy, $F(1, 18) = 5.73, p = .028, \eta^2 = .241$, passage-level reading accuracy, $F(1, 18) = 10.50, p = .005, \eta^2 = .368$, and passage-level reading comprehension, $F(1, 18) = 10.59, p = .004, \eta^2 = .370$. These patterns of results revealed improvements for the instruction group relative to the wait-control group.

Conclusions: Results support the hypothesis that children with ASD would benefit from ABRACADABRA literacy instruction. Given the potential clinical utility of computer-assisted literacy instruction for children with ASD, further studies of freely accessible applications will be of continued interest to parents and educational professionals alike.

Benjamin Bailey – bbai4795@uni.sydney.edu.au

Assoc Prof. Joanne Arciuli – joanne.arciuli@sydney.edu.au

Prof. Roger Stancliffe – roger.stancliffe@sydney.edu.au

Presenting Author: BAKER, Emma

Title: Sleep Patterns in Adults with a Diagnosis of Autism Spectrum Disorder: A Preliminary Analysis

Affiliation: Olga Tennison Autism Research Centre, La Trobe University

Co-authors Amanda Richdale

Background: Sleep problems commonly occur in individuals with Autism Spectrum Disorder (ASD). To date, most research in this area has focused on children and adolescents or combined samples of adolescents and young adults. Consequently, very little is known about the sleep difficulties experienced by adults with ASD.

Methods: 15 adults with ASD ($M_{\text{age}} = 34.10$, $SD = 5.36$) and 15 age- and sex-matched neuro-typical (NT) adults ($M_{\text{age}} = 32.26$ years, $SD = 4.67$) completed an online questionnaire battery, 14-day sleep/wake diary, and 14-day actigraphy assessment.

Results: Preliminary analyses showed that adults with ASD had shorter sleep duration (diary; $p = .02$ and actigraphy; $p = .01$), later bedtimes (diary; $p = .02$), and longer sleep onset latencies (actigraphy; $p = .03$). ASD adults also had larger difference scores between their desired and actual bedtimes ($p = .02$) and reported lower refreshment scores upon waking in the morning ($p = .02$). All effect sizes for group differences were large. Sleep refreshment scores were correlated with sleep onset latency measures (diary; $r = -.57$, $p = .03$ and actigraphy; $r = -.53$, $p = .04$), and diary sleep efficiency ($r = .54$, $p = .04$) in the ASD group.

Conclusions: These preliminary findings show that sleep problems continue into adulthood in individuals with ASD and that poor sleep has a negative impact on daytime functioning. Data has now been collected for 35 adults with ASD and is currently being analysed and will be available at the time of presentation.

Emma Baker - ek4baker@students.latrobe.edu.au

Presenting Author: BENT, Catherine

Title: Mapping the diagnosis of Autism Spectrum Disorders by age 7 in Australia: 2010 – 2012

Affiliation: Olga Tennison Autism Research Centre, La Trobe University

Co-authors Cheryl Dissanayake, Josephine Barbaro

Background: The early diagnosis of young children with Autism Spectrum Disorder (ASD) is critical to ensure access to early intervention services. ASD can be accurately and reliably diagnosed by 24 months; however, diagnosis often does not occur until a later age.

Objectives: The frequency and age of diagnosis (AoD) of ASD in children, under 7 years, living in Australia was investigated to examine trends across states, metropolitan, regional and remote areas and the child characteristics of sex, diagnosis type, Indigenous, and cultural minority group status.

Methods: Secondary de-identified data regarding 15,096 children aged 0 – 7 years registered through the national Helping Children with Autism Package between 2010 and 2012 were utilised.

Results: Across Australia, 0.74% of the population of children aged 0-7 are currently diagnosed with ASD. The average age of diagnosis of ASD (by age 7 years) was 49 months, with the most frequently reported diagnostic age being 71 months. Differences were evident in the frequency of ASD and average AoD across states and between major cities, regional and remote areas. There was no difference in AoD between Indigenous and non-Indigenous Australians, but children from a culturally and linguistically diverse background were diagnosed 5 months earlier than other children.

Conclusions: The current AoD of ASD in Australia indicates a substantial gap between the age at which a reliable and accurate diagnosis is possible, and the age at which most Australian children are diagnosed with ASD. Findings suggest that the incidence of ASD in Australia has increased substantially from previous estimates.

Catherine Bent - c.bent@latrobe.edu.au

Presenting Author: BODIN, Oonagh

Title: The gastrointestinal microbiome in Autism Spectrum Disorder

Affiliation: 1. Department of Microbiology, La Trobe University
2. Department of Physiology, University of Melbourne

Co-authors: Dr Elisa HILL-YARDIN², Prof Joel BORNSTEIN²,
Dr Ashley FRANKS¹, Dr Naomi BISHOP¹

The microbial community of the gastrointestinal tract plays a large role in our health and wellbeing. The gastrointestinal microbiome has been implicated in a variety of roles including development and maintenance of our immune system, gut motility and has also been suggested to play a role in brain function and development, via the gut-brain axis. The gastrointestinal microbiome is dynamic and various factors including age, diet and genetics have been suggested to have a role in the establishment and maintenance of its composition.

Dysfunction of the gastrointestinal tract is a co-morbidity of autism spectrum disorder (ASD). Up to 93% of individuals diagnosed with ASD experience gastrointestinal problems. These symptoms can range from mild to severe abdominal pain to vomiting, reflux, constipation and/or diarrhea.

A mutation that disrupts synaptic function has been identified in the gene encoding neuroligin 3 (*Nlgn3*). This mutation has previously been detected in children with ASD. To investigate whether the *Nlgn3* R451C mutation plays a role in the development of gastrointestinal dysfunction, a transgenic mouse model with this mutation has been used.

I will present the current findings from my research on the composition of the gastrointestinal microbiome in wild-type and mutant mice. These changes were investigated from the beginning of weaning to maturity. By 10 weeks of age significant differences were seen in the overall composition of the gastrointestinal microbial fingerprint of the mouse model. The use of a genetically defined mouse model allows us to conclude that our findings were not due to environmental factors, but the mutation itself.

Oohagh Bodin - o.bodin@latrobe.edu.au

Presenting Author: BRIGNELL, Amanda

Title: Autism Spectrum Disorder: Presentation and prevalence in a nationally representative Australian sample.

Affiliation: The University of Melbourne, The Royal Children's Hospital,
The Murdoch Children's Research Institute,
Olga Tennison Autism Research Centre, La Trobe University.

Co-authors: Melinda Randall, Emma Sciberras, Amanda Brignell,
Elfriede Ihsen, Daryl Efron, Cheryl Dissanayake,
Katrina Williams

Aim: In two nationally representative samples of Australian children born in 1999-2000 and 2004-2005 we examined the prevalence of parent-reported autism spectrum disorder (ASD) diagnosis and the developmental profile of children with ASD compared to their peers.

Method: Data were used from Wave 4 of the Birth (B; 6-7 years) and Kindergarten (K; 10-11 years) cohorts of the Longitudinal Study of Australian Children (LSAC) (N~5000 in each cohort). Measures included: parent-reported ASD diagnosis; Strengths and Difficulties Questionnaire; Pediatric Quality of Life Inventory 4.0; Matrix Reasoning (Wechsler Intelligence Scale for Children IV); and [Peabody Picture Vocabulary Test III](#).

Results: Parents reported 107 children (2.6%) and 92 children (2.4%) in B and K cohorts respectively, as having an ASD diagnosis. In both cohorts children with ASD had poorer quality of life, emotional-behavioural functioning and receptive language compared with non-ASD controls. However, 10%, 70% and 79% of children identified with ASD did not have social difficulties, receptive language and cognitive scores in the clinical range, respectively.

Conclusion: More than 2% of children were reported by parents to have a diagnosis of ASD. While children with ASD, on average, had more difficulties than their peers in areas usually associated with autism, not all of them fell within a clinical range. Although LSAC did not use autism-specific tools, the current findings raise questions about the types of problems being considered when diagnosing ASD. These questions require further investigation to clarify the prevalence of ASD in Australia, and to inform assessment and intervention service planning.

Amanda Brignell - amanda.brignell@rch.org.au

Presenting Author: BUDAY, Tuba

Title: Sleep Quality and Daytime Dysfunction in Mothers and Fathers of Children with Autism Spectrum Disorder and Typical Development in Malaysia

Affiliation: Jeffrey Cheah School of Medicine and Health Sciences,
Monash University, Malaysia

Co-authors: Kim Cornish, Clare Anderson, Kartini Ilias and
Karen Jennifer Golden

Note: *Kim Cornish and Clare Anderson are affiliated with the School of Psychological Sciences, Faculty of Biomedical and Psychological Sciences, Monash University Australia
Kartini Ilias and Karen Jennifer Golden are affiliated to the same university as the presenting author.*

Children with Autism Spectrum Disorder (ASD) have been reported to have greater sleep problems compared to children with Typical Development (TD). As development is impacted by interactions between family, society, and culture, investigations into child sleep should consider sleep in the family as a whole and examine the role of culture. Problematically, limited sleep or ASD research has been conducted in collectivist, non-Western cultures and previous sample sizes of fathers was small. This study aimed to explore sleep quality and daytime functioning in mothers and fathers of primary school-aged children with ASD and TD. In Malaysia, 230 participants were recruited, including 91 parents of children with ASD (53 mothers, 38 fathers) and 139 parents of children with TD (82 mothers, 57 fathers).

Multivariate analyses of the Pittsburgh Sleep Quality Index (PSQI) and Children's Sleep Habits Questionnaire (CSHQ) subscales was conducted. The association between parents' sleep and daytime dysfunction was also explored by correlating PSQI scores with scores on the Fatigue Severity Scale (FSS), Epworth Sleepiness Scale (ESS) and Loughborough Occupational Impact of Sleep Scale (LOISS). As hypothesized, preliminary results illustrate that parents of children with ASD have lower sleep quality, higher fatigue, daytime sleepiness and negative impact on occupational functioning than parents of children with TD. Poor sleep was also associated with greater daytime dysfunction in the ASD and TD cohorts. The findings inform recommendations regarding the impact of culturally-specific signatures of sleep, which can lead to more culturally-competent services based on indigenous data rather than relying on Western-based samples.

Tuba Buday - tuba.buday07@gmail.com

Presenting Author: CARRINGTON, Sarah

Title: Essential behaviours for the diagnosis of DSM-5 Autism Spectrum Disorder

Affiliation: Wales Autism Research Centre, Cardiff University

Co-authors Rachel G. Kent, Jarymke Maljaars, Ann Le Couteur,
Judith Gould, Lorna Wing, Ilse Noens,
Ina Van Berckelaer-Onnes, Susan R. Leekam.

Background: Despite initial concerns about the sensitivity of the diagnostic criteria for DSM-5 Autism Spectrum Disorder (ASD), evidence is growing that the criteria provide both good sensitivity and specificity (e.g. Frazier et al., 2012; Kent, Carrington et al., 2013). The capacity of the criteria to provide good sensitivity and specificity, however, relies on careful measurement to ensure that appropriate items from diagnostic instruments map onto the DSM-5 descriptions.

Objective: To use an existing diagnostic algorithm to identify a set of 'essential' behaviors sufficient for reliable, accurate diagnosis of DSM-5 ASD.

Methods: Specific behaviors were identified and tested from the recently published DSM-5 algorithm (Kent, Carrington et al., 2013) for the Diagnostic Interview for Social and Communication Disorders (DISCO). Analyses were run on existing datasets ($n=335$). Predictive validity was tested using ROC curves and sensitivity across age and ability was investigated in a subset of individuals ($n=190$).

Results: Study 1 identified a set of 48 items with good predictive validity, but which lacked sensitivity for higher ability individuals. An adjusted item set (54 items) improved sensitivity for higher ability individuals and performance and was comparable to the published DISCO DSM-5 algorithm (Study 2).

Conclusions: This work represents a first attempt to derive a reduced set of behaviors for DSM-5 directly from an existing standardized ASD developmental history interview. Further work is required to replicate these findings and exploit their potential to contribute to more efficient and focused diagnosis.

Sarah Carrington - carringtonsj@cardiff.ac.uk

Presenting Author: CHEUNG, Candy Sau Chi

Title: Ambiguity in narratives: Low-AQ and high-AQ individuals process ambiguity in narratives differently.

Affiliation: School of Psychology, University of Western Australia

Co-authors: Ullrich K. H. Ecker, Murray T. Maybery

Background: There have been suggestions that individuals with Autism Spectrum Disorder (ASD) differ from typical individuals when processing narratives involving ambiguity. Previous research investigating this issue has focused largely on processing negations or misleading information rather than ambiguity within a narrative per se. The aim of this study was to investigate how the understanding of an unfolding fictitious scenario is affected by ambiguity in individuals with low and high levels of autistic-like traits.

Methods: Undergraduates (N=280) pre-screened on the Autism-spectrum Quotient (AQ) were recruited to form low-AQ (AQ range 1 to 14) and high-AQ (AQ range 22 to 40) groups. Participants read a fictitious scenario that consecutively presented two unrelated but not mutually exclusive causal explanations for a single event; in some conditions, one of the causes was retracted.

Results: When ambiguity remained in the fictitious news report (i.e., when neither cause was retracted), low-AQ individuals tended to refer to the most recent cause presented and thus disambiguated the apparent confusion. High-AQ individuals, on the other hand, did not exhibit such behaviour, and were equally likely to refer to either cause in their responses.

Conclusion: The current data suggest that low-AQ and high-AQ individuals behave differently when presented with ambiguous information within a narrative. Low-AQ individuals appeared to rely on the most recently-presented cause in an attempt to relieve ambiguity, whilst high-AQ individuals appeared to have no preference for either cause, suggesting they may prefer not to disambiguate the confusion or have difficulty in doing so.

Candy Cheung - candy.cheung@research.uwa.edu.au

Presenting Author: CHOUINARD, Philippe

Title: A study on visual and semantic fMRI-adaptation using a normal range analogue of autism.

Affiliation: School of Psychological Science, La Trobe University, Bendigo, Victoria, Australia.

Co-authors: Oriane Landry (Department of Psychology, Neuroscience & Behaviour, McMaster University, Hamilton, Ontario, Canada)
Melvyn Goodale (The Brain and Mind Institute and the Department of Psychology, The University of Western Ontario, London, Ontario, Canada).

Background: Autistic individuals are thought to focus more on the visual than the semantic features of objects. To explore this idea, we conducted an fMRI-adaptation experiment in which we examined visual and semantic processing in the brains of two groups of normal adults classified as low or high on the Autism Spectrum Quotient (AQ) questionnaire.

Methods: Twelve participants with low AQ (5 females, AQ range: 3 to 11, Age range: 21 to 31) and twelve participants with high AQ (5 females, AQ range: 25 to 40, Age range: 18 to 36) participated in the study. In these two groups, we carried out a behavioral priming experiment and an fMRI-adaptation experiment. In both experiments, we had participants identify pairs of line drawings of objects presented in succession that consisted of either: the same exemplar of an object, different exemplars of the same object, or two completely different objects.

Results: Although the two AQ groups showed the same amount of visual and semantic behavioural priming, the patterns of visual and semantic fMRI-adaptation in key brain areas were quite different. Random-effects voxel-wise and ROI analyses revealed that visual fMRI-adaptation was greater in the fusiform bilaterally for the high-AQ group compared to the low-AQ group whereas semantic fMRI-adaptation was greater in the pre-supplementary motor area for the low-AQ group compared to the high-AQ group (all $p < 0.05$). No other differences were found between groups.

Conclusions: These results suggest that brain areas that extract the visual characteristics of objects are more engaged in people with a greater number of autistic-like traits than in those with fewer. Conversely, brain areas that attach semantic meaning to these same objects are more engaged in people with fewer autistic-like traits than those with more. This may mean that in autism spectrum disorders the brain areas that process the visual features of objects are recruited more strongly than are areas that process the semantic features of objects.

Philippe Chouinard - p.chouinard@latrobe.edu.au

Presenting Author: CHOUINARD, Philippe

Title: Dissociable visual perception and executive functioning processes in typically developing adults with varying degrees of autistic-like characteristics.

Affiliation: School of Psychological Science, La Trobe University, Bendigo, Victoria, Australia.

Co-authors: Karisa Parkington (Department of Psychology and Neuroscience, Dalhousie University, Halifax, Nova Scotia, Canada).
Becky Clements (Department of Psychology and Neuroscience, Dalhousie University, Halifax, Nova Scotia, Canada).
Oriane Landry (Department of Psychology, Neuroscience & Behaviour, McMaster University, Hamilton, Ontario, Canada).

Background: Visual discrimination has been noted as a particular strength for individuals with an Autism Spectrum Disorder (ASD) whereas executive functioning processes have been recognised as a relative weakness in this population. The purpose of this study was to examine how performance on an associative learning task was affected in the normal population as a function of scores on the Autism Spectrum Quotient (AQ) questionnaire.

Methods: University students learned a visuomotor association task with Japanese hiragana visual stimuli and button responses. In the first condition (called the no pre-familiarization condition) 50 participants (43 females, age range 17 – 27 years, AQ range 6 – 27) learned the visuomotor associations without any prior familiarization with the stimuli's visual attributes. Under this set of circumstances, visual perception skills afforded an advantage. In the second condition (called the pre-familiarization condition) 50 participants (39 females, age range 18 – 29 years, AQ range 7 – 35) completed a session in which they became familiar with the stimuli's visual appearances prior to completing the visuomotor association learning task. Under this set of circumstances, executive function afforded an advantage.

Results: Participants with greater degrees of sub-clinical autistic-like traits had a clear advantage in the no pre-familiarization condition. The bin at which learning criterion was achieved correlated negatively with overall AQ ($r(48) = -0.282, p = .047$). In contrast to the latter condition, participants with fewer sub-clinical autistic-like traits had a clear advantage in the pre-familiarization condition. The bin at which learning criterion was achieved correlated positively with overall AQ ($r(48) = 0.329, p = .019$).

Conclusions: This study unveils a dissociation between visual perception abilities versus executive functioning skills across the AQ spectrum that mirrors a behavioural pattern that is seen in individuals with ASD.

Philippe Chouinard - p.chouinard@latrobe.edu.au

Presenting Author: CHRISTIANSZ, Jessica

Title: The Application of DSM-5 Criteria in Toddlers with Autism and Developmental Delay

Affiliation: Centre for Developmental Psychiatry & Psychology
Department of Psychiatry, School of Clinical Sciences
Monash University

Co-authors: Kylie Gray

The diagnostic criteria for Autism Spectrum Disorder (ASD) were recently revised in the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Early research utilising the draft DSM-5 criteria indicated that some children, particularly young children, may be less likely to receive a DSM-5 diagnosis of ASD. The present study therefore aimed to investigate the impact of the DSM-5 on diagnostic classification in toddlers aged 20 to 55 months. The sample included children with a DSM-IV diagnosis of Pervasive Developmental Disorders (PDD) and a comparison group of children without a PDD. The role of comorbid developmental delay, age, and DSM-IV diagnostic subtype was examined in relation to agreement across the two sets of DSM diagnostic criteria. Autism symptomatology was assessed using the Autism Diagnostic Observation Schedule (ADOS) and the Autism Diagnostic Interview-Revised (ADI-R). A consensus diagnosis was made according to DSM-IV-TR criteria based on all available information from the assessment. ADOS and ADI-R items were mapped onto the published DSM-5 criteria. The results are discussed in terms of sensitivity and specificity. Further analyses explored which children would be less likely to receive a DSM-5 diagnosis of ASD. The potential implications of the diagnostic changes are discussed.

Jessica Christiansz - jagoo3@student.monash.edu

Presenting Author: CRISTINO, Alexandre

Title: An integrative genomics approach to studying autism spectrum disorders: from genetic variation to molecular mechanisms.

Affiliation: Queensland Brain Institute, The University of Queensland

Co-authors: Joon-Yong An; Sarah Williams; Charles Claudianos

In spite of advances in genomics high-throughput technologies that help identify the genetic variations associated with autism spectrum disorders (ASD), it has become evident that a useful interpretation of genetic mutations requires a better understanding of how these risk factors affect molecular pathways and promote the onset of ASD. In the current study we propose a novel integrative approach to examine the molecular basis of neurodevelopmental and neuropsychiatric disorders. Our model integrates genetic data, functional genomics and complex network concepts in a computational framework describing genes and their functional pathways associated with mental disorders including ASD, X-linked intellectual disability (XLID), attention deficit hyperactivity disorder (ADHD) and schizophrenia (SZ) – also known as AXAS network model (Cristino et al. 2013 Molecular Psychiatry). More recently we have updated the AXAS model to include other mental disorders (epilepsy, Alzheimer’s and Parkinson’s diseases) and new protein-protein interaction data. Surprisingly the updated AXAS model was not only successful in predicting the correct association of various cohort genetic data but also in predicting the correct association of co-expressed genes from studies using ASD- and SZ-derived induced pluripotent stem cells. Our study provides a comprehensive map of the gene regulatory networks that could be used to select candidate genes for experimental validations, predict spatio-temporal gene expression patterns in the human brain associated with ASD and discover individual drug-gene associations.

Alexandre S. Cristino - a.cristino@uq.edu.au

Presenting Author: CLARK, Megan

Title: A longitudinal study of cognitive development in children diagnosed with Autism Spectrum Disorder (ASD) at 24 months of age

Affiliation: Olga Tennison Autism Research Centre, La Trobe University

Co-authors Cheryl Dissanayake, Josephine Barbaro

Background: The ability to identify and diagnose ASD at increasingly earlier ages offers the opportunity to track their development from toddlerhood. Few longitudinal studies are available which follow children with ASD to school age. The current longitudinal investigation focused on the cognitive development of a cohort of children diagnosed with an Autism Spectrum Disorder (ASD) at 24 months with the aim of exploring continuity and change in their cognitive profiles from 24 months to middle childhood. An additional aim was to identify which early behavioural and developmental variables contribute to cognitive outcomes at school age

Methods: Thirty children aged between 7- to 9-years comprise the sample and each child was previously assessed at 24- and 48-months of age on the Mullen Scales of Early Learning. The WASI was administered at their school age follow-up.

Results: A one-way repeated measures ANOVA was conducted to ascertain developmental gains across time (24-months, 48-months and 7-9 years). A significant effect for time was identified. Results revealed Individual variability in cognitive trajectories. A mean gain of 39 IQ points from 24 months to 7-9 years was found, with some children making greater gains than others; one child gained as many as 51 IQ points. Regression analyses investigated which early factors contributed to cognitive outcomes at school age. Results conclude NVMA (24-months) and years of early intervention were the strongest predictors of cognition at 7-9 years. Charting the trajectories provides a greater understanding of the rate and pattern of cognitive development in a cohort of children with ASD from toddlerhood to middle childhood. Identifying early predictors of later cognitive outcomes will assist in the development of appropriate interventions to enhance early skill acquisition, minimising the effect of ASD on the developmental course.

Megan Clarke - ml6clark@students.latrobe.edu.au

Presenting Author: CREA, Katherine

Title: **Proband mental health difficulties and parental stress predict mental health in toddlers at high-risk for Autism Spectrum Disorders**

Affiliation: Olga Tennison Autism Research Centre, La Trobe University

Co-authors Kristelle Hudry, Cheryl Dissanayake.

Children at familial high-risk for Autism Spectrum Disorders (ASD) may be also be at heightened risk for mental health difficulties. Whilst family-related risk factors, such as maternal depression and harsh disciplinary practices, are known risk factors for later mental health difficulties in typically-developing children, little is currently known about family-related mental health risk factors in toddlers at high-risk for ASD. Hence, this study investigated family-related predictors of mental health problems among 30 2-year-old toddlers at familial high-risk for ASD and 28 low-risk controls, all followed longitudinally to 3-years of age. All toddlers completed developmental assessments at 2- and 3-years of age, whilst toddlers in the high-risk group were also assessed for ASD at 3-years. Parents completed the self-report Depression Anxiety Stress Scales, and also the Behaviour Assessment System for Children for both toddlers and probands. Probands with ASD and their parents had higher rates of reported mental health difficulties compared to their low-risk counterparts. Parent stress and proband mental health difficulties predicted concurrent toddler mental health difficulties at 2-years, but only baseline proband internalising problems continued to predict toddler internalising problems at 3-years; high-risk status did not confer additional risk. Baseline toddler mental health difficulties robustly predicted later such difficulties, while high-risk status and diagnostic outcome conferred no additional risk. This study highlights the increased risk of mental health difficulties amongst various members of families affected by ASD, and points to the importance of utilising a family systems perspective for understanding toddler mental health difficulties.

Katherine Crea - katcrea@gmail.com

Presenting Author: DAVIS, Jacquie

Title: **Do ASD Symptoms at 2 Years Influence the Prediction of Childhood Sleep Problems and Anxiety from 2- to 8-Years?**

Affiliation: (1) School of Psychological Science, La Trobe University,
(2) Olga Tennison Autism Research Centre, La Trobe University
(3) University of Melbourne

Co-authors: A. L. Richdale² and S. M. Cotton³

Both anxiety and poor sleep are common in children with ASD and more frequent than in typically developing children. We examined the influence of early symptoms of ASD on sleep and anxiety and the prediction of sleep problems and anxiety from age 2- to 8-years. Data were from the Western Australian Pregnancy Cohort (Raine) Project, which recruited 2900 pregnant women between 1989 and 1991. Demographic information and information on children's behaviour (Child Behavior Checklist [CBCL]) were available. In this study we extracted relevant demographics, and children's sleep, anxiety and ASD symptoms at 2-years and sleep and anxiety at 8-years. Sleep, anxiety and ASD symptoms at 2-years and sleep and anxiety at 8-years were all significantly correlated. Four hierarchical multiple regressions, two with sleep at 8-years and two with anxiety at 8-years as dependent variables were conducted. The four final models were significant. Anxiety and sleep at 2-years and sleep at 8-years uniquely predicted anxiety at 8-years, and sleep at 2-years and anxiety at 8-years uniquely predicted sleep at age 8-years, with the 8-year-old variables explaining the most variance. ASD symptoms at 2-years was a unique significant predictor of anxiety 8-years. Two demographic variables also contributed significantly to the prediction of sleep at 8-years. Results support that childhood sleep problems and anxiety are interrelated. Children who currently present with either problem are likely to experience difficulties with the other. Importantly, early ASD symptoms were related to both sleep and anxiety, and contributed significantly to anxiety later in childhood.

Jacqui Davis – J.davis4@latrobe.edu.au

Presenting Author: DISSANAYAKE, Cheryl
Title: The Development of Pretend Play in Young Children With and Without an Autism Spectrum Disorder (ASD)
Affiliation: Olga Tennison Autism Research Centre, La Trobe University
Co-authors: Mahwish Choudry & Josephine Barbaro

Background: Recent studies have shown that pretend play in children with high functioning ASD is not as severely impaired as previously suggested (Prescott, 2005; Kelly, 2007; Mifsud, 2012). However, deficits in pretend play have been found to be highly predictive of an autism diagnosis at 24 months of age (Barbaro & Dissanayake, 2012). Taken together, these findings suggest that the development of pretence maybe different in children with ASD as compared to other groups. The objective in this study was to investigate the development in pretend play in children with ASD from toddlerhood to preschool years using a longitudinal sample.

Method: We utilised secondary data from a community-based study which focused on the prospective identification of ASD. The sample comprised 76 children (53 ASD; 23 DD/LD) who were assessed at both 24- and 48-months. Spontaneous pretend play and functional/goal directed play and was coded as well as adult assisted play.

Results: The two groups performed comparably on each play type and the mean bout length of play increased from 24- to 48-months of age in each group. Pretend play was found to be related to verbal and non-verbal abilities in children with ASD at each age, and this relationship was found to be unidirectional with cognitive abilities at 24-months predicting pretend play at 48-months in children with ASD.

Conclusion: The results show that the development of pretence in children with and without ASD was similar, and also support a General Cognitive Development Hypothesis of pretence development. Together, they indicate that pretence is not a specific deficit in ASD.

Cheryl Dissanayake - c.dissanayake@latrobe.edu.au

Presenting Author: FANNING, Peter
Title: Specificity and prevalence of working memory deficits in ASD and Williams Syndrome
Affiliation: La Trobe University – School of Psychological Science
Co-authors: Dr Giacomo Vivant, Dr Darren Hocking

Background: Research into the role of working memory in the etiology of learning difficulties in ASD has focussed almost entirely on moderate to high function individuals leaving the role of working memory in low functioning autism largely unexplored. Even within the limited scope of previous research a consensus on working memory deficits has not been reached. A small number of recent studies examining low functioning autism in comparison with other developmental disorders have shown links to working memory deficits and raise two key questions: how important is the role of working memory in ASD across the spectrum and how specific are these deficits to ASD?

Methods: The present study will employ eye tracking technology and a novel language independent task that can be administered to children with ASD across the spectrum and to children with Williams Syndrome (WS). Individual differences in working memory performance will be examined within groups in relation to disorder severity and between groups for links to intellectual capacity and adaptive function.

Results/Conclusion: Analyses are underway. It is hypothesised that working memory deficits in both groups will be linked to intellectual and adaptive outcomes. However, given the inconsistency of previous findings in ASD and the relative agreement on working memory deficits in WS, the relationship is expected to be more pronounced in WS than in ASD. It is further expected that the results of this study will illuminate the role of working memory in intellectual and adaptive outcomes in ASD and WS thus providing guidance on treatment targets and pedagogical approaches that are moderated by individual differences in working memory.

Peter Fanning - 17985141@students.latrobe.edu.au

Presenting Author: FOLEY, Kitty-Rose

Title: Access to primary health care and problems managed for people with autism spectrum disorder

Affiliation: 1. Department of Developmental Disability Neuropsychiatry, School of Psychiatry, UNSW Australia
2. Family Medicine Research Centre, School of Public Health, Sydney Medical School, University of Sydney, Australia

Co-authors: Janelle Weise¹, Allan Pollack², Helena Britt² & Julian Trollor¹

Purpose: There is little known about the unique needs of, and accessibility to, appropriate healthcare for persons with autism spectrum disorders (ASD). This study therefore aims to identify the patient demographics and their reasons for encounters, the problems managed, length of consultation, and the clinical treatments provided within primary health care at encounters with people with ASD, compared to encounters with the general population.

Method: The Bettering the Evaluation and Care of Health (BEACH) program collects information about the clinical activities in Australian general practice. Each year the program recruits a random sample of about 1,000 general practitioners (GPs), each of whom collects data on 100 consecutive consultations. This study explores the data collected April 2000 – March 2014.

Encounters at which at least one ASD (n = 678) was recorded as a reason for encounter and/or a problem managed, will be compared to all other BEACH encounters (n = 1,359,989). Age-sex standardisation will be applied to these data.

Results: Results will indicate if there are differences between groups in the reasons for encounter, problems managed and the types of clinical treatments provided. We will compare whether encounters with ASD patients had more problems managed or longer consultation times than encounters with the general population.

Conclusion: People with an ASD have complex health care needs that require a skilled general practice workforce with adequate resources to deliver high quality care. The results from this research will have the potential to guide policy, service delivery models and workforce planning.

Kitty-Rose Foley - K.Foley@unsw.edu.au

Presenting Author: FOSTER, Chris

Title: Fundamental differences in postural control in adults with autism

Affiliation: Curtin University, WA

Co-authors Simon Rosalie, Torbjorn Falkmer, Sue Morris

Differences in development of fundamental motor skills are commonly reported in Autism Spectrum Disorders (ASD). Motor skills require adequate postural control which is itself dependent on effective sensory processing. This study compared how adults with ASD and typically developed adults (TDI) responded to a proprioceptive in quiet standing under four visual conditions. Vibration (100 hz) was applied to dorsal neck muscles in burst of 5 seconds between breaks of 15 seconds in series over 200 seconds. The availability of visual information was manipulated by having participants wear liquid crystal spectacles that became opaque on cue during vibration and/or no vibration periods. The proprioceptive illusion is thought to work by providing a subconscious proprioceptive cue from neck muscle vibration to the postural control system that the head is moving backwards and the adaptation is to shift the COM forwards to maintain balance.

Adults with ASD used proprioceptive information to control posture by leaning forwards during the vibration illusion and backwards between vibrations (all groups vibration vs no-vibration $p < 0.0001$) in the same way as TDI (Vision occluded condition [VOVO], $p = 0.527$). When visual information was available there were significant differences between the groups ($p < 0.01$). Where TDI adults used visual information to correct the proprioceptive illusion (TDI: VOVO vs vision available $p < 0.0001$) the adults with ASD did not (ASD: VOVO vs vision available $p = 0.6973$). We suggest that differences in movement and social functioning are related through deficits in processing visual information. Utilising proprioceptive strategies in teaching both may improve outcomes for those with ASD.

Chris Foster - c.foster@student.curtin.edu.au

Presenting Author: GEORGE, Rita

Title: Sexual Orientation and Gender-Identity in High-Functioning Individuals with Autism Spectrum Disorder

Affiliation: Deakin University

Co-authors:

Background: Clinical impressions indicate a sexual profile within the Autism Spectrum Disorder (ASD) population unlike that seen in the general population that is suggestive of a wide range of sexual orientations and an overrepresentation of gender-dysphoria. We therefore hypothesized that there would be an increased prevalence of non-heterosexual orientations and increased gender dysphoria.

Method: We surveyed sexual orientations with the Sell Scale of Sexual Orientation, and gender-dysphoric symptomology with the Gender Identity and Dysphoria Questionnaire, in an international sample of individuals with ASD ($N = 129$, $M=40$, $F = 89$), aged ($M=31.8$ years, $SD=12.2$) and compared these rates to those of typically-developing individuals ($N = 212$, $M = 58$, $F= 154$), aged ($M=27.2$ years, $SD=10.2$).

Results: When compared to controls, individuals with ASD demonstrated higher sexual diversity, more issues with gender-identity, and higher gender-dysphoric symptomology. When compared to heterosexual ASD individuals, ASD persons with an alternative sexual orientations were more likely to report the gender of their romantic partner as not important, experienced better friendship quality and higher social satisfaction with peers of the opposite-sex than with the same-sex, lower levels of personal well-being, and higher rates of depression, anxiety and stress. Overall, individuals who identified with an alternative sexual orientation and reported gender-identity deviance demonstrated a higher loading of ASD traits.

Conclusions: Individuals with ASD may be ambivalent about gender, which may be related to autistic-type cognition/behaviors and social experiences. This may be one of the factors underlying the high prevalence of alternative sexual orientations among in ASD.

Rita George - rita.george@deakin.edu.au

Presenting Author: GRANICH, Joanna

Title: Overweight and obesity rate and related characteristics of children with Autism Spectrum Disorder

Affiliation: Telethon Kids Institute, The University of Western Australia

Co-authors Ashleigh Lin, Anna Hunt, John Wray and Andrew Whitehouse

Background: Childhood overweight and obesity is a significant risk for poor health. Children with autism spectrum disorder (ASD) might be at a greater risk for overweight and obesity because of biological and behavioural characteristics of the condition, but little is known about weight status or related factors in this population. This study aimed to identify the rate of overweight and obesity in a cohort of children with ASD and their parents, and examined associated factors.

Methods: Parents of 223 Australian children aged 2-16 years with a clinical diagnosis of ASD completed questionnaires about socio-demographics, medical history, medicine use, sleep and social responsiveness. The Autism Diagnostic Observation Schedule was also administered. Weight and height for children and parents were collected. Using international standards body mass index (BMI) was generated.

Results: The rate of overweight and obesity in children with ASD was 33.2%. The majority of parents were overweight or obese (mothers 57.9%; fathers 74.5%). There were significant but weak associations between child BMI and maternal ($r = .272$, $n=202$, $p = .000$), and paternal ($r = .194$, $n=109$, $p = .043$) BMI. Age, gender, parental education, family income, ethnicity and ASD severity were unrelated to children's BMI status.

Conclusion: The rate of overweight and obesity among children with ASD and their parents is significantly high. These findings warrant further research to better understand factors that influence weight status among children and parents. There is scope for interventions that address specific needs with ASD and shape healthy behaviours in a bid to prevent or improve weight status.

Joanna Granich - joanna.granich@telethonkids.org.au

Presenting Author: GRANT, Nicole

Title: Early analysis of a randomized controlled trial of a web-based Autism Decision Aid for parents of children newly diagnosed with ASD

Affiliation: School of Health and Rehabilitation Sciences,
The University of Queensland

Co-authors: Sylvia Rodger, Tammy Hoffmann

Background: It is well known that parents often turn to the Internet for information regarding autism interventions.

As part of a PhD project, a web-based Autism Decision Aid was purpose-designed for Australian parents of children newly diagnosed with an Autism Spectrum Disorder.

Parents from all Australian states and territories were invited to participate in a Randomised Controlled Trial, to determine the decision aid's impact on parental self-efficacy and confidence with decision-making.

Methods: This study was an RCT involving parents (N=75) from all over Australia. The intervention group were provided with access to the password protected web-based decision aid (www.autismdecisionaid.com.au), and asked to access the site at their leisure over a minimum of a 3-month period. The control group were not given access to the website and accessed information in whatever manner they wished to. Pre- and post-test outcome measures were administered via interview, and included the Parental Sense of Competency Scale (PSOC), Decisional Conflict Scale (DCS), and a Likert scale asking parents to rate their confidence levels regarding intervention decision making at the time of interview.

Results: The RCT is scheduled for completion in early September 2014.

This presentation will reveal the results and early analysis of the RCT data.

Conclusion: Parents of children newly diagnosed with autism frequently turn to the Internet for information on autism interventions. The information obtained is often inappropriate, misleading or irrelevant, and can further add to the confusion and sense of overwhelm described by parents when asked to recount their experiences post-diagnosis.

A website relevant to the Australian context, that describes evidence supporting the various interventions available, and delivers this information in a format appealing to parents, is much needed.

Nicole Grant - nicole.grant@uqconnect.edu.au

Presenting Author: GREEN, Jessica

Title: Autism Spectrum Disorder symptoms in children with Attention Deficit/Hyperactivity Disorder: A community-based study.

Affiliation: Murdoch Childrens Research Institute, Flemington Road,
Parkville, Victoria, Australia 3052

Co-authors: Emma Sciberras, Vicki Anderson, Daryl Efron, Brad Jongeling,
Jan Nicholson and Nicole Rinehart.

*** Please note that this presentation is part of a symposium on co-morbidity of ASD-ADHD and if accepted will be presented with abstracts submitted by Nicole Papadopoulos and Simone*

Objectives: This study examined: (1) the prevalence of autism spectrum disorder (ASD) symptoms in children with Attention-Deficit/Hyperactivity Disorder (ADHD) compared with non-ADHD controls; and (2) the association between ASD symptoms and (a) peer problems; (b) mental health; and (c) quality of life, in children with ADHD.

Methods: Participants were 6-10 year old children (164 ADHD; 198 non-ADHD controls) recruited across 43 schools in Melbourne. ADHD was assessed using the parent- and teacher-reported Conners' 3 ADHD index and the Diagnostic Interview Schedule for Children-IV (DISC-IV). ASD symptoms were identified using the Social Communication Questionnaire (SCQ). Outcomes included peer problems (Strengths and Difficulties Questionnaire), mental health (DISC-IV), and quality of life (Pediatric Quality of Life Inventory 4.0).

Results: Children with ADHD had higher SCQ total scores, compared to controls (adjusted mean difference = 4.0, 95% confidence interval 2.8:5.3, $p < 0.001$, effect size = 0.7). About 1 in 4 (23%) children with ADHD had an SCQ total score in the clinical range. Boys with ADHD had greater ASD symptom severity than girls with ADHD. Higher SCQ scores were associated with increased parent and teacher-reported peer problems (both $p < 0.0001$) for children with ADHD. Higher SCQ scores were also associated with internalising ($p = 0.001$) and externalising disorders ($p = 0.02$), and reduced quality of life ($p < 0.0001$) in children with ADHD.

Conclusions: ASD symptoms are common in children with ADHD and are associated with poorer functioning across multiple domains. It is important for clinicians to routinely assess and manage ASD symptoms in children with ADHD.

Jessica L. Green - jessica.l.green@monash.edu.

Presenting Author: HANCOCK, Ashlee

Title: Differences in Diagnostic Decisions of Autism Spectrum Disorder across Professionals within Community Settings

Affiliation: School of Psychological Science, La Trobe University

Co-authors: Kristelle Hudry, Josephine Barbaro

Despite the development of best practice guidelines for Autism Spectrum Disorder (ASD) assessment and the availability of standardized ASD measures, parents may receive conflicting diagnostic information regarding their child. The extent to which the disorder is conceptualised, and criteria followed, by diagnosing clinicians may vary widely across professions. The present study therefore investigates how often children's final community diagnoses differ from the initial assessment opinion provided by an ASD specialist, in children aged between 12 and 36 months. Subsequent to this, factors pertaining to both the child and the diagnosing professional are explored to determine which, if any, are associated with children receiving conflicting diagnoses. This study involves children previously assessed for an ASD at the Early Assessment Clinic (EAC) between the years of July 2011 and June 2014, the EAC clinicians, and each child's community diagnosing professional. Information was retrieved from each child's EAC assessment report pertaining to the diagnostic opinion given by the EAC clinicians, scores on the ADOS, ADI-R, and Mullen, the child's demographics, as well as any co-morbid conditions identified. A general and demographic survey, and the Autism Spectrum Disorder Survey for Diagnosing Practitioners was administered to all EAC clinicians and community diagnosing professionals in order to examine their views, beliefs, and knowledge regarding early ASD.

Highlighting commonalities and exploring differences in diagnostic procedures across the different professions may clarify specific areas for intervention at the professional level. By better understanding this we hope to help make the early identification and diagnosis of ASD more achievable.

Ashlee Hancock - aj2hancock@students.latrobe.edu.au

Presenting Author: HOLLIER, Lauren

Title: Perinatal Testosterone Exposure and Cerebral Lateralisation in Adult Males: Evidence for the Callosal Hypothesis

Affiliation: Telethon Kids Institute & School of Psychology, University of WA

Co-authors: Murray Maybery, Jeffrey Keelan, Martha Hickey, and Andrew Whitehouse

Background: It has long been speculated that developmental language difficulties may reflect failure to develop typical lateralisation. Two competing theories address the influence of fetal testosterone on cerebral laterality: one proposing exposure to high fetal testosterone concentrations is related to atypical lateralisation (Geschwind-Galaburda hypothesis), the other that high fetal testosterone concentrations exaggerate typical lateralisation (callosal hypothesis). The current study examined the relationship between cord testosterone concentrations and cerebral laterality for language and spatial memory in adulthood.

Methods: Male participants from the Western Australian Pregnancy Cohort Study with high (>0.15 nmol) and low (<0.10 nmol) levels of perinatal testosterone were selected and invited to take part in the study (n = 18 in each group). Cerebral laterality was measured using functional Transcranial Doppler Ultrasonography (fTCD), which uses ultrasound to measure blood flow in the left and right middle cerebral arteries. Recordings were taken while participants completed word generation and visual short-term memory tasks.

Results: A Laterality Index (LI) was calculated by computing the relative difference in blood flow velocity between the two hemispheres. Examining the data in terms of left (a positive LI) and right (negative LI) lateralisation revealed that right hemisphere language lateralisation was more likely in the low testosterone group (11%) than the high testosterone group (0%), $\chi^2 = 4.50$, $df = 1$, $p = .034$. Spatial memory laterality was unrelated to cord testosterone level.

Conclusions: The current study is the most direct test to date of the relationship between fetal testosterone exposure and cerebral laterality in adults. Our findings indicate that fetal testosterone exposure is related to the development of language laterality in a direction that supports the callosal hypothesis.

Lauren Hollier - lauren.hollier@graduate.uwa.edu.au

Presenting Author: HOLMES, Clare
Title: The presentation of Autism Spectrum Disorder in Adulthood
Affiliation: Flinders University, S.A.
Co-authors Robyn Young

It is understood that the presentation of autism spectrum disorder (ASD) differs across the lifespan (Seltzer et al., 2003), however, relatively little is known about symptomatology in adulthood. Using an online questionnaire, we sought to address the presentation of symptomology in adulthood and the impact that ASD continues to have on one's functioning. 87 adults with ASD, 23 of their significant others (parents/caregivers and spouses), and 19 psychologists and psychiatrists responded. It was shown that all DSM-5 diagnostic criteria (American Psychiatric Association, 2013) continued to affect adults frequently with the exception of Criterion B1: repetitive and stereotypical behaviours. Interestingly, difficulties with social-emotional reciprocity were considered by clinicians to be more significant than by persons with ASD or their significant others, whereas clinicians tended to minimise the impact of sensory issues. Respondents with ASD indicated that symptom management was easier as an adult, most frequently due to greater control over their environment and social interactions. However, the increased responsibilities of adult life tended to exacerbate some symptoms. It is thus apparent that repetitive and stereotypical behaviours, which are a core-feature of the disorder in childhood, may not be as salient in adulthood, while sensory difficulties continue to impact functioning.

Clare Holmes - clare.holmes@flinders.edu.au

Presenting Author: HOWLIN, Patricia
Title: Outcomes in adulthood for individuals with autism- an analysis of findings from recent research
Affiliation: Institute of Psychiatry, King's College, London;
Brain Mind Research Institute, University of Sydney.
Co-authors:

Background: Despite over seven decades of research in autism, studies with a focus on adulthood remain limited (Magiati, et al., 2014*). There is little systematic research on trajectories of development from child to adulthood or on factors that may influence long-term prognosis.

Method: 60 individuals diagnosed with autism as children (mean age 6 years), all of whom had a non-verbal childhood IQ ≥ 70 , were reassessed in mid- adulthood (mean age 39 years) on a range of cognitive, social and mental health measures. Factors related to adult functioning were explored and the findings compared with data from other adult samples.

Results: In the present cohort, IQ remained generally stable and severity of autism symptoms improved but social integration in adulthood (employment, friendships, close relationships etc.) was limited. No individuals were reported to have lost their autism symptoms completely, as found in some studies; however, mental health problems were less than reported in previous research. Although the general trend was for improvement over time a minority of individuals showed an apparent decline in cognitive ability, often related to severe behavioural disturbance.

Conclusions: Findings from this and other studies of adult outcome are variable. The presentation will examine reasons for this variability and will also review the evidence for claims of "recovery" in autism and the potential influence of early intervention on later adult life.

*Magiati, Tay & Howlin (2014) Cognitive, language, social and behavioural outcomes in adults with autism spectrum disorders: a systematic review *Clin Psychol Rev.*, 34, 73-86

Patricia Howlin - patricia.howlin@kcl.ac.uk

Presenting Author: HUDRY, Kristelle

Title: Response to dynamic eye gaze: A neural marker for autism in 6-month olds?

Affiliation: Olga Tennison Autism Research Centre,
School of Psychological Science, La Trobe University

Co-authors Mayada Elsabbagh, Evelyn Mercure, Susie Chandler,
Greg Pasco, Tony Charman, Andrew Pickles,
Simon Baron-Cohen, Patrick Bolton, Mark H Johnson,
& the BASIS Team

Autism spectrum disorders (ASD) present in around 1% of the general population. They are known, however, to be highly heritable, and recurrence rates in the younger siblings of children with established diagnoses are around 20%. No reliable predictors of ASD yet exist in early infancy, though behavioural features of the syndrome do present by the first birthday, becoming increasingly apparent across the second year of life. While diagnosis can be made reliably from around 2 years of age, most community clinical diagnoses are not usually given until children are 3 or 4 years, or even older still. While ASD has traditionally been characterised and diagnosed on the basis of behavioural presentation, indicators of brain functioning may present as sensitive predictors of later behavioural atypicality. Given that atypical eye contact is characteristic of the syndrome of ASD, this study examined whether neural sensitivity to eye gaze during infancy might be associated with later ASD. Within a prospective longitudinal study of infants with and without familial ASD risk-status, event-related potentials (ERPs) were recorded in infants aged between 6 and 10 months, in response to viewing faces with dynamic eye-gaze movements. The infants were then followed up at 36 months of age, when comprehensive ASD diagnostic assessments were conducted. Longitudinal analyses showed that characteristics of ERP components in infancy were associated with ASD diagnosis in childhood, suggesting that ERP responses to dynamic eye gaze stimuli may help to characterize early developmental processes leading to later autism.

Kristelle Hudry - k.hudry@latrobe.edu.au

Presenting Author: JAMNADASS, Esha

Title: The perinatal androgen:estrogen ratio and autistic-like traits in the general population: a longitudinal pregnancy cohort study

Affiliation: The University of W.A. and the Telethon Kids Institute

Co-authors Jeffrey Keelan, Lauren Hollier, Martha Hickey,
Murray Maybery, Andrew Whitehouse

Background: Prenatal exposure to androgens has been hypothesized to be linked to Autism Spectrum Disorder (ASD). Whilst previous studies have found a link between testosterone in amniotic fluid and autistic-like traits, a similar relationship has not been found for testosterone in umbilical cord blood. One explanation for this may be that it is the relation between androgens (A) and estrogens (E) that influences the development of autistic-like traits. The current study investigated the A:E ratio in relation to autistic-like traits in young adulthood.

Methods: Sex steroids were measured in perinatal cord blood and autistic-like traits were measured by the Autism Spectrum Quotient (AQ) at age 19 or 20. Cord blood was assayed for androgens (testosterone, androstenedione, and dehydroepiandrosterone) and estrogens (estrone, estradiol, estriol and estetrol) using liquid chromatography mass spectrometry. The data were collected from the Western Australian Pregnancy Cohort with sex steroid and AQ data available from 372 participants. Five individuals reported an ASD diagnosis.

Results: Whilst males exhibited higher androgen and A:E ratios than females, no significant relationship was found between the ratio and autistic-like traits in early adulthood. Individuals with a diagnosis of ASD did not exhibit particularly elevated hormone concentrations[\[a1\]](#).

Conclusions: Whilst the A:E ratio in cord blood does not appear to predict autistic-like traits in the population as measured by the AQ, it does not rule out its ability to predict other neurodevelopmental traits in early development. In addition, it does not invalidate the relationships found between sex-steroids in amniotic fluid and early social development.

Esha Jamnadass - esha.jamnadass@research.uwa.edu.au

Presenting Author: JOHNSON, Katherine

Title: Disrupted functional connectivity in dorsal and ventral attention networks during attention orienting in autism spectrum disorders

Affiliation: School of Psychological Sciences, University of Melbourne

Co-authors Jacqueline Fitzgerald, Elizabeth Kehoe, Arun Bodke, Hugh Garavan, Louise Gallagher, Jane McGrath

Background: Attention orienting is a cognitive process that facilitates the movement of attention focus from one location to another: this may be impaired in autism spectrum disorder (ASD). This study investigated the functional connectivity of attention orienting in ASD using the Posner Cueing Task.

Method: Twenty-one adolescents with ASD and 21 matched controls underwent functional magnetic resonance imaging. A psychophysical interaction (PPI) analysis was implemented to investigate task-dependent functional connectivity, measuring synchronicity of brain regions during the task. Regions of interest (ROI) were selected to explore functional connectivity in the ventral attention network (VAN) during invalid and valid trials and in the dorsal attention network (DAN) during cue-only conditions.

Results: Behaviourally, the ASD and control groups performed the task in a similar manner. Functional MRI results indicated that the ASD and control groups activated similar brain regions. During invalid trials (VAN), the ASD group showed significant positive functional connectivity to multiple brain regions, whilst the control group demonstrated negative connectivity. During valid trials (VAN), the two groups also showed contrasting patterns of connectivity. In the cue-only conditions (DAN), the ASD group showed weaker functional connectivity.

Conclusion: The DAN analysis suggests that the ASD group has weaker coherence between brain areas involved in goal-driven, endogenous attention control. The strong positive functional connectivity exhibited by the ASD group in the VAN during the invalid trials suggests that individuals with ASD may generate compensatory mechanisms to achieve neurotypical behaviour. These results support the theory of abnormal cortical connectivity in autism.

Katherine Johnson - kajo@unimelb.edu.au

Presenting Author: KIRKOVSKI, Melissa

Title: Sex differences in structural and functional connectivity in ASD

Affiliation: Monash Alfred Psychiatry Research Centre, Monash University and The Alfred

Co-authors Peter G. Enticott, Jerome J. Maller, Matthew E. Hughes, Susan L. Rossell, Paul B. Fitzgerald.

Structural neuroimaging research suggests that females with ASD may experience more severe or widespread brain based abnormality than affected males. We investigated structural and functional neurobiological sex difference in a sample of high-functioning adults with ASD. Participants underwent a diffusion weighted protocol, and two functional MRI paradigms: a) at rest and b) while interpreting interactions between two geometric shapes. Structurally, there were no differences in white matter between groups, or when data were stratified by sex. Resting fMRI analysis revealed no differences in connectivity within the default mode network. The ASD group however had greater functional connectivity between broader resting state regions (cingulate cortex, and posterior superior temporal gyrus), and the primary somatosensory cortex bilaterally. This effect appeared to be driven by the male sub-sample. Task related fMRI analysis revealed no difference in activation while processing social interactions between groups. Sex stratified analysis revealed increased activity for control males in the right temporo-parietal junction, and ASD males in the right posterior superior temporal sulcus (pSTS). A positive diagnosis X sex interaction was also noted for activity in the pSTS. The ASD group had increased connectivity between the pSTS and bilateral ventral posterior cingulate cortex. These findings provide evidence to support that males and females with ASD do experience an altered neurobiological profile, not accounted for by expected sexual dimorphisms. Males with ASD appear to experience functional brain based abnormality compared to their neurotypical counterparts while affected females shown patterns of brain activity akin to neurotypical females.

Melissa Kirkovski - melissa.kirkovski@monash.edu

Presenting Author: LANDRY, Oriane
Title: A meta-analysis of Wisconsin Card Sort Task performance in autism.
Affiliation: La Trobe University
Co-authors Shems Al-Taie, McMaster University

We conducted a meta-analysis of Wisconsin Card Sort Task performance in participants with autism. We were able to retrieve 31 studies reporting on a total of 793 participants with autism, published over a 30-year span. We calculated Cohen's *d* effect sizes for four measures of performance: sets completed, perseveration, failure-to-maintain-set, and non-perseverative errors. The mean effect size for each measure was as follows: 0.82 for number of sets completed, 0.75 for perseveration, 0.45 for failure-to-maintain-set, and 0.61 for non-perseverative errors. Four one-sample t-tests confirmed that these effect sizes were all significantly above 0. Across studies, there was wide variability in effect sizes, however, this could not be accounted for by variability in methodological (such as computer versus manual administration) or sample characteristics (such as age or IQ of participants) as reported in the original studies. Year of publication was also not associated with effect size, suggesting changes to diagnostic criteria over this timeframe is not related to group-wise performance on this task. We conclude that failure-to-maintain-set and non-perseverative errors represent aspects of impaired task performance in autism often overlooked due to small sample sizes and that the impairment is less pronounced than perseveration.

Oriane Landry - oriane.landry@gmail.com

Presenting Author: LANE, Alison
Title: Temperament and sensory features in infants at risk of autism: A retrospective video analysis study
Affiliation: The University of Newcastle
Co-authors Leah Rowlandson, Linda E Campbell, Robyn Young

Background: Previous studies have found that, in general, temperament traits and sensory features in autism differ from that of typically developing children. While several studies have recognised the connections between these in infant development, few studies have empirically tested these associations in infants with risk factors for autism. This study aimed to: 1) compare temperament and sensory features in 6-month infants with and without risk for autism, and 2) explore the predictive relationship of temperament and sensory features at 6-months with heightened risk for ASD at 12 months.

Methods: A secondary analysis of pre-existing video data was conducted. The temperament of 36 x 6-month infants was rated using the Temperament Adjective Triad Assessment (TATA). Responses to touch, sound and mouthing behaviours were also coded from the same video footage. Raters were blinded to the risk status of the infants. At 12-months, infants were assessed using Autism Detection in Early Childhood (ADEC) to establish risk for autism (high risk n=11; low risk n=25).

Results: Six dimensions of temperament and one sensory feature differed significantly between risk groups. Moderate to strong associations were observed between mouthing duration, mood, vocalization, touch response and startle to unexpected sounds. Aspects of temperament related to alertness and approach combined with mouthing duration and likelihood to respond calmly to an unexpected sound at 6-months were strongly predictive of risk for autism at 12 months ($R^2=0.46$, $F=3.03$, $p=0.05$; $n=19$).

Conclusion: Temperament and sensory features are related in infants at risk of autism.

Alison E Lane - Alison.lane@newcastle.edu.au

Presenting Author: LANE, Alison
Title: Sensory subtypes in toddlers with risk factors for Autism Spectrum Disorder (ASD).
Affiliation: The University of Newcastle
Co-authors Kelsey Philpott-Robinson, Karen Harpster

Background: Distinct sensory subtypes have been identified in children aged 3-10 years with a diagnosis of ASD. Previous studies have reported that sensory features are evident in early childhood prior to diagnosis. This study aimed to 1) identify sensory

subtypes in young children aged 12-24 months with risk factors for ASD; and 2) explore the association between sensory features, developmental profile and presence of early signs of autism.

Methods: Forty-six toddlers aged 12-24 months with and without risk for autism participated in the study. Sensory features were measured using the Infant Toddler Sensory Profile; general development was assessed using the Bayley Scales of Infant Development-Third Edition and early signs of autism were established using the Autism Detection in Early Childhood (ADEC).

Results: Model-based cluster analysis revealed two distinct sensory subtypes - Sensory Reactive (n=19) and Sensory Adaptive (n=27). Members of the Sensory Reactive subtype showed elevated reactivity scores in auditory and vestibular domains ($p=0.01$; $p=0.01$). Moderate-level, significant correlations were observed between all sensory domains and receptive and expressive language scores indicating that higher language abilities were associated with fewer sensory features. A moderate, negative correlation was also observed between oral sensory processing and ADEC score (-0.32 , $p=0.03$) suggesting that better oral sensory skills were associated with lower risk for autism.

Conclusion: Distinct sensory subtypes were identifiable in toddlers with and without risk for autism. Overall, toddlers showing more sensory features had lower language development scores and higher risk for autism. Replication of this preliminary work is required.

Alison E Lane - alison.lane@newcastle.edu.au

Presenting Author: LANE, Alison

Title: Robust features for the automatic identification of autism spectrum disorder in children

Affiliation: The University of Newcastle

Co-authors Justin Eldridge, Simon Dennis, Mikhail Belkin

Background: It is commonly reported that children with autism spectrum disorder (ASD) exhibit hyper- or hypo-reactivity to sensory stimuli. Electroencephalography (EEG) is commonly used to study neural sensory reactivity, suggesting that statistical analysis of EEG recordings is a potential means of automatic classification of the disorder. EEG recordings taken from children, however, are frequently contaminated with large amounts of noise, making analysis difficult. In this paper, we present a method for the automatic extraction of noise-robust EEG features, which serve to quantify neural sensory reactivity. We show the efficacy of a system for the classification of ASD using these features.

Methods: An oddball paradigm was used to elicit event-related potentials from a group of 19 ASD children and 30 typically developing children. EEG recordings were taken and robust features were extracted. A support vector machine, logistic regression and a naïve Bayes classifier were used to classify the children as having ASD or being typically developing.

Results: A classification accuracy of 79% was achieved, making our method competitive with other automatic diagnosis methods based on EEG. Additionally, we found that classification performance is reduced if eye blink artifacts are removed during preprocessing.

Conclusions: This study shows that robust EEG features that quantify neural sensory reactivity are useful for the classification of ASD. We showed that noise-robust features are crucial for our analysis, and observe that traditional preprocessing methods may lead to poor classification performance in the face of a large amount of noise. Further exploration of alternative preprocessing methods is warranted.

*NB. This paper will present results reported in the following published article: Eldridge, J, Lane, AE, Belkin, M & Dennis, S (2014). Robust features for the automatic identification of autism spectrum disorder in children. *Journal of Neurodevelopmental Disorders*, 6:12.

Alison E Lane - alison.lane@newcastle.edu.au

Presenting Author: LILLEY, Rozanna

Title: Experiences of School Choice and Change for Mothers of Students Diagnosed with Autism

Affiliation: Children and Families Research Centre, Institute for Early Childhood, Macquarie University

Co-authors

In this presentation I summarise the findings of a recently submitted PhD investigating the experiences of 22 mothers whose children diagnosed with autism were transitioning to school in Sydney. Qualitative interviews were conducted over three years

(2009-2011) focusing on maternal experiences of school choice and change in the early years of formal education. Thematic narrative analysis of the interview transcripts (62 in total) highlighted themes of stigmatisation, exclusion and knowledge negotiation in the lives of these families. Overall the six publications that comprise the core of this dissertation point to the constraints and dilemmas surrounding primary school placement and an ongoing drift towards segregated classrooms, especially for students diagnosed with both autism and an intellectual disability. The systemic failures to meet the promise of policies of school inclusion are demonstrated at the level of everyday practices by school gatekeepers, educators and bureaucrats. Maternal engagement with various forms of knowledge, both expert (professional guidance) and lay (rumour), is highlighted. Operating within this disabling context has, I suggest, negative consequences for both mothers and their children. Listening to these mothers contributes to the social fund of knowledge about current education practices in NSW impacting on children experiencing disability and their families. That knowledge, in turn, is part of the work needed to help us all to imagine different, and more inclusive, futures.

Dr Rozanna Lilley - roselilley@fastmail.fm

Presenting Author: MAGIATI, Iliana

Title: **Autistic traits in an unselected sample of Singaporean pre-school children using the Q-CHAT: individual differences and psychometric properties of the Quantitative-Checklist for Autism in Toddlers (Q-CHAT)**

Affiliation: Department of Psychology, National University of Singapore

Co-authors Deborah Amanda GOH, Joyce LIM, Jerlyn LEONG, Daniel GAN, Anne RIFKIN-GRABOI, Birit LEUTSCHER-BROEKMAN, Michael MEANEY, Carrie ALLISON, Simon BARON-COHEN, & the GUSTO Study Group

Background: The dimensional conceptualization of Autism Spectrum Conditions as the extreme end of normally distributed autistic-like traits (ALTs) has led to increased efforts to dimensionally measure and better understand ALTs, their presentation and associated characteristics in the general population.

Methods: The present study investigated the distribution, stability and change of autistic traits in an unselected sample of Singaporean toddlers using the Quantitative-Checklist for Autism in Toddlers (Q-CHAT). Participants were recruited from a large prospective longitudinal study in Singapore, the GUSTO study (Growing Up in Singapore Towards healthy Outcomes). Children's autistic traits were reported by their caregivers when the children were 18 ($n=368$) and 24 months old.

Results: An exploratory factor analysis produced a three-factor solution accounting for 34.8% of the total variance in Q-CHAT scores: Social-Communicative autistic traits; non-social/behavioral autistic traits and speech/language development traits. Internal consistencies were suboptimal for the Q-CHAT Total and the Q-CHAT Speech/Language Development items, but acceptable for the Social-Communicative and Non-Social/Behavioural domains. Mean Social-Communicative autistic trait scores increased significantly from 18 to 24 months ($d = .16$), while Non-Social/Behavioural scores decreased significantly over the same time ($d = .45$). The relationship of autistic traits with internalizing problems and the Pervasive Developmental Problems scales from the Child Behavior Checklist were also examined.

Discussion: The present study's findings are discussed in relation to current literature on understanding autistic traits in the general population, with a focus on similarities and differences in autistic traits in different cultural contexts.

Dr Iliana Magiati - psyim@nus.edu.sg

Presenting Author: MAGIATI, Iliana

Title: **Which autism symptoms predict different anxiety symptoms in children with ASD? Findings from a cross-sectional and a one year follow-up study**

Affiliation: Department of Psychology, National University of Singapore

Co-authors TAN Ke Jia Germaine, ONG Clarissa, LIM Xin Yi, TAN Julianne Wen-Li, Amily Yi Lin ONG, Ferninda PATRYCIA, Daniel FUNG, Min SUNG, Kenneth K. POON, & Patricia HOWLIN

Background: Although a number of earlier studies have found a positive relationship between autism symptom severity and anxiety symptoms in individuals with ASD, much less is known about (i) whether specific autism symptom domains predict different anxiety subtypes and (ii) whether this relationship can be replicated in prospective longitudinal studies.

Methods: A non-referred sample of 241 caregivers of 6-18 year old Singaporean young people with a professional diagnosis of ASD attending specialist schools completed measures of their child's anxiety, adaptive functioning and emotional and behavioral difficulties, including autism symptoms. One year later, 54 of them completed the same measures.

Results: In the cross-sectional study, it was the severity of repetitive behavior/ speech symptoms which emerged as a single most significant and consistent predictor of all anxiety subscale symptom scores (separation anxiety, panic and agoraphobia, OCD and physical injury anxiety symptoms), except social phobia and physical injury fears. Children's adaptive functioning and chronological age predicted social phobia and generalized anxiety symptoms only. In the follow-up study, anxiety total and subscale scores remained generally stable, except for social anxiety symptoms which increased after one year. Those who had higher social communication skills at Time 1 tended to be more socially anxious at Time 2. Earlier anxiety predicted later anxiety symptoms, while earlier autism severity also had incremental validity in predicting later anxiety.

Discussion: Findings are discussed in relation to the study's limitations and the potential implications of these results in informing assessment and intervention for anxiety in this population.

Dr Iliana Magiati - psyim@nus.edu.sg

Presenting Author: MAGIATI, Iliana

Title: A prospective longitudinal investigation of early precursors of social and non-social autistic traits in a community sample of 18-month-old Singaporean toddlers

Affiliation: Department of Psychology, National University of Singapore

Co-authors Daniel GAN, Iliana MAGIATI, Deborah Amanda GOH, Alicia CHEW, Anne RIFKIN-GRABOI, Birit LEUTSCHER-BROEKMAN, Michael MEANEY & the GUSTO Study Group

Background: Recent research has demonstrated that while Autism Spectrum Disorders (ASDs) and Autistic-Like Traits (ALTs) likely share a common etiology, different domains/ clusters of autistic symptoms are likely underpinned by distinct sets of causative influences.

Aims: This study investigated whether early precursors of ASD occurring at birth and in the first year of life (pregnancy/birth complications, infant temperament at 3 months, and 12-month social development –imitation/play, gestures, and empathy) were significantly associated with and predicted later social and non-social ALTs in an unselected sample of 18-month-old toddlers.

Method: Participants were 368 Singaporean toddlers involved in a larger prospective longitudinal study (GUSTO -Growing Up in Singapore Towards healthy Outcomes). Information on pregnancy/birth complications was obtained from standardized inventories. Caregivers completed measures of temperament, social development and ALTs at 3, 12, and 18 months respectively. Hierarchical regression analyses were conducted to identify significant predictors of later social and non-social ALTs.

Results: Pregnancy/birth complications, imitation, and empathy were not associated with later ALTs. Different temperament dimensions were associated with and predicted later social and non-social ALTs. Gesture development was associated with and predicted later social ALTs only.

Discussion: The study findings resonate with earlier literature and provide preliminary cross-cultural evidence showing that the etiological contributions and neurodevelopmental abnormalities underpinning the different core autistic dimensions are possibly different. Limitations and future directions are also discussed.

Daniel Gan - danielgan86@gmail.com

Presenting Author: MERTINS, Stephanie

Title: Investigating Diet, Behavioural, Gastrointestinal and Sleep Problems in Children with and without Autism Spectrum Disorder.

Affiliation: Olga Tennison Autism Research Centre, La Trobe University

Co-authors Amanda Richdale

Background: Behavioural, gastrointestinal (GI) and sleep problems are common comorbid problems in children with Autism Spectrum Disorder (ASD), but are not generally examined within a single group of children, which would allow us to better understand if and how these factors might be related in ASD. This study investigated interactions between behavioural, GI and sleep problems in children with ASD and an age-matched group of typically developing (TD) children. Additionally, links between diet (diet diary) and comorbid problems were also explored to determine whether the consumption of food additives also child behaviour. This presentation will focus on the results from the questionnaire. **Method:** Parents of 84 Australian children (62 males, 22 females) aged 4 to 11 years (41 ASD, 39 TD) have completed the online study to date. Parents completed an online survey consisting of a screening questionnaire, demographic questionnaire, general diet questionnaire, the Social Communication Questionnaire (SCQ), and standard questionnaires on behaviour issues (RBRI), adaptive behaviour (SIB-R) sleep (SDSC) and a three day diet diary. **Results:** The study closes on October 31, 2014. A cross-sectional design has been used and questionnaire responses will be analysed using SPSS. It is expected that children with ASD will have higher reports of behavioural, GI and sleep problems than TD children and that these variables will be interrelated and associated with children's diet. **Conclusion:** Findings will be discussed in relation to current literature, in particular reports that diet impacts on the behaviour of children with ASD.

**Recruitment of the study will be completed by the end of October. It is anticipated that the results will be analysed and available by the ASfAR conference date.*

Stephanie Mertins - smertins@students.latrobe.edu.au

Presenting Author: NUSKE, Heather

Title: **Reduced pupil dilation indicates difficulties in learning from others emotions in young children with autism.**

Affiliation: Olga Tennison Autism Research Centre, La Trobe University

Co-authors Giacomo Vivanti, Cheryl Dissanayake

Often people with autism have atypical emotional reactions to others and have difficulties in learning from others. Although much research has focussed on these two bodies of literature in isolation, little research has focused on how people with autism with autism learn from others' emotions. In this study, we aimed to fill this research gap.

We showed 20 children with autism and 20 typically developing children videos showing a short (20 sec) scenario involving an actor who opens a box and reacts happily or fearfully to the object inside (occluded from the child's view). The box is shown up-close before and after this short scenario, thus before and after it is given emotional valence by the actor (*Pre-* and *Post-Box*, respectively). Pupil size was measured as an index of emotional reactivity as well as visual scanning patterns of the children, using eye-tracking technology.

Results showed that the two groups of children were no different in their visual attention to the happy and fearful expressions. However, whilst the typically developing children dilated their pupils more to the Post-Box than the Pre-Box, the children with autism did not, suggesting that they did not adjust their emotional responses in line with those of the actor. These findings indicate that people with autism have difficulty quickly learning from others emotions about the world around them.

Dr Heather Nuske - h.nuske@latrobe.edu.au

Presenting Author: O'BRIEN, Karen

Title: **Parents' perceptions of how of their child with ASD interacts with different family members**

Affiliation: The University of Queensland

Co-authors

Background: There has been little research to date into how children with autism spectrum disorders (ASD) engage in social behaviours with different family members, especially siblings. Children with ASD interact differently with their siblings and parents. They tend to spend more time with their siblings than with their parents or peers.

Methods: Participants were the primary caregivers of 139 male and 23 female children with autism who completed an online survey rating the level of engagement (1 every occasion to 5 never) of 39 social behaviours their child with autism interacted with younger siblings, older siblings and with their parents.

Results: A factor analysis of the 39 behaviours revealed 6 factors: positive interaction, positive communication, positive play, negative interaction, negative communication and negative play. A Wilcoxon signed rank test compared the parent ratings of the ASD child's engagement with different play partners and found significant differences in engagement levels between the three dyads of ASD child playing with parent, older TD sibling or younger TD sibling with the majority of results showing more positive behaviours and less negative behaviours when the ASD child plays with their parent.

Conclusion: These findings suggest there are some differences in how ASD children interact with different family members. Parents may be better able to adapt their behaviour to cater for the individual characteristics of the ASD child than the TD siblings although there is the risk of parent report bias. ASD children may learn more pro-social skills from their parents than their siblings.

Karen O'Brien - k.obrien@psy.uq.edu.au

Presenting Author: PALMER, Colin
Title: Perceptual inference in autism and the rubber-hand illusion
Affiliation: Monash University
Co-authors Bryan Paton, Melissa Kirkovski, Peter G. Enticott, Jakob Hohwy

Background: Autism spectrum disorders (ASD) are associated with differences in sensory processing in addition to more widely known socio-communicative and behavioural features. Here we examine multisensory perception and motor function in the context of a bodily illusion of ownership for a prosthetic limb (the Rubber-Hand Illusion; RHI).

Methods: Adults with ASD ($n=15$) and two nonclinical control groups (high and low in subclinical autistic traits; $n=15$ each) performed reach-to-grasp movements following induction of the RHI. We analysed integrated jerk (an index of movement smoothness) and various parameters of velocity subcomponents. The perceptual experience of the RHI was assessed via proprioceptive estimates, illusion onset latency and a self-report scale of illusory effects.

Results: Nonclinical adults low in autistic features showed disrupted movement execution following the illusion compared to a control condition. This manifested as increased integrated jerk and increased peak velocity of a mid-late subcomponent of movement. In contrast, individuals higher in autistic features (both those with ASD and nonclinical individuals high in autistic traits) showed reduced sensitivity to the presence of the illusion in their reaching movements. These differences occurred despite all groups exhibiting the typical perceptual effects of the illusion. Additionally, clinical individuals were distinct from those high in subclinical autistic traits in early features of movement.

Conclusion: These data point to differences in the influence of prior, contextual expectations regarding limb position on movement. Sensitivity to the sensory context may contribute to clinical and subclinical differences in motor performance. These results are consistent with recent inferential accounts of sensory processing in ASD.

Colin Palmer - Colin.Palmer@monash.edu

Presenting Author: PAPADOPOULOS, Nicole
Title: The effectiveness of a brief behavioural sleep intervention in school aged children with autism: A pilot randomized control trial.
Affiliation: Deakin Child Study Centre, Deakin University.
Co-authors Emma Sciberras, Harriet Hiscock, Melissa Mulraney, Jane McGillivray, Nicole Rinehart.

*** Please note that this presentation is part of a symposium on co-morbidity of ASD-ADHD and if accepted will be presented with abstracts submitted by Simone Thomas and Jessica Green.*

Background: Sleep problems are common in children with Autism Spectrum Disorders (ASD) and impact adversely on child behaviour and parent functioning. The study evaluated the effectiveness of a brief behavioural sleep intervention (Sleeping Sound) in children with comorbid ADHD and ASD.

Methods: Sixty-one children with comorbid ADHD-ASD (28 Intervention group; 33 Usual care) aged 5-13 years took part in the study. Participants were eligible if they met DSM-IV criteria for ADHD and ASD, had a moderate/severe sleep problem and met American Academy of Sleep Medicine criteria for a behavioural sleep disorder. The intervention involved sleep hygiene practices and standardised behavioural strategies delivered by trained clinicians over two consultations and a follow-up telephone call.

Results: Outcomes at 3 and 6 months post-randomisation included sleep problems, child behaviour and parent mental health. Children who received the intervention had large improvements in sleep problems (mean difference [95%CI]: 3 months -4.3 [-8.1, -0.6] $p=.02$, effect size = -0.7; 6 months -2.8 [-5.9, 0.4] $p=.08$, effect size = -0.5), and moderate improvements in child behavioural functioning three and six months post intervention.

Conclusions: These findings suggest that a brief behavioural sleep intervention can improve sleep in children with ASD-ADHD as well as child and parental mental health functioning.

Dr Nicole Papadopoulos - Nicole.Papadopoulos@deakin.edu.au

Presenting Author: PASULA, Ellisa-Yvette

Title: **Malaysia-Australia Autism Sleep Health Program: Collaborative Cross-cultural Research with Children with Autism Spectrum Disorder (ASD) and Typical Development**

Affiliation: Jeffrey Cheah School of Medicine and Health Sciences,
Monash University Malaysia
School of Psychological Sciences, Faculty of Biomedical and
Psychological Sciences, Monash University Australia

Co-authors: Clare Anderson, Fay Fletcher, Ellisa-Yvette Pasula, Kartini Ilias,
Marisa Loft, and Kim Cornish, Karen Golden

Healthy sleep is essential to learning and well-being. In children with Autism Spectrum Disorder (ASD), sleep disturbances further exacerbate the multiple challenges already faced by children, parents, teachers, and practitioners. The aim of the presentation is to advocate the importance of greater collaborative autism research in Australasia and to describe an innovative cross-cultural longitudinal research program entitled the Malaysia-Australia Autism Sleep Health Program. Parents of primary school-age children with ASD and matched parents of children with typical development completed a comprehensive questionnaire booklet in Australia and Malaysia. Parental sleep, daytime functioning, stress, mental health, and family functioning were assessed along with child sleep and mental health outcomes (e.g., anxiety, behavioural problems, autism symptomatology, executive functioning, communication, and attention). Wrist actigraphy was also utilized on a subsample. By affecting a child's ability to interact with the world around them, sleep difficulties further increase the long-term risk of behavioural and emotional problems. There is a need to develop culturally-specific evidence-based resources and intervention tools that identify profiles of strengths and weaknesses as early as possible in development. The collaborative program aims to identify culture-specific "signatures" of sleep difficulties and mental health outcomes in a population-based sample of Malaysian and Australian children. The parallel design provides a unique opportunity to explore cultural differences in the expression of symptoms and outcomes. Data allow for a comparison with age-matched Australian children to determine if profiles are similar or divergent. Some program findings will be discussed along with suggestions for future research in the Australasian region.

Karen Golden - karen.golden@monash.edu

Presenting Author: PAYNTER, Jessica M.

Title: **Knowledge and Use of Evidence-Based Practices in an Australian Early Intervention Service**

Affiliation: AEIOU Foundation, 66 Hamilton Road, Moorooka, Qld, 4111;
Mater Research Institute- UQ, South Brisbane, Qld, 4101

Co-authors: Deb Keen Griffith University

Background: Research has led to the identification of 27 evidence-based practices (EBP, Wong et al., 2013) for intervention with children with autism. A "research to practice gap" however, is frequently observed, with surveys of parents and professionals revealing use of unsupported treatments (e.g., sensory integration therapy, vitamin supplements, and elimination diets). There is limited published research on factors that facilitate or hinder the uptake of EBPs by community-based early intervention services for children with ASD. This study aimed to explore the relationships between knowledge and use of EBPs, organisational culture, attitudes toward EBPs, and demographic variables.

Methods: Ninety-nine staff at an ASD early intervention service completed surveys of knowledge and use of EBPs, as well as organisational culture, attitude, and demographics.

Results: Participants reported greater knowledge and use of EBPs than promising or unsupported practices. Knowledge and use of EBPs were linked to each other as well as organisational culture and attitude variables. Higher rates of EBP were found among professional than paraprofessional staff. Higher rates of EBP were also found in metropolitan vs. rural/regional centre staff.

Conclusion: This study adds to our knowledge and understanding about factors related to knowledge and use of EBPs in community settings. Results suggest a need for organisations to address staff knowledge and use of EBPs, particularly for paraprofessionals and for staff working in regional/remote areas.

Jessica M. Paynter - jessica.paynter@aeiou.org.au or jessica.paynter@me.com

Presenting Author: RICHDALE, Amanda¹

Title: Are Sleep Difficulties in ASD related to Delayed Development, GI symptoms, Medical Comorbidities or ASD Symptom Severity?

Affiliation: Olga Tennison Autism Research Centre, La Trobe University
Telethon Kids Institute, W.A.

Co-authors Emma Baker¹ & Andrew Whitehouse²

Background: Sleep difficulties are one of the most common comorbid conditions in ASD, occurring in up to 80% of children. Poor sleep in ASD has been associated with challenging behaviour, ADHD, anxiety, depression, GI symptoms, increased ASD symptoms, developmental regression and comorbid medical conditions. Nevertheless aetiology still remains speculative and is likely multi-factorial.

Method: The West Australian Autism Biological Registry (WAABR) collects detailed information on children with ASD in WA and is accessible to autism researchers. Demographics, pregnancy, birth information, developmental milestones, early ASD symptoms, GI symptoms, and medical conditions were extracted from the WAABR. Autism severity (SRS and ADOS) and communication (CCC-2), as well as sleep (CSHQ) measures were also available.

Results: 191 children aged 2-18 years (64 aged 2-5 years, 86 aged 6-11 years, 41 aged 12-18 years) with a clinical diagnosis of ASD were available for analysis. All children had an ADOS and / or SRS score in the clinical range. Our preliminary analyses suggest no relationship between poor sleep (CSHQ total score) and GI symptoms or intellectual disability. Medical conditions, early ASD signs, CCC-2 social interaction deviance composite and the SRS, appear to be related to poor sleep, but this is largely age-dependent.

Conclusions: Finding no relationship between GI symptoms and poor sleep was unexpected, as a relationship has been reported previously. In children <12 years preliminary results suggest that ASD symptom severity is most strongly associated with sleep difficulties. Data analysis will be completed and final results and their implications will be discussed.

Associate Professor Amanda Richdale – a.richdale@latrobe.edu.au

Presenting Author: RINEHART, Nicole

Title: Active Kids: Improving our understanding of health, sleep, physical activity and motor development in young children with Autism.

Affiliation: Deakin University & Irabina Childhood Autism Service

Co-authors Tamara May, Lisa Barnett, Trina Hinkley, Nicole Papadopoulos, Helen Skouteris, Jo Salmon, Anna Timperio, Jane McGillivray

Background: Autism Spectrum Disorder (ASD) has far reaching impacts on the developing child. For example, many children with ASD will have motor impairments that may play a role in reducing physical activity and engagement. Focusing on understanding the physical activity and health profile of children with ASD in relation to the broader clinical and core symptoms will provide a more comprehensive road map to early intervention. The aim of this study is to profile health, sleep, physical activity and motor abilities in pre-school aged children who have a diagnosis of ASD.

Method: Thirty children with ASD aged 4-6 years are currently being recruited from Irabina Childhood Autism Services. Children are completing cognitive (WPPSI-IV), health (height, weight, sleep questionnaire), motor (Movement Assessment Battery for Children, Test of Gross Motor Development) and physical activity (ActiGraph accelerometry) assessments. Physical activity levels are being collected for 7 days via children wearing accelerometers.

Results: Results discussed will include the relationship between BMI, motor skills and physical activity. Findings will determine if poorer motor skills are related to reduced levels of physical activity and/or increased BMI. The relationship between sleep and

physical activity will also be elucidated to determine whether increased levels of physical activity are associated with improved sleep functioning.

Conclusion: Results will highlight the associations between physical activity and motor skills in common problems in autism. Findings will have important implications for the development of physical activity interventions in young children with Autism Spectrum Disorders

Dr Tamara May - Tamara.may@deakin.edu.au

Presenting Author: RODGER, Sylvia¹ and VAN DOOREN, Kate^{1,2}

Title: Engaging Individuals with ASD and their Families using Inclusive Research Practices

Affiliation: Cooperative Research Centre for Living with Autism Spectrum Disorders (Autism CRC), Long Pocket Campus, The University of Queensland, Brisbane, Queensland¹ and School of Medicine, Faculty of Medical and Biological Sciences, The University of Queensland²

Co-authors

Calls for inclusive research and service delivery have been prominent in recent times with catch phrases such as “nothing about us without us”. Pellicano et al. (2013) have highlighted the need to engage with individuals on the spectrum in the research arena, and have called for a move beyond tokenism towards co-production. However, very little is understood about how to engage with individuals with ASD and /or their families in research endeavours. To this end, researchers at the Autism CRC have worked with adults with ASD in developing a Statement on Inclusive Research Practice. Further a series of Inclusive Research Practice Guides have been developed with input from adults with ASD to assist researchers to more effectively and meaningfully engage with individuals with ASD as research participants, advisory group members, co-presenters and co-producers of research, as well as recipients of research findings.

In this presentation, we will describe the benefits of inclusive research and outline key inclusive research practices, developed from the literature, our research and the experience of individuals with ASD and advocacy group members. Suggestions regarding ‘how to’ operationalise these practices will be provided as well as detailed overviews of the guides themselves. These have been endorsed by adults with ASD who have worked collaboratively with us to provide advice from their lived experience about research in general and the guides specifically. We will share feedback that researchers may be able to use in their own practice particularly in relation to language, communication, expectations, flexibility, and preparation etc.

Professor Sylvia Rodger - srodger@autismcrc.com.au

Dr Kate van Dooren - k.vandooren@sph.uq.edu.au

Presenting Author: SEGER, Gracia

Title: Investigating gut dysfunction in ASD: Expression of Neuroligin-3 in mouse small intestine.

Affiliation: Department of Physiology
The University of Melbourne, Parkville, Australia

Co-authors Joel C Bornstein, Elisa Hill-Yardin

Objective: Gastrointestinal (GI) dysfunction is common in patients with Autism spectrum disorder (ASD) however the underlying cause is unknown. A point mutation (*R451C*) in the (*Nlgn3*) gene encoding neuroligin-3, a synaptic adhesion protein was identified in ASD patients presenting with GI dysfunction. This project aimed to characterize Neuroligin-3 expression in the enteric nervous system (ENS) in the mouse small intestine to investigate whether altered Nlgn3 function could contribute to GI issues in ASD.

Method: Immunofluorescent labelling for *Neuroligin-3* and the neuronal marker nitric oxide synthase (nNOS) was undertaken in whole mounts of adult mouse jejunal myenteric plexus. Imaris imaging software (v 7.7) was used to generate 3-dimensional rendered images of myenteric ganglia in the mouse jejunum.

Results: We observed Neuroligin-3 labeling in axonal varicosities in the myenteric plexus of the mouse jejunum, however very few Neuroligin-3 immunoreactive (IR) cell bodies were present (6 neurons from 15 ganglia, 3 mice). 3-D reconstruction of ganglia showed Neuroligin-3-IR varicosities in close proximity to nNOS-IR cell bodies. The density of varicosities expressing neuroligin-3 in ganglia was $0.024 \pm 0.004 / \mu\text{m}^3$ ($n = 40$ ganglia from 4 mice). Some Neuroligin-3-IR varicosities appeared to contact nNOS-IR cell bodies (mean per cell body = 29 ± 2 ; 102 neurons).

Conclusion: Neuroligin-3 is present in varicosities in close proximity to myenteric neuronal cell bodies. These findings suggest that Neuroligin-3 plays a functional role in the ENS. Therefore, mutations in *Nlgn-3* probably alter GI function.

Elisa Hill-Yardin - elhill@unimelb.edu.au

Presenting Author: STIRLING, Lesley

Title: Interactional Aspects of Pretend Play with Children with ASD

Affiliation: University of Melbourne

Co-authors Susan Douglas, Cheryl Dissanayake, Stephen Conte

Background and aims: Research on the degree to which children with ASD can engage in collaborative pretend play is scarce. We focus on interactional aspects of social pretend play between adult/child pairs from ASD and typically developing (TD) groups, considering the verbal and non-verbal strategies the children and adults use to engage their play partner in the pretence.

Methods: Videos of 19 high-functioning children with ASD and 17 TD children matched on Verbal Mental Age were collected for a previous project (Prescott, 2003). We adopt a detailed discourse analytic approach to re-examine the 10-minute free play sessions from this study. We here present the results from an initial study of 10 ASD and 10 TD children; analysis of the remaining data is on-going. Sessions were coded for attempts to engage the play partner verbally or non-verbally – “solicitations” – and for whether these were successfully taken up by the partner to progress the play.

Results: Results from our pilot study show that adults in the ASD vs. TD dyads produced 50% more “solicitations” and these were less likely to be taken up by the children. Attempts to engage ASD children were more successful when they involved non-verbal rather than purely verbal communication.

Conclusions: Prescott (2003) found only minimal differences in pretend play between the groups. However a discourse analytic approach allows us to identify differences in interactional aspects of the play reflecting differences in engagement, and these have implications for interventions targeting social play.

Associate Professor Lesley Stirling - lesleyfs@unimelb.edu.au

Presenting Author: STOKES, Mark

Title: Effects of Alcohol use and the broader autism phenotype

Affiliation: Deakin University, School of Psychology

Co-authors Ms Louise Dove, Dr Mark Stokes

Background: Relatives of individuals with autism who themselves exhibit some features of, but do not meet full criteria for an autism diagnosis, fit the Broader Autism Phenotype (BAP). The purpose of this study was to examine whether those on the BAP experienced increased ASD symptoms with problematic alcohol use through alcohol’s impact upon aspects of executive function. This would have intervention implications for individuals within the BAP and those with an ASD. We hypothesised that individuals within the BAP and typically developing (TD) individuals would have different patterns of relationship between autistic symptoms and alcohol abuse.

Methods: Participants ($n=112$) were 18 years and over, and included TD persons with 1) very low scores on the AQ ($n=51$) and 2) no relative diagnosed with ASD, against individuals who had 1) a 1^o relative diagnosed with ASD but 2) had no ASD diagnosis themselves, while having 3) an AQ score >22 (TD_{BAP} , $n=14$). Participants completed the Alcohol Use Disorders Identification Test (AUDIT) and Adult Autism Spectrum Quotient (AQ).

Results: The hypothesis was supported. TD and TD_{BAP} individuals had different correlation matrices for problematic alcohol consumption and symptoms of ASD ($M=85.79$, $F_{(36, 1959.26)}=1.80$, $p<0.01$). As predicted, individual correlations assessed by Fisher’s-Z revealed groups differed significantly on a number of AQ and AUDIT subscales. While better communication skills were associated with reduced alcohol related problems in TD respondents, paradoxically with better communication TD_{BAP} respondents had increasing alcohol related problems.

Conclusion: These results reveal that TD_{BAP} and TD individuals differ in the relationship between AQ and AUDIT subscales. The directions of these correlations suggest that those persons on the BAP with improved communication skills may more likely develop problems with alcohol abuse.

Dr Mark Stokes - stokes@deakin.edu.au

Please note: This work was the work of Louise Dove in her Honours Degree. Louise passed away suddenly and unexpectedly 3 months into her PhD, on April 4th, 2014. This presentation is offered *in memoriam* of her and to the many people so deeply affected by her death; particularly her children Jamie and Alexander, her husband John, and her parents Brian and Rose Dove. Louise should be acknowledged as the primary author.

Presenting Author: TAN, Diana Weiting

Title: Sexually dimorphic facial features varying according to levels of autistic-like traits in the general population

Affiliation: School of Psychology, University of Western Australia

Co-authors Syed Zulqarnain Gilani, Suzanna N. Russell-Smith, Murray T. Maybery, Ajmal Mian, Peter R. Eastwood, Faisal Shafait, Mithran Goonawardene, Andrew J.O. Whitehouse

Background: In a recent study, Bejerot et al. (2012) observed that several physical features (including faces) of individuals with an autism spectrum disorder (ASD) were more androgynous than those of their typically-developed counterparts, suggesting that ASD may be understood as a 'gender defiant' disorder. These findings are difficult to reconcile with Baron-Cohen's (2002) 'extreme male brain theory', which proposes that ASD may be an exaggerated form of cognitive and biological masculinity.

Methods: In a two-part study, we first identified an optimal set of six facial features that best distinguished 107 Caucasian males and 101 Caucasian females using 3D facial images. We then examined these six features in typically-developing groups selected for high ($n = 46$) and low ($n = 66$) levels of autistic-like traits.

Results: We found that for each sex, four of the six sexually-dimorphic facial features significantly differentiated participants with high levels of autistic-like traits from those with low trait levels. Specifically, male participants with high trait levels had less masculinised features than males with low trait levels. As for females, three of the four significant features were less feminised in high-trait females compared to low-trait females. One feature was, however, inconsistent with the general pattern of findings and was more feminised among females who reported more autistic-like traits.

Conclusion: The current data provided support for Bejerot et al.'s (2012) androgyny notion since males and females with high levels of autistic-like traits generally showed less sex-typical facial features than those with low-trait levels.

Diana Weiting Tan - diana.tan@research.uwa.edu.au

Presenting Author: THOMAS, Simone

Title: Behavioural sleep problems in children with ASD-ADHD

Affiliation: Deakin University; Murdoch Childrens Research Institute

Co-authors Kate Lycett, Nicole Papadopoulos, Emma Sciberras, Nicole Rinehart

**** Please note that this presentation is part of a symposium on co-morbidity of ASD-ADHD and if accepted will be presented with abstracts submitted by Nicole Papadopoulos and Jessica Green.**

Background: Sleep problems are common in children with Autism Spectrum Disorder (ASD) and Attention Deficit/Hyperactivity Disorder (ADHD). To date, no research has examined sleep problems in children diagnosed with co-morbid ASD-ADHD. The study aimed to examine 1) if children with ASD-ADHD ($n=93$) or ADHD-alone ($n=299$) differed in types of behavioural sleep problems; and 2) child and family risk factors associated with sleep problems in children with ASD-ADHD.

Methods: Participants with a current ADHD diagnosis were recruited from the Sleeping Sound project. Sleep problems were measured the Children's Sleep Habits Questionnaire (CSHQ). Child risk factors (e.g. age, gender, medication use, ADHD severity, co-occurring internalising-externalising comorbidities) were assessed using the Anxiety Disorders Schedule of Children IV/Parent version) and family factors were assessed using the Depression Anxiety Stress Scale and the census-based Socio-Economic Index for Areas Disadvantage Index.

Results: Children with ASD-ADHD or ADHD-alone did not differ in sleep problem type or severity. A Hierarchical regression using child and family risk factors explained 23% of the variance in sleep problems ($F(9,76)=2.45, p=.02$) and the strongest risk factors for sleep problems in ASD-ADHD was internalising/externalising comorbidities ($B=.19$) and parent age ($B=-.19$).

Conclusions: The findings suggest that comorbid ASD does not exacerbate or change the nature of sleep problems experienced by children who have ADHD. The combination of internalising/externalising comorbidities in children may act as a red flag for the presence of a sleep problem for children in this group.

Presenting Author: TRIMMER, Emily
Title: **Feeling it on the inside but not on the outside: Emotional empathy in ASD**
Affiliation: University of New South Wales
Co-authors: Skye McDonald, Jacqueline Rushby

Background: Empathy can be defined as “natural tendency to share and understand the emotions and feelings of others in relation to oneself” (Jean Decety & Meyer, 2008, p. 1053). Empathy involves both a cognitive (understanding other’s intentions and meaning) and an emotional (feeling what another person is feeling) component. Individuals with Autism Spectrum Disorder (ASD) have been shown to have difficulties with cognitive empathy and perspective taking. Less is known about emotional empathy in these individual and the present literature is inconsistent. This study examines the emotional empathy of individuals with ASD whilst watching emotionally-driven stimuli.

Methods: Twenty-four individuals aged 16 or older (21 males; mean age 28 years) with a diagnosis of ASD and 25 matched controls (21 males, mean age 27) watched a series of five emotionally distressing film clips and five non-emotional clips. Participants then rated their mood and level of arousal on a 9-point Likert scale. Skin conductance was recorded as a measure of arousal. Heart rate and corrugator EMG were also recorded.

Results: No significant difference between the ASD group and the control group was found for skin conductance or heart rate, however there was a trend towards a higher level of arousal in the ASD group. The ASD group displayed significantly lower corrugator EMG responses to emotional videos than the control group.

Conclusion: Individuals with ASD may experience greater physiological arousal to emotionally-driven stimuli. However, when these responses are experienced they are not as obviously expressed, and therefore can go unrecognised by others.

Emily Trimmer - e.trimmer@student.unsw.edu.au

Presenting Author: UNWIN, Lisa
Title: **A prospective ultrasound study of prenatal growth in infant siblings of children with autism.**
Affiliation: Telethon Kids Institute, University of Western Australia
School of Psychology, University of Western Australia
Co-authors: Murray T. Maybery, Anthony Murphy, Wendy Lilje, Michelle Bellesini, Anna M. Hunt, Joanna Granich, Peter Jacoby, Cheryl Dissanayake, Craig E. Pennell, Martha Hickey, Andrew J.O. Whitehouse

Accelerated head growth during the first years of life is one of the most well-replicated findings in the biological study of ASD. An emerging methodology for examining the developmental trajectory prior to a diagnosis of ASD is to investigate siblings of affected individuals. The current study is the first prospective investigation of fetal growth in siblings of children with ASD. Two groups of pregnant women were recruited as part of the Pregnancy Investigation of Siblings and Mothers (PRISM) of children with ASD cohort in Perth, Western Australia. The ‘high risk’ group (n=23) consisted of pregnant women who have an existing child with a diagnosis of ASD and the ‘low risk’ group (n=36) consisted of pregnant mothers who have an existing child who has developed typically. Prenatal ultrasounds were procured at multiple time-points throughout the second- and third-trimesters, facilitating an examination of growth trajectories. Growth measurements were then compared for the high- and low risk fetuses. Mixed linear regression models identified no significant differences between the high- and low risk fetuses in their measurements of head growth, nor were there any significant differences between groups in the rate of head growth (all p -values $>.05$). Similarly, there were no significant differences observed when comparing high and low risk groups on a ratio of head circumference relative to body size ($\beta = -.019, p = .75$). Future studies may consider looking beyond the macro architecture of the prenatal brain and examine the growth of brain sub-regions that may be implicated in the presentation of ASD symptoms.

Lisa Unwin - lisa.unwin@research.uwa.edu.au

Presenting Author: VIVANTI, Giacomo

Title: Feasibility, effectiveness and predictors of outcome of children receiving the Early Start Denver Model in a group-based community childcare setting

Affiliation: Autism Specific Early Learning and Care Centre,
Olga Tennison Autism Research Centre, La Trobe University

Co-authors: The Victorian ASELCC Team

Background. The Early Start Denver Model (ESDM) is an early intensive behavioral intervention program for young children with an autism spectrum disorder (Rogers & Dawson, 2010) that has been shown to be effective in the context of a 1:1 intensive implementation. Despite the importance of these results, concerns are often raised regarding the sustainability of the ESDM in community based and group settings.

Aims. The purpose of this presentation is to (1) consider the features of the ESDM that are particularly appropriate for group based intervention, (2) document the feasibility and the effectiveness of the ESDM within a community-based group program and (3) illustrate some of the factors that have been found to predict better outcomes in this program.

Methods. Outcomes of 27 preschoolers with ASD undergoing 15–25 h per week of ESDM in the context of a long-day care community service (child-staff ratio = 1:3).over 12 months were compared to those of 30 peers with ASD undergoing a different intervention program delivered in a similar community long-day care service.

Results. Children in both groups made gains in cognitive, adaptive and social skills. Participants in the ESDM group showed significantly higher gains in developmental rate and receptive language.

Conclusions. This first controlled effectiveness study indicates that the ESDM may have positive effects on development of young children in the context of community-based group settings.

Dr Giacomo Vivanti - g.vivanti@latrobe.edu.au

Presenting Author: WADE, Susan

Title: Impact of autism on abilities and achievement in highly able individuals

Affiliation: Monash University

Co-authors Leonie Kronborg

The perceived impact of autism on abilities and achievement was investigated as part of a larger grounded theory study to explore talent development in individuals on the autism spectrum with high abilities. While most research has focussed on the deficits associated with autism, relatively little is known about educational provision for 'twice-exceptional' individuals on the autism spectrum - who are gifted and talented in addition to having a disability. The study design uses grounded theory methodology (GTM) in which initial data is collected via an online questionnaire from participants (adults with an autism diagnosis, parents, teachers, psychologists, mentors and coaches). Theoretical sampling informs the selection of highly able participants for follow-up interviews via email. Preliminary analysis of responses from 143 participants (Australia, North America and Europe) has been conducted using GTM procedures. This presentation will outline: (1) the positive and negative perceived impacts of autism on abilities and achievement raised by individuals on the autism spectrum represented in the study, and (2) participant attribute differences in those who viewed the autism impact positively and negatively. The results demonstrate the importance of *self-propelled learning* and high ability in relation to a perceived positive impact of autism. Understanding these perceived impacts of autism in highly able individuals on the autism spectrum will have practical educational implications for developing abilities relevant to multiple audiences (individuals on the autism spectrum, teachers, parents, mentors and psychologists).

Susan Wade - susan.wade@monash.edu

Presenting Author: WANG, Chongying

Title: Title of presentation: Developmental Surveillance of Infants and Toddlers: Early Identification of Autism Spectrum Disorders in Tianjin, China

Affiliation: Center for Behavioural Science, School of Medicine, Nankai University, Tianjin, China

Co-authors Gongshu Liu, Ying Liang, Jing Wang, Josie Barbaro, Cheryl Dissanayake

Objective: In order to improve the quality of child healthcare and to detect autism spectrum disorders (ASDs) at a younger age, we used the community-based three-level childcare network to conduct developmental surveillance for young children aged between 12 to 24 months during their regular child health check.

Methods: A total of 252 Child Health doctors from 62 community hospitals in all the six urban districts of Tianjin City, China, were trained on the early signs of ASDs at 12-, 18- and 24-months of age using Social Attention and Communication Surveillance (SACS) for this study embarked in May 2013. A cohort of 8,872 children was monitored on early social attention and communication behaviors using SACS.

Those infants/toddlers identified as “at risk” were referred to the city-level child health center from 12 months onwards for developmental and diagnostic assessments at 6 monthly intervals, until 24 months.

Results: To date, a total of 77 children have been identified as “at risk” for ASDs and referred for further assessment/diagnosis. These assessments are currently being conducted, and the outcomes of these will be presented.

Conclusion: We are finding that developmental surveillance of social and communication behaviors (SACS) is able to accurately identify children at risk for ASDs before two years old. Hence, it is recommended that all primary health care professionals should be trained on the early signs in order to facilitate early identification of ASDs.

Chongying Wang - chongyingwang@nankai.edu.cn



**ASFAR Conference
Poster Presentations**

Presenting Author: AHMED, Nusrat Yasmeen

Title: How stress level differs in parents of children with ASD, Downs Syndrome and typically developing children: Findings from Bangladesh

Affiliation: Director, Hope Autism Center, Bangladesh, and
ASD Specialist **Early Assessment Clinic**,
Olga Tennison Autism Research Centre
La Trobe University, Bundoora, Victoria 3086 Australia

Co Authors: Cheryl Dissanayake

Background: The lack of family and social support often cause stress in parents with children with special needs. This is especially true in developing countries where there is little societal acceptance and support for families. This study compared (i) stress levels between three groups of Bangladeshi parents having children with ASD, Downs Syndrome and typically developing children; and (ii) stress levels between mothers and fathers of children with ASD.

Method: 127 parents were selected 32 had Typically developing children; 30 with children with Down Syndrome; and 65 with children with ASD). The General Health Questionnaire 12 (GHQ-12) was completed by the parents.

Result: Stress level of parents with ASD children was significantly higher (than parents of typically developing children and children with Downs Syndrome. When Mothers' stress was significantly higher than fathers', and parents of older children and /or sons with ASD were more distressed than those with younger children and/ or daughters.

Conclusions: Increased parental stress amongst families of children with ASD reflect those from first world countries where the majority of research has been conducted. The increased distress of parents with older children with ASD highlights the necessity for provision of much needed support for these children. In developing countries like Bangladesh, where resources are limited, mothers play a vital role in the development of their children with ASD. Therefore mothers' wellbeing is crucial for better intervention of these children, emphasising the need to provide them with counselling and psychosocial support.

Dr Nusrat Yasmeen Ahmed - N.Ahmed@latrobe.edu.au

Professor Cheryl Dissanayake - c.dissanayake@latrobe.edu.au

Presenting Author: ALBEIN-URIOS, Natalia

Title: Non-invasive brain stimulation techniques as a therapeutic tool in autism spectrum disorders: A systematic review.

Affiliation: Cognitive Neuroscience Unit, School of Psychology, Deakin University

Co Authors: Peter G. Enticott

Background: Non-invasive brain stimulation techniques are novel procedures developed to treat a variety of disorders, most notably major depressive disorder. Recent research has examined whether these techniques, which include repetitive transcranial magnetic stimulation (rTMS) and transcranial direct current stimulation (tDCS), may have therapeutic utility in other conditions, including autism spectrum disorder (ASD). In view of growing evidence about the effectiveness of such techniques, the aim of this study is to systematically review studies involving non-invasive brain stimulation techniques in individuals with ASD.

Methods: We conducted standardised searches in the following databases: Medline Complete, CINAHL, Scopus, PsycINFO and Web of Science combining the terms "Autism, Asperger and Pervasive developmental disorder" with "Brain stimulation, Transcranial magnetic stimulation and Transcranial direct current stimulation". Subsequent results were filtered according to the following inclusion criteria: i) human studies; ii) participants who have received a formal diagnosis of ASD, autism, pervasive developmental disorder and Asperger disorder/syndrome and iii) design includes repeated measures comparisons of pre- versus post- brain stimulation outcomes iv) non-invasive brain stimulation techniques had to be used as a therapeutic tool.

Results: We reviewed all the literature published until the 28th of August 2014. The combined search yielded 414 titles; with all the filters applied and duplicates removed the search generated 250 titles. A total of 11 studies met inclusion criteria, which include studies of rTMS and tDCS that investigate both clinical and neurophysiological effects in ASD.

Discussion: There is preliminary evidence for the safety and efficacy of non-invasive brain stimulation in ASD, although this research is in its infancy. We discuss the future of non-invasive brain stimulation in ASD, and provide suggestions for future research directions.

Natalia Albein-Urios - natalia.albeinurios@deakin.edu.au

Presenting Author: ALVARES, Gail A.

Title: Impaired instrumental goal-directed behaviour in young adults with autism spectrum disorders

Affiliation: 1. Brain & Mind Research Institute, The University of Sydney;
2. Telethon Kids Institute

Co Authors: Bernard W. Balleine, Adam J. Guastella

Autism spectrum disorders (ASDs) are associated with persistent, stereotyped or repetitive actions and patterns of interest that are maintained despite possible negative outcomes. The aim of the present study was to investigate whether impairments in the ability to execute flexible goal-directed actions may be an underlying feature in ASD contributing to these clinical observations. Young adults diagnosed with ASD were recruited along with healthy controls and compared to a second clinical group comprising adults with social anxiety disorder (SAD). Using a translational behavioural task well validated in rodent models, participants were trained to make keyboard actions for food outcomes and then subsequently allowed to consume one outcome till satiety. In healthy controls, this outcome devaluation procedure reduced subsequent responding for actions predicting the devalued outcome, whilst maintaining responding on the other still-valued action. This indicated intact instrumental goal-directed responding in the healthy control group. However, both ASD and SAD participants were unable to demonstrate flexible goal-directed actions, seemingly insensitive to the change in outcome value on action control. This behavioural deficit was not due to impairments in outcome knowledge, as all groups exhibited appropriate awareness that one of the food outcomes had changed in value. This study demonstrates that individuals with ASD are unable to use changes in the environment to flexibly update their behaviour in the same context. This behavioural deficit may underlie the persistence of intrusive and restricted inflexible behaviours, representing a specific area for targeted behavioural interventions.

Gail A. Alvares - gail.alvares@sydney.edu.au

Presenting Author: ASHBURNER, Jill

Title: Overcoming the tyranny of distance: Delivering services to families of children with ASD in rural and remote locations

Affiliation: Autism Queensland, The University of Queensland

Co Authors: Sandy Vickerstaff

Background: Autism Queensland offers short-term, intensive programs that deliver individualized, trans-disciplinary support to children with autism spectrum disorders (ASD) throughout Queensland. They are typically conducted in the child's home and/or early childhood setting, and include a parent coaching component. In 2013, Autism Queensland was funded by the Australian Department of Social Services to explore the use of remote technologies to deliver this service.

Method: The study explored the lived experience of parents of young children with ASD and service providers of an early intervention service delivered via remote technologies, with a focus on parent coaching. The participants included four parents of children with ASD aged 2-6 years, eight rural service providers, and a metropolitan-based therapist specialising in ASD. A qualitative content analysis approach involving semi-structured interviews was used to explore the barriers and facilitators to using remote technologies, and their capacity to replace face-to-face sessions.

Results: The service via remote technologies was perceived to be more convenient in terms of cost, time and travel, and to enhance connections with and support of parents and local service providers. Parents perceived the capacity to access the service at home as helpful in reducing stress for parents and children, although in some instances technical difficulties increased parental stress. All participants suggested that remote technology should augment rather than replace face-to-face services.

Conclusions: The results provide preliminary support for the use of remote technologies to extend early intervention services to children with ASD and their families in rural/remote locations using a parent coaching model.

Dr. Jill Ashburner - Jill.Ashburner@autismqld.com.au

Presenting Author: BAKER, Emma

Title: Chronic Sleep Reduction and Psychopathology Symptoms in Adults with High-Functioning Autism Spectrum Disorder

Affiliation: Olga Tennison Autism Research Centre, La Trobe University

Co Authors: Amanda Richdale

Background: Insomnias are common co-morbidities reported by individuals with ASD, with resultant reduced total sleep time. Individuals with ASD are also reported to have a higher prevalence of anxiety and depressive disorders. However, the relationship between sleep, chronic sleep reduction, and psychopathology in individuals with ASD is unclear.

Methods: Fifteen adults with HFASD and 15 age- and sex-matched neuro-typical (NT) adults. Participants completed the Chronic Sleep Reduction Questionnaire (CSRQ), Patient Health Questionnaire, the State Trait Anxiety Inventory, and the Sleep Anticipatory Anxiety Questionnaire. Participants also completed a 14 day sleep/wake diary and actigraphy.

Results: Adults with HFASD had significantly higher scores on all questionnaire measures; effect sizes were large. CSRQ scores were significantly and strongly correlated with all psychopathology variables in the HFASD group; however correlations in the NT group were either moderate or strong, except depression which was not significantly correlated with CSRQ scores in this group. Several non-significant moderate correlations between diary and actigraphy variables and psychopathology variables were observed in each group; sleep variables were primarily correlated with sleep anxiety measures in the HFASD group and depression in the NT group.

Conclusions: The CSRQ measures symptoms of chronic sleep reduction and the impact of sleep debt. The impact of chronic sleep reduction is greater in adults with a diagnosis of HFASD and is highly associated with symptoms of psychopathology. Data has now been collected for 35 adults with ASD and is currently being analysed and will be available at the time of presentation.

Emma Baker - ek4baker@students.latrobe.edu.au

Presenting Author: BEKKALI, Soukayna

Title: An investigation of the effect of theta burst stimulation of the right cerebellar hemisphere on theory of mind

Affiliation: Cognitive Neuroscience Unit, School of Psychology, Deakin University

Co Authors: Melissa Kirkovski, Natalia Albein-Urios, Nahila Satari, Alan J. Pearce, Peter G. Enticott

Background: Theory of Mind (ToM) is a key aspect of social cognition, defined as the ability to judge another's mental and emotional state in order to understand their behaviour. Emerging research has revealed cerebellar involvement in social cognition, including ToM. Neuroimaging studies have also revealed cerebellar structural, cellular, and functional anomalies in autism spectrum disorder (ASD), where social cognitive deficits are common. We aimed to assess the role of the cerebellum in social cognition using a computerised ToM test ("Yoni" task) and repetitive transcranial magnetic stimulation (rTMS) to disrupt cerebellar activity.

Methods. Continuous theta burst stimulation (TBS; rTMS) was administered to the right hemisphere of the cerebellar region of 20 healthy, right-handed adults. Participants completed the "Yoni" task before and after stimulation in two separate sessions, one week apart. Participants received sham (placebo) TBS in one session and active TBS in the other.

Results. Overall, no significant differences in ToM performance were found between active and sham TMS conditions. However, non-parametric analysis revealed significant differences in accuracy of performance for second order cognitive ToM before and after active stimulation. This was not found in the sham condition.

Conclusions. These findings provide some initial support for the role of the right cerebellar hemisphere in ToM, and that TBS may have the capacity to facilitate cognitive ToM performance. We discuss implications for our neurobiological understanding of ASD.

Soukayna Bekkali - sbekkali@deakin.edu.au

Presenting Author: BUNTINE, Molly Kathleen¹

Title: Investigating the role of Tryptophan metabolism on ASD-associated behaviours in *Drosophila melanogaster*.

Affiliation:

1. Department of Genetics/School of Molecular Science , La Trobe University
2. School of Psychological Science, La Trobe University, Australia
3. Department of Zoology, School of Life Sciences, La Trobe University
4. Olga Tennison Autism Research Centre (OTARC), La Trobe University

Co Authors: Amanda Richdale⁴, Matthew Hale², Cheryl Dissanayake⁴, John Lesku³, Stephen Kent², and Gregory Somers¹.

Autism spectrum disorder (ASD) has a strong genetic component, thus the abnormal expression of genes involved in neurotransmission and neurodevelopment found in people diagnosed with ASD are of considerable interest in understanding its aetiology. Over 400 genes have been associated with ASD. However, due to the complexity of this disorder it is difficult to isolate the specific contribution of genes to the development of ASD behaviours and comorbid conditions (e.g., sleep, ADHD and social difficulties). Serotonin is an important neurotransmitter, generated by the metabolism of the amino acid tryptophan, and is thought to be important for regulating sleep, mood and cognition. Serotonin dysregulation has been associated with a diagnosis of ASD. Furthermore, approximately 80% of people diagnosed with ASD have sleep difficulties; approximately 50% have anxiety (including social anxiety), and at least 1 in 3 children with ASD show symptoms of ADHD.

Using the model organism *Drosophila melanogaster*, the vinegar fly, we investigated the role of genes involved in serotonin synthesis, in the regulation of sleep and social behaviour. The data being presented (currently unpublished) will demonstrate that this pathway not only regulates stable sleep patterns in the fly, but is also involved in social behaviours. It also highlights an important link between genetic disruption of this pathway and hyperactivity.

These results have significant implications for researchers seeking to understand the genetic factors contributing to ASD-related behaviours and comorbid conditions (particularly sleep disruption and hyperactivity) and contribute to the understanding of the molecular processes underlying this complex developmental disorder.

Molly Kathleen BUNTINE - mkbuntine@students.latrobe.edu.au

Presenting Author: BURROWS, Emma¹

Title: Automatic classification of mouse ultrasonic vocalizations based on neural control of auditory processing

Affiliation:

- ¹ Florey Institute of Neuroscience and Mental Health, The University of Melbourne
- ² Biomedical Engineering, The University of Melbourne
- ³ School of Psychological Sciences, The University of Melbourne

Co Authors: Eastwood, A.E.¹, Hannan., A.J.¹, Grayden, D.B.², McLachlan, N.³.

Mice emit ultrasonic vocalizations (USVs) in social contexts and the genetic basis of these signals can provide insight into disorders affecting verbal communication such as Autism Spectrum Disorder (ASD). There is evidence to suggest that patterns of calls influence behaviour and so likely constitute meaningful communications. The major challenge for quantitatively assessing differences in vocalisations lies in the quantity and complexity of data to be analysed. Current methods for classifying USVs involve protracted manual analysis, splitting ultrasonic vocalizations into call types based on visual inspection of spectrograms for the duration and shape of frequency changes of tonal components in the call (pitch contours). Visual estimation of acoustic variables from spectrograms by eye leads to uncertainty about what differences between calls represent a difference in call categorization, and problems of poor standardization and replication. Classifying USVs by using just median pitch and call rate addresses the problems inherent in visual inspection but fails to capture the information-rich pitch contours present in USVs. We present a novel algorithm for classifying USVs based on a neurocognitive model of sound and speech recognition. An earlier version of the algorithm applied to human speech successfully classified altered speech prosody in ASD patients. For this study the algorithm was adapted to the temporal, frequency and amplitude resolution of mouse hearing. This research will provide a critical link in our understanding of how mice use USVs to communicate and has relevance to numerous studies using mouse models for neuropsychiatric and communicative disorders.

Emma Burrows - emma.burrows@florey.edu.au

Presenting Author: CARR, Monica

Title: A sensitivity analysis of three nonparametric treatment effect scores for single-case research for participants with autism

Affiliation: Monash University, Melbourne, Australia

Co Authors:

The widely used Percentage of Nonoverlap (PND) treatment effect calculation was compared to more recently developed methods which, it has been argued, better account for outlying variables and trend in single-case design intervention studies. Percentage of All Nonoverlap (PAND) and Nonoverlap of All Pairs (NAP) were selected for comparison as both are amenable to hand calculation, making them widely accessible to clinicians and teachers as well as researchers. A data set was developed through a systematic search of peer-reviewed literature on self-management interventions conducted with participants with autism spectrum disorder (ASD). Treatment effect sizes derived from each method were compared for studies that provided sufficient data. Results indicated that PND provided a conservative measure of strength of treatment effect when compared to PAND and NAP scores. Interpretation scales for treatment effect scores derived from each method were reviewed. Implications for selecting a calculation method for participants with ASD are discussed.

Monica Carr - mebar4@student.monash.edu

Presenting Author: CAULFIELD, Hayley & POGOS Danielle

Title: Is the role of facial mimicry in emotion recognition influenced by level of autistic traits?

Affiliation: Monash University

Co Authors: Angelika Anderson, Nicole J. Rinehart, Peter G. Enticott

Background: Facial emotion recognition is facilitated by mimicry of facial expression, attributed to the mirror neuron system. Accordingly, blocking mimicry impairs emotion recognition in neurotypical individuals, resulting in difficulties akin to those seen in autism spectrum disorder (ASD). This study sought to investigate the extent to which individuals with differing levels of sub-clinical autistic traits rely on facial mimicry to recognise emotion.

Method: Across two experiments, separate groups of healthy adult females ($N=99$) completed a facial emotion recognition task under two conditions: blocking of facial mimicry (biting down on a stack of tongue depressors) and a control condition (supporting the tongue depressors between their fingers). The task in experiment one involved intensive displays of the six basic emotions, while the task in experiment two involved faces showing fear, surprise, or a morphed combination of the two. Participants also completed the Adult Autism Spectrum Quotient (AQ).

Results: While no significant effects of blocking mimicry on facial recognition were found overall in either experiment, experiment two indicated a significant interaction between condition (blocking vs non-blocking), emotion, and level of autistic traits ($p=.019$, $\eta^2=0.10$). Further analysis indicated that participants with high autistic traits demonstrated poorer accuracy of recognition of morphed fear/surprise when mimicry was blocked ($p=0.015$, $r^2=0.58$).

Conclusion: These findings suggest that individuals with high (but sub-clinical) levels of autistic traits do rely on mimetic processes. Impaired emotion recognition when mimicry was disrupted might indicate that the mirror neuron system is more vulnerable to disruption in these individuals.

Hayley Caulfield - hayley.caulfield@gmail.com

Danielle Pogos - daniellepogos@gmail.com

Presenting Author: CHEN, Yu-Wei

Title: Everyday experience in adults with Asperger's syndrome/high functioning autism: An experience sampling study

Affiliation: Faculty of Health Sciences, The University of Sydney, Australia

Co Authors: Anita Bundy, Reinie Cordier, Stewart Einfeld

Background: Knowledge about time use and experience in everyday life among individuals with Asperger's syndrome/high functioning autism (AS/HFA) can help identify needs and targets for intervention. The study aimed to investigate everyday participation in adults with AS/HFA along with their perceptions and feelings regarding the experience by using experience sampling methodology which allows collecting information in real time across daily contexts.

Methods: Fourteen Australians (4 males; 16-43 years) and 16 Taiwanese (12 males; 19-45 years) with AS/HFA were asked to carry an iOS device which prompted them randomly, 7 times/day for 7 days, to record what they did, with whom, and how they perceived and felt in the situation. Multilevel analyses were used to identify relationships among perceptions, feelings and activities.

Results: Participants most frequently engaged in solitary leisure but occasionally in social activities, in which they mainly interacted with friends. Multilevel analyses showed that they were more likely to experience higher levels of anxiety while engaging in social activities. However, a positive relationship between greater involvement and social activities was found. Further, higher levels of interest and enjoyment were both positively associated with social activities and solitary/parallel leisure. We did not find any significant associations between everyday activities and perceiving the situation as difficult. No moderating effects of gender or country were identified.

Conclusion: Adults with AS/HFA are motivated for and enjoy everyday social engagement. However, intervention services may need to target anxiety management to enhance the experience of social participation.

Yu-Wei Chen - yu-wei.chen@sydney.edu.au

Presenting Author: COSTLEY, Debra

Title: **We Belong Too: the experiences, needs and service requirements of adolescents with autism spectrum disorder**

Affiliation: Autism Spectrum Australia (Aspect)

Co Authors: Susan Bruck

This research project innovatively surveyed adolescents with autism spectrum disorder (ASD) at the higher functioning (HFA) end of the spectrum with the aim of developing a profile of their life experiences, aspirations and their future support needs. The study also surveyed parents of adolescents with HFA. Anonymous surveys were returned by 100 adolescents and 65 parents. All states and territories were represented and there was a 2:1 breakdown of males to females in the adolescent population.

The findings from this study demonstrate that adolescents with ASD aged between 12 and 17 years of age need more support in the school classroom, managing bullying and discrimination, coping with stress and making friends. There is a possible link between the lack of friends, the struggle to understand what is expected in the classroom and to complete class work and the reported anxiety and stress for this group of young people.

The outcomes from the parent survey reported a shortage of coordinated, appropriate and affordable ASD specific support services. The findings predict that in the longer-term, the adolescents will need ongoing support with finding and managing employment, and independent living. However, the young people who responded to the survey were looking forward to getting a job, gaining their independence and travelling. These aspirations are not that different to any other adolescent but it is the role of governments and the community to ensure they can access these opportunities in order to achieve their potential.

Dr Debra Costley - dcostley@autismspectrum.org.au

Presenting Author: COSTLEY, Debra

Title: **Optimising the recruitment and retention of participants in longitudinal studies for autism spectrum research: A mixed methods study**

Affiliation: 1. Autism Spectrum Australia (Aspect)
2. Cooperative Research Centre for Living with ASD (Autism CRC)

Co-authors: Kaaren Haas¹

The recruitment and retention of adults on the autism spectrum into research poses difficulties; longitudinal studies face particular challenges. To date, factors influencing the recruitment and retention of adults for autism spectrum research have been unexamined in the literature.

This paper reports on a mixed methods study undertaken in 2014 for the Cooperative Research Centre for Living with Autism Spectrum Disorders (Autism CRC) to identify motivators and barriers to participation of adults in longitudinal autism spectrum research.

Conducted across four Australian states, the study enlisted 167 participants in four categories: high functioning autism/Asperger's adults; adults on the autism spectrum with an intellectual disability, and their carers; and neurotypical adults. Quantitative and qualitative data was collected via a card sort exercise, focus group discussions, interviews, questionnaire and online survey.

The study found the motivators, inhibitors and enablers of participation differed distinctly both between and within each category of participants.

While helping others was a key motivator across all categories, participants also sought 'personal benefit' from participation. 'Personal benefit' differed markedly between categories; for adults on the autism spectrum, it was interpreted according to their individual preferences and needs.

Results indicate that key inhibitors are the inconvenience of time and travel required, and insensitivities in the research process to an individual's needs and preferences for engaging with the world and others; maximising choice for all aspects of participant involvement is a vital enabler; and the use of financial and other extrinsic rewards is problematic.

Implications for future research are also canvassed.

Dr Debra Costley - dcostley@autismspectrum.org.au

Presenting Author: DASS, Alena

Title: A randomised controlled trial of Fish Oil Supplementation for children with Autism Spectrum Disorder (ASD)

Affiliation: Telethon Kids Institute¹, University of Western Australia School of Paediatrics and Child Health², University of Western Australia Centre for Neonatal Research and Education, University of W.A. School of Psychology and Social Science, Edith Cowan University⁴

Co Authors: Suzanne Meldrum^{2,3,4}, Andrew Whitehouse^{1,2}, Karen Simmer^{2,3}

Objective: To determine the safety and feasibility of a randomised controlled trial of high dose fish oil supplementation for improving the neurodevelopment of children with Autism Spectrum Disorder (ASD). From a planned study of 50 children, data from the first 25 participants have been analysed.

Methods: Twenty-Five children (aged 2-6 years) with a diagnosis of ASD were recruited across Western Australia. Children were randomised to receive either 2ml Fish Oil (355mg DHA, 725mg EPA) or 2ml placebo sunflower oil (formulated to smell and taste like Fish Oil) per day for 6 months. Neurodevelopmental assessments were conducted prior to randomisation and following supplementation. Compliance was measured through a count of returned unused doses and a parental daily diary. Monthly phone calls were made to participants to monitor compliance and any adverse events.

Results: The groups did not significantly differ in the number of days the supplement was provided (90% of doses completed in the treatment group versus 87% in the placebo group, $p = 0.71$). The number and severity of side effects in the placebo group were similar and did not warrant withdrawal from the trial. Five out of ten participants from the placebo group (50%) correctly guessed their group allocation compared to three out of nine (33.4%) participants from the treatment group, indicating successful supplement blinding.

Conclusion: This RCT study appears to have feasibility. The supplement compliance was adequate and blinding of the randomisation was successful. Recruitment should continue to obtain sufficient statistical power to provide the most rigorous test of whether fish oil may improve the neurodevelopment of children with ASD.

Funded By: University of Western Australia (Near Miss Early Career Grant)

Alena Dass - alena.dass@telethonkids.org.au

Presenting Author: DATE, Perrin

Title: Using video-modelling to teach a 3 year old child with ASD how to dress himself.

Affiliation: Monash University

Co Authors: Angelika Anderson, Dennis Moore

This study uses video-modelling (VM) to teach a 3 year old child with ASD how to dress himself. Prior to the implementation of this ABA-style approach, the subject was entirely dressed by his parents. The experiment contained a mix of peer modelling and point-of-view VM, as well as a forward-chaining procedure. Although the experiment is still in progress, the child has thus far made significant gains in self-dressing behaviour. Thus this study is adding to the growing body of the literature in support of using video-modelling to teach ASD individuals socially important skills.

Perrin Date - pj.date@gmail.com

Presenting Author: DAVIS, Tessa & PAPADOPOULOS Con

Title: Identifying Autism Early – The Toddlers at Risk of Autism Clinic (TRAC) Model

Affiliation: Kogarah Developmental Assessment Service, NSW

Co Authors: Deirdre Clifton

Aim: This paper describes the Toddlers at Risk of Autism Clinic (TRAC), which utilises the Social and Communication Scale (SACS) and/or Autism Detection in Early Childhood (ADEC) play-based assessments to facilitate the early diagnosis of autism. Early intervention benefits children with autism, yet diagnosing toddlers with an Autism Spectrum Disorder is challenging. It has been acknowledged that more efficient diagnostic processes may help alleviate long waiting lists and parental concerns. This paper describes an efficient and reliable model to facilitate diagnosing autism in toddlers. It also demonstrates the viability of using SACS and ADEC autism screening tools as a diagnostic aid.

Methods: A retrospective audit was conducted of all 42 children assessed over a three-year period in the TRAC. A semi-structured interview and play-based assessment (SACS & ADEC) were used to aid experienced clinicians in diagnosing autism. Intervention was recommended and families were routinely followed up. Analysis was conducted on the tools used, the outcomes of assessment, diagnosis, and stability of diagnosis on follow-up.

Results: During this period, 35 boys and 7 girls were assessed, with a mean age of 25 months. The average waiting time for clinic was 11.6 weeks. 25 patients were diagnosed with autism. 90.5% of toddlers given an initial diagnosis retained that diagnosis at follow-up. Out of the 17 children who were not diagnosed with autism in the TRAC, one child was later diagnosed with autism.

Conclusion: Experienced clinicians can confidently use the SACS and/or ADEC to assist with a DSM diagnosis of autism in toddlers.

Tessa Davis - tessardavis@me.com

Presenting Author: DONALDSON, Peter

Title: Are gaze patterns and autism-relevant traits related to inferred mirror neuron activity?

Affiliation: Cognitive Neuroscience Unit, School of Psychology, Deakin University

Co Authors: Caroline Gurvich, Jo Fielding, Peter G. Enticott

The parietofrontal mirror neuron system (MNS) is hypothesised to be involved in social cognition, and has been linked to autism spectrum disorder (ASD). Given that visual attention and processing in ASD are understood to be atypical, visual input to the MNS may also be aberrant. To examine the relationships between gaze pattern, interpersonal motor resonance (IMR; an index of putative MNS activity), and Autism-Spectrum Quotient (AQ), healthy right-handed participants aged 18-40 (n = 26) viewed videos of transitive grasping actions or static hands, whilst the left primary motor cortex received single-pulse transcranial magnetic stimulation (TMS). Motor-evoked potentials (MEPs) recorded in contralateral hand muscles via electromyography were used as an index of IMR. Participants also underwent eyetracking analysis to assess gaze patterns whilst viewing the same grasping videos, and completed the AQ. A test-retest group (n = 10) viewed the same videos twice while undergoing eyetracking, with a brief interval between viewings. No relationship was observed between AQ and IMR or gaze pattern. However, IMR tended to be positively associated with fixation counts in areas of biological motion in the videos, and negatively associated with object areas. It is possible that MNS atypicalities might be influenced by visual processes such as aberrant gaze pattern.

Peter Donaldson - pdonalds@deakin.edu.au

Presenting Author: DONALDSON, Rosie
Title: Protein and mRNA expression analysis of autism risk-genes
Affiliation: Department of Microbiology, La Trobe University
Co Authors: Naomi BISHOP

Autism spectrum disorder (ASD) is a common highly-heritable behaviourally-defined condition, that is heterogeneous in presentation and genetics. Genetic mutations implicated in ASD vary both in penetrance and disorder specificity, and no single genetic alternation accounts for more than a small percentage of ASD cases. Furthermore, ASD rarely occurs 'alone', and other conditions and disorders are frequently co-diagnosed in individuals with an ASD diagnosis. For example, intellectual disability, epilepsy, attention deficit-hyperactivity disorder, epilepsy, otitis media, hearing problems, and dysmorphic features, are often reported in those with ASD. Other common ASD comorbidities are gastrointestinal problems, immune system abnormalities, macro- or micro-cephaly, and even decreased bone density.

The presence of commonly co-occurring signs and symptoms in those with ASD, many of which impact on tissues and cells outside of the brain, led us to examine the cellular and tissue-expression profiles of a range of autism risk genes. We analysed microarray and protein expression profiles of more than 100 ASD-implicated genes. Our latest data will be provided and the implications for the aetiology of both ASD and its comorbid-conditions will be discussed.

Rosie Donaldson - rldonaldson@students.latrobe.edu.au
Dr Naomi Bishop - N.Bishop@latrobe.edu.au

Presenting Author: DRINKWATER, Caroline Patricia
Title: Gut dysfunction in autism spectrum disorder: characterisation of the microbiota of the colon in NL3^{R451C} mice
Affiliation: Department of Microbiology, La Trobe University
Co Authors: Naomi Bishop, Ashley Franks, Elisa Hill, Joel Bornstein

Gastrointestinal (GI) dysfunction is a common comorbidity in patients with autism spectrum disorder (ASD). A recent meta-analysis indicated that one in four children with ASD suffer from GI issues. The intensity of these GI issues is also potentially correlated with the severity of ASD, and vice versa.

Both changes in the gut microbiota and inflammation of the GI tract are known to influence GI function. It is possible that GI dysfunction affects neurodevelopmental disorders, as it interferes with a connection known as the gut-brain axis. This axis allows neural, immunological and hormonal communications to occur from the brain to gut, and also from gut to brain including modulation of brain and behaviour by the gut microbiota.

To investigate GI dysfunction associated with ASD, we used mice expressing a human mutation associated with ASD. These NL3^{R451C} mice express an Arginine to Cysteine substitution mutation in the postsynaptic cell-adhesion molecule, Neuroligin-3. Histological and molecular techniques were utilized to investigate GI inflammation, and abundance and location of key bacteria in the colon of NL3^{R451C} and wild type adult male mice, to uncover the possible role the gut microbiota has on the severity of GI dysfunction in ASD.

Caroline Patricia Drinkwater - cpdrinkwater@students.latrobe.edu.au

Presenting Author: ENGLISH, Michael
Title: Individuals with autistic-like traits show reduced lateralization on a greyscales task.
Affiliation: School of Psychology, University of Western Australia
Co Authors: Murray T Maybery & Troy AW Visser

Individuals with autism spectrum conditions attend less to the left side of centrally presented face stimuli compared to neurotypical individuals, suggesting a reduction in right hemisphere activation. However, it is unclear if this difference extends to non-facial stimuli. We measured spatial attention bias using the "greyscales" task in a large sample of neurotypical adults

rated above- or below-average on the Autism Spectrum Quotient and found that leftward bias was reduced for the above-average group, suggesting that an attenuated bias extends across stimuli and to the broader autistic phenotype. Finally, a negative correlation between leftward bias and the Social Skills factor of the quotient provides additional evidence for a link between atypical hemispheric activation and social difficulties in autism spectrum conditions.

Michael English - michael.english@uwa.edu.au

Presenting Author: FIENE, Lisa

Title: Investigating Interoception in Adults with and without Autism Spectrum Disorder

Affiliation: University of Southern Queensland

Co Authors: Charlotte Brownlow

This study aimed to investigate the current gap in the literature with regard to how adults with and without Autism Spectrum Disorder (ASD) interpret the interoceptive sense, which includes thirst, hunger, tiredness and the prediction of onset of illness. Adults with a diagnosed ASD ($n = 74$; 36 males, 38 females) were compared to a control group ($n = 228$; 53 males, 174 females, 1 unspecified) in their self-reported perceptions of body awareness utilising the Body Awareness Questionnaire (BAQ) and thirst awareness using the Thirst Awareness Scale (TAS). Consistent with predictions, those in the ASD group reported a clinically significant lower body and thirst awareness compared to the control group, and this was a large effect (BAQ; $M_{diff} = -23.43$, $p < .001$, $d = -1.26$, 95% CI [-17.77, -29.09]; TAS; $M_{diff} = -3.99$, $p < .001$, $d = -1.02$, 95% CI [-2.82, -5.16]).

Keywords: autism, Asperger's Syndrome, interoception, body awareness, ASD, thirst

Lisa Fiene - Lisa.Fiene@usq.edu.au

Presenting Author: GARRICK, Barb & WINTER Satine

Title: Bauman and autism as a product

Affiliation: Griffith University, Brisbane, Queensland

Co Authors:

This paper reports on research undertaken to determine the origin of "autism as a product" in the Australian autism policy landscape. We draw on the research of Zygmunt Bauman (2007, 2012), who writes of consumers in modernist societies and how consumers play a dual role in being both the object and subject of desire, want, and need simultaneously. Australian "parents as consumers", have voiced their need for support for their children with autism and the Australian government responded with the *Helping Children With Autism* package; now an object of parents' desire. Davies (2014) makes a stronger case in relation to consumers of autism and the creation of "autism as a product" by observing that autism is now discursively popular. The phenomena of autism in popular culture through shows such as *The Big Bang Theory*, *The Bridge*, and *Parenthood* has both popularised the disorder and made it desirable. Also advocates such as Temple Grandin have helped an activist culture emerge. We agree with Davies, however, that autism as a product exists primarily discursively and is talked into being each time regulatory norms are used during and after diagnosis (Davies, 2014). The HCWA package plays a discursive role in this definition and re-shaping. While policy makers and government officials affected by neoliberal notions of consumer choice imagine that parents are offered choices in the HCWA package, we argue that in actuality there are limited options. The paper will show how we have adapted Bauman's cycle of consumerism to the notion of "autism as a product".

Dr Barbara Garrick - b.garrick@griffith.edu.au

Satine Winter - satine.winter@griffith.edu.au

Presenting Author: GARRICK, Barb & WINTER Satine

Title: The product of autism and policy in a consumer culture

Affiliation: Griffith University, Brisbane, Queensland

Co Authors:

This paper reports on research undertaken to determine the origin of "autism as a product" in the Australian autism policy landscape. We draw on the research of Zygmunt Bauman (2007, 2012), who writes of consumers in modernist societies and how consumers play a dual role in being both the object and subject of desire, want, and need simultaneously. Australian parents, as consumers, have voiced their need for support for their child with autism and the Australian government responded with the *Helping Children With Autism* package; now an object of parents' desire. Davies (2014) makes a stronger case in relation to consumers of autism and the creation of "autism as a product" by observing that autism is now discursively popular. The phenomena of autism in popular culture through shows such as *The Big Bang Theory*, *The Bridge*, and *Parenthood* has both popularised the disorder and made it desirable while advocates such as Temple Grandin have helped an activist culture emerge. We agree with Davies, however, that autism exists primarily discursively and is talked into being each time regulatory norms are used during diagnosis (Davies, 2014). The HCWA package plays a discursive role in this definition and re-shaping. While policy makers and government officials affected by neoliberal notions of consumer choice imagine that parents are offered choices in the HCWA package, we argue that in actuality there is limited options. The paper will show how we have adapted Bauman's cycle of consumerism to "autism as a product" that parents consume.

Dr Barbara Garrick - b.garrick@griffith.edu.au
Satine Winter - satine.winter@griffith.edu.au

Presenting Author: GATELY, Jacqueline

Title: The parental experience of assessing and accessing early intervention for children with autism and autism-like challenges.

Affiliation: Monash University

Co Authors:

Background: Parents and primary care-givers of young children with a recent diagnosis of autism or with similar challenges are faced with a daunting task. While coming to terms with a confusing life-long developmental condition in their child, they must select the most appropriate intervention during this reportedly crucial early developmental stage. Parents must assess a plethora of early intervention strategies, each developed with an emphasis on different aspects of the highly heterogeneous range of possible autism challenges. Information regarding the numerous intervention strategies is plentiful, from a range of sources of varied quality. Peer-reviewed research into the efficacy of treatment types is of debatable use for parents new to autism, given the heterogeneity of autism characteristics and the difficulty in controlling for confounding factors in autism research. Confusing funding systems, high costs and time-commitments for the most widely-recommended intensive therapies, variable service delivery models and differences in services offered between regions add to the confusion faced by highly-traumatised families.

Methods: An online survey to parents and primary care-givers of young children with autism and autism-like challenges will gather qualitative and quantitative information regarding (1) the therapeutic needs of children accessing intervention, (2) the information-gathering process that parents undertake to assess early intervention options, including funding, and (3) the experience of accessing intervention that is appropriate to the child's therapeutic needs, in Victoria, Australia.

Results & Conclusions: It is anticipated that the results and conclusions of this minor research thesis will be reportable by the ASfAR conference.

Jacqueline Gately - Jacqui.gately@monash.edu

Presenting Author: GRANT, Megan

Title: Parent-child communicative interaction in dyads with children with Autism Spectrum Disorders and typically-developing toddlers

Affiliation: Olga Tennison Autism Research Centre, La Trobe University

Co Authors: Kristelle Hudry & Katherine Crea

While it is unsurprising that parent-child interaction may become disrupted where dyads include a child with autism spectrum disorders (ASD), the precise reason for this disruption remains to be clearly delineated. This study investigated dyadic interaction in two samples; dyads including children with ASD, and those including typically-developing (TD) toddlers to quantify the features of dyadic interaction and confirm whether less optimal contributions are specific to ASD-dyads. Parent-child interaction videos and other data were collated across three independent projects. Three key interaction features were coded using the Dyadic Communication Measure for Autism (DCMA; Hudry et al., 2013); parent synchronous contributions, child initiated contributions, and dyadic shared attention. Coding was completed on 8-minute segments of parent-child free-play interaction. Parents of children with ASD were found to be no more synchronous than parents of TD toddlers, and children with ASD were found to make similar rates of initiations compared to TD toddlers. Group difference did present, however, in terms of shared attention, with ASD-Dyads sustaining less shared attention than TD-Dyads. Furthermore for ASD-dyads, several significant associations presented between codes for the interaction behaviours and clinical child characteristics (i.e., symptom severity, non-verbal age equivalence), with few such associations apparent among TD-Dyads. This suggests a relative inter-connectedness among child skills and parent and child interaction contributions in the context of ASD, which may not be a normative phenomenon. A working hypothesis regarding the mechanisms underpinning parent-child interaction patterns in ASD-Dyads is proposed, which will require future confirmation through longitudinal investigation.

Megan Grant - 15802550@students.latrobe.edu.au

Presenting Author: GROVE, Rachel

Title: Factorial structure of the Social Communication Questionnaire and the DSM-5

Affiliation: School of Psychiatry, University of New South Wales

Co Authors: Valsamma Eapen, Jessica Paynter, Giacomo Vivanti, Cheryl Dissanayake

Autism spectrum disorders (ASD) have been historically conceptualised as a triad of impairment in social interaction, communication and repetitive behaviour and restricted interests including in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). However, in a recent revision released in May 2013 (DSM-5), this has been reduced to two domains, combining the social interaction and communication difficulties associated with ASD. The Social Communication Questionnaire (SCQ) is a 40-item parent report measure designed to evaluate communication skills, social functioning and repetitive behaviours in children with a suspected diagnosis of ASD. The dichotomous items of the SCQ can be combined to give a total score, with higher scores indicating the presence of more autistic traits. Three subscales mapping onto the triad outlined in DSM-IV were also included in the development of the measure. However, there is limited research evaluating the three-factor structure of the SCQ. Furthermore, it remains to be determined whether the SCQ aligns with the new dyadic structure proposed by DSM-5. This paper will present results utilising data collected at the Autism Specific Early Learning and Care Centres in New South Wales, Victoria and Queensland to evaluate the factor structure of the SCQ. This study evaluated the relative fit of a one (total score), two (DSM-IV) and three (DSM-5) factor model amongst preschool children in Australia. Results have implications for research and clinical practice.

Rachel Grove - r.grove@unsw.edu.au

Presenting Author: HATFIELD, Megan^{1,2}

Title: **Pathway to Employment: Development of a protocol to assist adolescents with Autism Spectrum Disorders (ASD) with their transition from school to employment**

Affiliation: 1. Curtin University and
2. Cooperative Research Centre for Living with Autism Spectrum Disorders (Autism CRC)

Co Authors: Torbjorn Falkmer^{1,2}, Marina Circarelli^{1,2}, Marita Falkmer^{1,2} and
Nina Murray^{1,2}

Currently there are low rates of employment of people with high functioning Autism/Asperger Syndrome (HFA/AS). These individuals often have the skills and motivation to participate in employment, but face a unique set of challenges to achieving this goal. Despite this, there are very few HFA/AS specific protocols that assist individuals to plan for their transition from school into employment. For the protocols that do exist, there is limited evidence supporting their efficacy for this target population. This presentation will describe the results from the beginning phases of a project that aims to develop a protocol to assist individuals with HFA/AS to plan for their transition to employment. This will include results from:

- An environmental scan, which determined strengths and weaknesses of current transition planning processes for adolescents with HFA/AS. This consisted of an online survey and interviews with adolescents and young adults with HFA/AS, their families and the professionals who work with them in this process.
- A systematic review describing the psychometric properties and clinical utility of tools used in career planning for people with disability; and
- A review of the grey literature which scoped non-ASD specific transition protocols in order to be able to take advantage of aspects of existing protocols.

A summary of the results from these phases will be presented, followed by a discussion about the design of the new protocol and the upcoming randomised controlled trial to determine its efficacy.

Megan Hatfield - megan.hatfield@curtin.edu.au

Presenting Author: HEDLEY, Darren

Title: **Language Profiles in Toddlers with Autism Spectrum Disorder and Developmental Delay**

Affiliation: Nationwide Children's Hospital

Co Authors: Rose Nevill, Natalie Fields, Jonathan Wilkins, James Mulick, &
Eric Butter

Toddlers with ASD have been found to exhibit general language delay, better expressive than receptive language skills and delayed verbal relative to nonverbal skills. Further, poor receptive relative to expressive ability in ASD may be more severe compared to children with developmental delays (DD). We used binary logistical regression modelling to evaluate the contribution of a) expressive-receptive and b) verbal-nonverbal profiles as predictors of diagnosis in toddlers with ASD and DD. Thus, we were particularly interested in the contribution of interaction variables to the models. Forty-nine toddlers 19-39 months diagnosed with DD or ASD were assessed by a multidisciplinary team using the ADOS-2, Mullen (MSEL) and the Preschool Language Scales (PLS-5; Auditory Comprehension, AC, Expressive Comprehension, EC). Age equivalent scores were used in all analyses to control for floor effects. MSEL_VR and MSEL_FM scores were used to derive nonverbal ability (NVA) and MSEL_EC and MSEL_RC scores were combined to determine verbal ability (VA). Children with DD returned significantly higher scores on all variables than children with ASD; both groups returned stronger AC than EC scores and stronger NVA than VA. Two binary logistical regression analyses were conducted (Model 1: VA, NVA [Step 1], VA*NVA [Step 2]; Model 2: AC, EC [Step 1], AC*EC [Step 2]) with diagnostic classification as the dependent variable to explore the contribution of unique language profiles to diagnosis. Interaction effects significantly improved the models offering support to the notion of unique language profiles in ASD. However, general development level was the best predictor of diagnosis overall.

Darren Hedley - DarrenHedley@gmail.com

Presenting Author: HOCKING, Darren

Title: The interplay between early motor deficits and later socio-communicative outcomes in children with autism spectrum disorder

Affiliation: OTARC, La Trobe University – School of Psychological Science

Co Authors: Deniz Ozbilgin, Josephine Barbaro

Although social, communication and motor deficits are defining characteristics of children with autism spectrum disorder (ASD), the extent to which early motor abnormalities relate to later socio-communicative outcomes has not yet been fully explored. Here we examined the shared and unique contributions from early motor skill domains (fine motor, posture, gait) to later socio-communicative outcomes in young children with ASD. Observational assessments were used to code retrospective videos of at risk children at both 24 and 36 months referred from a community-based setting as part of the Social Attention and Communication Study (SACS). Two independent observers rated aspects of gait and postural control on scales derived from previous motor studies in children with ASD, and fine motor was assessed on the Mullens Scale of Early Learning. Results indicated that both fine and gross motor domains showed unique contributions to later 'social affect' severity scores at 36 months as measured by the Autism Diagnostic Observation Schedule (ADOS). These early motor domains were unique predictors of socio-communicative outcomes even when controlling for measures of family characteristics and cognitive processes (nonverbal problem solving). These findings have significant implications for early intervention strategies that focus on improving motor skills in children at risk for ASD rather than traditional approaches that primarily target only socio-communicative and behavioural concerns.

Dr Darren Hocking – d.hocking@latrobe.edu.au

Presenting Author: HUDRY, Kristelle

Title: A longitudinal evaluation of parent-child interaction in the context of toddlers at high-risk of autism

Affiliation: Olga Tennison Autism Research Centre,
School of Psychological Science, La Trobe University

Co Authors: Megan Grant, Rachael Bedford, Greg Pasco, Vicky Slonims,
Jonathan Green, Mayada Elsabbagh, Mark H. Johnson, Tony Charman, & the BASIS Team

Dyadic interaction is challenging for children with ASD and their social partners alike as children initiate little and parents often adopt more directive rather than responsive styles. Parent responsive interaction has been shown to facilitate later child social-communication skills (e.g., Green et al., 2010; Siller & Sigman, 2002). However, little is yet known about parent-child interaction as ASD is emerging, during infancy and toddlerhood. Within a familial high-risk design, parent-child interaction was evaluated longitudinally around toddlers' 1st, 2nd and 3rd birthdays. Among 100 toddlers, 52 were at high-risk of ASD (with 17 developing ASD by 3 years) and 48 were low-risk controls. Parent-child interaction samples were coded by blinded research assistants for a) parent synchronous and asynchronous communication acts and b) child initiations and responses, to elucidate at what developmental point and in what sequence parent and child contributions might become differentiated for dyads with toddlers developing ASD vs. those developing more typically. While children developing ASD were observed to increase their initiated contributions across toddlerhood, this was less so than that observed for other children, with group-level differences apparent from the second birthday. Further, parents of the children with ASD did not show the normative increase in synchrony observed between the second and third birthdays of toddlers without ASD. These findings provide downward extension from past research on interaction between parents and their older children with established ASD diagnoses, and suggest that early differentiation of child interaction behaviours may precede any differential parent contributions.

Kristelle Hudry - k.hudry@latrobe.edu.au

Presenting Author: ILIAS, Kartini

Title: **Symphony of Sound: The Importance of Mixed-Methods Research with Families of Children with Autism Spectrum Disorder (ASD)**

Affiliation:

1. Faculty of Health Sciences, MARA University Technology, Malaysia
2. Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia
3. School of Psychological Sciences, Faculty of Biomedical and Psychological Sciences, Monash University Australia

Co Authors: Kim Cornish, Karen Jennifer Golden

This presentation will emphasize the value of utilizing mixed-methods research methodologies in research with families of children with Autism Spectrum Disorder (ASD), especially in the Australasian region. ASD is a neurodevelopmental disorder that affects not only the child, but the family as well. A substantial body of research exists examining parents of children with ASD quantitatively, especially in Western contexts. However, more limited research has utilized a qualitative or a mixed-methods approach to explore the experiences, stress, and resilience of mothers and fathers of children with ASD in non-Western contexts. Providing an example of a mixed-methods design, this presentation will illustrate a doctoral study. The study's objective is to conduct an embedded design, mixed-method analysis using grounded theory of parents and professionals to better understand parents' (mothers and fathers) experiences, stress, well-being and resilience in the Malaysian cultural context. Integrating and blending the approaches together in a symphony allows for deeper analysis and theory development, while allowing rich cultural data to be shared in research areas where limited previous information is present. Greater research attention is recommended to focus upon ASD in developing countries, more rural regions, Aboriginal communities, as well as in marginalized or vulnerable populations. Revealing the family system, culture, and contextual processes can provide rich clinical implications for providing better support before, during and after the diagnostic process as well as during treatment. Deepening the knowledge base with mixed-methods findings has important implications for professionals and researchers to develop more meaningful, culturally-tailored, and evidenced-based interventions.

Kartini Ilias - kili1@student.monash.edu

Karen Golden - karen.golden@monash.edu

Presenting Author: JUKES, Stacey; TENNANT, Michelle; MORRIS, Jess

Title: **Can handwriting movements predict social communicative functioning? A kinematic analysis of school children's handwriting**

Affiliation: School of Psychology, Deakin University

Co Authors: Nicci Grace, Nicole Papadopoulos, Beth Johnson, Nicole Rinehart, Peter Enticott

A significant number of studies have demonstrated that motor impairment is highly prevalent in children with Autism Spectrum Disorder (ASD), and although it is not recognised as a core feature of ASD, recent population-based studies indicate that poor motor skills may precede, correlate with, or exacerbate social communicative difficulties. Large population-based studies of children with ASD and typically developing (TD) children have shown support for the hypothesis that reciprocal social ability is not just present at the extreme ends of impairment, as in clinical disorders, but is continuously distributed in the general population (e. g. Constantino & Todd, 2003). This supports the recent changes to ASD diagnostic criteria in DSM-5 with its shift toward a more dimensional approach and greater focus on symptom severity. However, at present there is limited research examining the links between motor and social functioning of TD children with sub-clinical ASD traits. Handwriting is a complex motor skill that school-aged children with ASD often have difficulty acquiring. Spatial deficits, macrographia (larger letters) poor letter formation and slower speed have been reported, suggestive of difficulties with motor planning and control. The current study aimed to investigate whether 8 to 12 year old TD children with higher levels of sub-clinical ASD traits, as measured by the Social Responsiveness Scale (SRS), demonstrate less pronounced yet similar motor and handwriting impairments reported in children with clinical ASD by using standardised motor assessments and kinematic handwriting analysis. Significant differences are hypothesised to be found in handwriting process measures between participants with high and low SRS scores indicative of levels of social reciprocal behaviour. Additionally, handwriting spacing, letter and word size, and "in-air" movement (time spent off the writing surface) measures are hypothesised to be significant predictors of social communicative functioning. Implications of this preliminary study could suggest that kinematic handwriting analysis may be a useful tool not only in clinical settings, but

also in schools to augment traditional movement assessments and provide further information on children's neuromotor functioning.

Stacey Jukes - sjuka@deakin.edu.au

Presenting Author: JURGENS, Anneke

Title: Procedural integrity and social validity of the Picture Exchange Communication System (PECS) implemented by parents in naturalistic settings

Affiliation: Monash University

Co Authors: Dennis Moore, Angelika Anderson

While recent reviews of the Picture Exchange Communication System (PECS) research have provided support for the efficacy of PECS, they have also identified the need for future research to examine the long term maintenance of skills acquired through PECS training, as well as the social validity and procedural integrity of the intervention as used in practice. The aim of the present study was to examine the social validity and procedural integrity of parent-implemented PECS in naturalistic settings, utilizing three approaches: an analysis of YouTube videos, an internet survey, and a long term follow up. Results demonstrated a high rate of procedural errors in parent's implementation of PECS with their children in naturalistic settings and a lack of the long-term maintenance of skills acquired through PECS training, despite parents indicating that they believe PECS to be an effective and acceptable intervention and reasonably straightforward to implement. Implications of these results for parents and their children with communication impairments, as well as recommendations of revision to the current PECS manual and directions for future research, are discussed.

Anneke Jurgens - annekejurgens@yahoo.com.au

Presenting Author: KAM, Rebecca

Title: The impacts of bilingual exposure on cognitive functioning of children with Autism Spectrum Disorders

Affiliation: Olga Tennison Autism Research Centre, La Trobe University,

Co Authors: Kristelle Hudry, Lisa Rumney, Nicole Porter, Suzana Cunha

Multilingualism is a growing phenomenon worldwide, with research reporting more than half of the world's population to be bilingual. In Australia, reports have indicated about 19% of the Australian population speaks a language other than English. Recent interviews involving bilingual families who have children with Autism Spectrum Disorders (ASD) have indicated that professionals often discourage dual language exposure for young children with ASD. These professionals appear to make such recommendations on the grounds that bilingual environments would be 'confusing' and detrimental to learning and development of these young children. Only recently has there been emerging research investigating the impacts of dual-language environments on young children with ASD, but these studies have predominately focused on the impacts on children's language abilities only. Given research shows that impairments in ASD are not restricted to domain of language and communication but also present in non-verbal cognitive abilities, this study examined whether the impacts of bilingual exposure on young children with ASD would be detrimental on their cognitive functioning. 20 monolingual, English-only speaking parents and 20 bilingual parents with English as non-native language were asked to complete standardised measures of executive functioning, language and communication, and adaptive skills of their young child with ASD. These parent-report questionnaires data are currently being analysed. It is predicted that bilingual exposure would not be detrimental to the general cognitive functioning of young children with ASD, and would confer an advantage in the domain of executive functioning.

Rebecca Kam - rykam@students.latrobe.edu.au

Presenting Author: KLOPPER, Felicity^{1,2}

Title: Diagnosing Autism Spectrum Disorder and Characterizing Current Behaviour in High-functioning Children Using Two Standardised Assessment Tools: The ADI-R and ADOS-2

Affiliation: ¹School of Psychological Sciences, Monash University, Australia

²Melbourne Neuropsychiatry Centre, Department of Psychiatry, The University of Melbourne & Melbourne Health, Melbourne, Australia

³Centre for Neural Engineering, The University of Melbourne,

⁴Department of Psychiatry, The University of Melbourne

Co Authors: Stan Skafidas^{3,4}, Christos Pantelis^{2,4}, & Renee Testa^{1,2}

Background The Autism Diagnostic Interview-Revised (ADI-R) and Autism Diagnostic Observation Schedule (ADOS-2) are standardised measures used to aid Autism Spectrum Disorder (ASD) diagnosis. To inform tool selection in clinical practice we need to understand the degree of consistency in diagnostic classification according to each measure, as well as how they overlap and differ in characterizing current functioning.

Aim This study examined the consistency of diagnostic classifications of the ADI-R and ADOS-2 in high-functioning children with ASD, and examined the relationship between the tools in measuring current functioning across key domains central to diagnosis.

Method The sample contained 57 children (5-14 years) with ASD but without intellectual disability. Classifications according to the diagnostic algorithms of each measure were compared. Relationships between Social Interaction, Communication, and Restricted Interests and Repetitive Behaviours (RRBI) domain and item scores were explored.

Results There was limited consistency in diagnostic classifications across the measures. Social Interaction and Communication domains correlated significantly. There was no significant relationship between RRBI domain scores. Concordance between severity ratings on RRBI subdomains was limited. Children were more likely to be rated with greater severity of circumscribed interests/preoccupations/repetitive behaviours on the ADI-R compared with the ADOS-2, while the opposite pattern was observed for rituals/compulsions.

Conclusions Classification according to ADI-R and ADOS-2 diagnostic algorithms were inconsistent in this sample of high-functioning children with a clinical diagnosis of ASD. Results revealed potential disparities between the measures in assessing current ASD characteristics. Findings highlight the importance of using child observation as part of a broad assessment accompanied by comprehensive caregiver interview.

Felicity Klopper - felicity.klopper@monash.edu

Presenting Author: LANE, Alison E

Title: Patterns of general behavior as a function of sensory subtype in children with autism

Affiliation: The University of Newcastle

Co Authors: Kelly Tanner

Background: Sensory difficulties affect adaptive behavior and are associated with challenging behaviors in children with autism. We have identified four sensory subtypes in autism that are distinct in severity and modality affected: 1) **Sensory Adaptive:** no clinically significant sensory symptoms; 2) **Taste Smell Sensitive:** extreme scores in Taste/Smell Sensitivity; 3) **Postural Inattentive:** extreme scores in Low Energy/Weak; and 4) **Generalized Sensory Difference:** all sensory domains affected. We hypothesized that patterns of general behavior would vary as a function of sensory subtype classification.

Methods:

Participants: 210 children ages 2-10 with autism

Instruments: Short Sensory Profile (SSP), Child Behavior Checklist (CBCL), Vineland Adaptive Behavior Scales, 2nd ed. (Vineland-II)

Analysis: We used model-based cluster analysis to determine sensory subtype (SSP) and MANOVA to determine differences in key behaviors based on subtype classification.

Results: We observed the following patterns of general behavior in autism when grouped by sensory subtype:

1. **Sensory Adaptive:** fewer challenging behaviors overall
2. **Taste Smell Sensitive:** higher scores on Somatic Complaints ($p=0.001$) but fewer difficulties with Attention
3. **Postural Inattentive:** difficulties with Attention ($p=0.008$) but fewer Somatic Complaints
4. **Generalized Sensory Difference:** higher scores on Somatic Complaints; marginally higher scores in Attention ($p=.083$)

Conclusion: The findings provide initial support for the utility of sensory differences as a mechanism to identify clinically meaningful subgroups in autism that may guide intervention recommendations.

Presenting Author: MAY, Tamara

Title: AusKick for Autism: Determining the feasibility of a football program for children with Autism Spectrum Disorder

Affiliation: Deakin University & Irabina Childhood Autism Service

Co Authors: Delwyne Stephens, Debra Goldfinch, Lisa Barnett, Trina Hinkley, Helen Skouteris, Jane McGillivray, Nicole Rinehart

Background: Children with Autism Spectrum Disorder (ASD) have reduced engagement in sporting activities due in part to the behavioural problems and motor impairments that are inherent in ASD. The Irabina AFL AusKick program for children with ASD was developed to improve engagement of this population with sport/physical activity and their families, particularly fathers, in a supportive and safe environment. This study aimed to determine the program feasibility and whether there was improvement in objectively assessed motor skills and parent perceptions of their child's motor skills following the program.

Method: Fifty children with Pervasive Developmental Disorder or ASD aged from 5-12 years participated in the 11 week program. The program was based on the mainstream AusKick program where children participate in whole group and smaller group activities focusing on improving football skills. Consent from parents to be in the study was obtained for a subset of families. Parents completed ratings of their child's level of motor skill and provided qualitative comments via a questionnaire and telephone interview regarding constraints to, and facilitators of, participation in the program, pre- and post-program. Children completed a subset of tasks from the Test of Gross Motor Development.

Results: Results including changes in motor skills and parent perceptions of motor skills will be reported. Preliminary findings indicate that the program was generally well accepted by families.

Conclusion: The Irabina AusKick program shows promise in increasing participation in sporting activities in children with ASD.

Dr Tamara May - Tamara.may@deakin.edu.au

Presenting Author: MAYA, Jackie

Title: Coping and acceptance of a child's recent ASD diagnosis in parents who are culturally and linguistically diverse

Affiliation: Olga Tennison Autism Research Centre, La Trobe University

Co Authors: Josephine Barbaro, Ashlee Hancock, & Kristelle Hudry

The nature of Autism Spectrum Disorders (ASD) can present overwhelming challenges for parents caring for a child with such a diagnosis, leading to high levels of stress, anxiety and depression. The challenges involved may be heightened for parents who are culturally and linguistically diverse (CALD), as they face additional hardships (e.g., employment difficulties, language barriers, and cultural adaptation; Renzaho, Green, Mellor, & Swinburn, 2011). Coping styles can be indicators for predicting parental mental wellbeing and Hastings et al. (2005) suggest that parents can only successfully adapt and adjust to a child's ASD diagnosis if they have an adaptive coping style. However, little is yet known about coping and acceptance of a recent ASD diagnosis in CALD parents. Using a prospective between groups design, we evaluate coping and acceptance of a recent ASD diagnosis in a very young child (12 to 36 months) between CALD and non-CALD parents who have had their child assessed at La Trobe University's Early Assessment Clinic (EAC) for ASD. Parents complete the Ethnicity and Cultural Identity questionnaire (Yee & Ling, 2000), the Cope Scale (Carver, Sheier, & Weintraub, 1989), the Reaction to Diagnosis Questionnaire (based on the Reaction to Diagnosis interview; Marvin & Pianta, 1993) and the Depression, Anxiety, Stress Scale (Lovibond & Lovibond, 1995) approximately 3 years or less after their EAC appointment. Data analysis is currently underway. Considering that CALD parents present unique characteristics and challenges, we expect this group may also present unique coping styles, which need to be understood in order to provide these parents with adequate support programs.

Jackie Maya - jmaya@students.latrobe.edu.au

Presenting Author: MILLS, Caroline

Title: Using the Perceive, Recall, Plan, Perform (PRPP) system of task analysis to measure information processing in children with ASD and intellectual disabilities in the classroom

Affiliation: Autism Spectrum Australia,
The University of Sydney

Co Authors: Christine Chapparo

Background: Children with ASD and ID experience differences in information processing resulting in difficulties organising and motivating themselves for classroom task performance. The purpose of this study was to describe task performance in children with ASD and ID from a cognitive strategy application perspective in order to develop effective classroom instruction techniques. The Perceive, Recall, Plan, Perform (PRPP) (Chapparo & Ranka, 2011) system of task analysis is a criterion referenced cognitive task analysis which enables measurement of cognitive strategies as they are applied to perform a task in context. The conceptual framework for PRPP assumes information used to generate task performance falls into four key areas, attention and perception (perceive), memory (recall), planning (plan) and task execution (perform).

Method: A descriptive cross sectional study of cognitive strategy application identified strengths and weaknesses during classroom tasks. Five children with ASD and ID were videotaped performing tasks within a special school over one term. Average scores generated by the PRPP Stage Two Analysis were computed from multiple data points.

Discussion: Data showed a consistent pattern of strengths and difficulties across the five children. Processing strengths were evident in sensory discriminating and recalling facts. Sensory monitoring, programming responses and evaluating actions were areas of difficulty. Results may be used to guide future design of cueing and prompting systems for children with ASD and ID.

Conclusion: This pilot study suggests that the PRPP may be a suitable measure for exploring cognitive strategy application and task performance in a classroom setting for this population.

Caroline Mills - cmills@autismspectrum.org.au

Presenting Author: MOZOLIC-STANTON, Beth

Title: Right kids, right service, right time: developmental surveillance for Autism Spectrum Disorder (ASD) in early childhood education settings

Affiliation: Southern Cross University, Queensland

Co Authors: Michelle Donnelly, Josephine Barbaro, Jacqui Yoxall

Children who are at risk for ASD would benefit from early identification and access to early intervention, as this takes advantage of children's early brain plasticity. ASD can be reliably detected in children as young as 18 months of age, although developmental surveillance practices are inconsistent in the community and many developmentally vulnerable children are not identified until late preschool or school age. Childcare settings present an ideal opportunity for ongoing developmental surveillance and appropriate, timely referral of young children to allied health supports. This study aims to implement and evaluate a system for identifying young children who may be "at risk" for ASD in early childhood education and care centres by comparing the effectiveness of current practices of developmental surveillance with the Social Attention and Communication Surveillance (SACS; Barbaro and Dissanayake, 2010). **Method:** Early childhood educators from regional Australian communities will receive training on the early identification of ASD and the SACS which will be implemented every 6 months for 18 months in their classrooms. Any child identified as being "at risk" by key items will be referred for comprehensive developmental assessment and early intervention services if warranted. **Results:** Specificity, sensitivity, positive and negative predictive values of surveillance tools will be determined and qualitative feedback from educators and parents will provide insight into their perspectives on the benefits and challenges of developmental surveillance. **Conclusion:** Early childhood education professionals can be partners in the process of early identification and referral of young children who are at risk for ASD when provided with training and validated tools. Through specific early detection practices, families of children who are at risk for autism or other developmental challenges may be able to access specialised support, intervention and resources in a timely manner to maximize developmental potential.

Beth Mozolic-Staunton - beth.staunton@scu.edu.au

Presenting Author: NICOLLET, Cindy

Title: **The efficacy of psychological interventions for adolescents and adults with Autism Spectrum Disorder (ASD) to reduce anxiety: A Systematic Review**

Affiliation: Queensland Centre for Intellectual and Developmental Disability (QCIDD), The University of Queensland (UQ)

Co Authors: Nicholas Lennox, Kate van Dooren.

Objective: To review studies involving the treatment of anxiety in adolescents and adults with Autism Spectrum Disorder (ASD), using psychological interventions, namely Cognitive Behaviour Therapy (CBT). The systematic review will inform doctoral research aiming to develop and implement an online intervention program for older adults (over 40 years of age) with ASD and anxiety. This study forms part of a wider initiative to create an online resource hub for health professionals and people with ASD to improve delivery and access to health care.

Methods: The systematic search of electronic databases and reference lists yielded 11 studies. Each study that met pre-determined inclusion criteria was evaluated in relation to: (1) participants, (2) intervention type and procedure, (3) dependent variables and (4) results of intervention.

Results: To establish the efficacy of interventions, the analysis will focus on changes in anxiety rating pre- and post-intervention. During this presentation, the results of the data analysis will be presented. Data analysis will be used to inform the later development of the online intervention program.

Conclusions: Little is known about how to improve the health and well-being of adults with ASD. The results of the systematic review will synthesis much needed evidence to inform an intervention to improve the health and well-being of Australian adults with ASD.

Ms Cindy Nicollet - c.nicollet@uq.edu.au

Presenting Author: NUTTLING, Geoffrey

Title: **Emotional reactivity and expressivity in ASD: a case study.**

Affiliation: University of Divinity [Australia]

Co Authors:

Background: 'Howard's retrospective Asperger syndrome diagnosis at age 67. Evidence for this included a set of school reports (both extensive and intensive) from age 12 to 18. Pathology: from age 33 to late forties, a phase of bi-polar comorbidity. Social: a thirty-year first marriage, with two children and four grandchildren; from age 60, an ongoing second marriage. Employment: early career as musicologist; ten years part-time as Rare Book cataloguer; reskilled in his early fifties for an ongoing final career in psychiatric chaplaincy and the philosophy of mental health.

Methods: Autoethnographical analysis (under doctoral thesis disciplines) of Howard's history, proceeding from the postulate that 'what we are as persons is precisely our relationships'. Evidence: his (corroborated) early memories of being bullied; autobiographical drafts from age 48; his publications record over forty-five years; and later-years journaling.

Results: A history, from the cradle, of behaviour either actively oppositional or withdrawing from emotional pressures of individual and of groups. In contrast, fruitful open-ness to receive from persons—male or female—who are primarily 'factual' and emotionally unpressuring. Undergraduate university experience: 'Asperger heaven'. Later-life 'retreat' experiences as live-in guest of a contemplative monastery facilitated a transformation in open-ness to others, no longer averting gaze, but glad to meet friend or stranger individually in their joy or pain. Increasing ease with emotional expressivity in group settings.

Conclusion: Diagnosis is treatment. For such 'ASD' persons as Howard, what is most most health-giving and life-giving is glad acceptance, without label, of their fellow-humanity.

Geoffrey Nutting - geoff@mmnet.com.au

Presenting Author: RABBA, Stacey^{1,2}

Title: The development and efficacy of a Family Clinic for parents following a child's diagnosis of Autism Spectrum Disorder (ASD)

Affiliation: ¹Olga Tennison Autism Research Centre, La Trobe University
²Cooperative Research Centre for Living with Autism Spectrum Disorders (Autism CRC)

Co Authors: Cheryl Dissanayake^{1,2} & Josephine Barbaro^{1,2}

Background: Children with ASD are being diagnosed more than ever before. Unfortunately, the diagnostic process is distressing and difficult to understand for families. The objective in the proposed project is to develop and test the efficacy of a Family Support Package (FSP) to support parents soon after the diagnostic process. The specific aims include: 1) the development of a package that comprises parental education/information in the form of a post-diagnostic kit, and a Family Clinic (FC); 2) to investigate whether access to the FC improves parental well-being.

Method: The first study phase will use focus groups with parents to inform the development of the FSP. Audio recordings will be transcribed with qualitative analyses conducted to draw key themes. The post-diagnostic kit and FC will be designed based on these results and the literature. A randomised control design will be utilised in Phase 2 to compare outcomes of 50 families allocated to the FC soon after diagnosis to 50 families not allocated to the clinic condition. Recruitment will be from the Social Attention and Communication Surveillance-Revised study.

Measures: All families will complete online questionnaires at pre-intervention, post-intervention, and follow-up. Questionnaires will include: Reaction to Diagnosis Questionnaire; Parenting Stress Index-Short Form; Depression Anxiety Stress Scale; Sense of Family Coherence Scale; Parenting Sense of Competence Scale; Family Crisis Oriented Personal Evaluations Scale; Family Quality of Life Survey, and Family Support Scale.

Analysis: Efficacy of the FC will be evaluated using 2 (Group) x 3 (Time) ANOVAs/MANOVAs to ascertain whether it reduces parental stress, and increases parental wellbeing, resolution with diagnosis, family sense of coherence, and parenting satisfaction and self-efficacy.

Stacey Rabba - asrabba@gmail.com

Presenting Author: RENE, Alexis^{1,6},

Title: The Australian Autism Biobank

Affiliation: Telethon Kids Institute, University of Western Australia (UWA)¹;
Olga Tennison Autism Research Center (OTARC), La Trobe University²;
University of NSW (UNSW)³,
Mater Research Institute (MRI-UQ)⁴,
Queensland Brain Institute (QBI), The University of Queensland⁵;
Cooperative Research Centre for Living with Autism Spectrum Disorders (Autism CRC) Queensland⁶.

Co Authors: Cheryl Dissanayake^{2,6}, Valsamma Eapen^{3,6}, Helen Heussler^{4,6}, Charles Claudianos^{5,6},
Melanie Muniandy^{2,6}, Rachael Grove^{3,6}, Andrew Whitehouse^{1,6}

The exact aetiology of ASD remains unknown; however current understanding is that a combination of gene sets interacting with other environmental or biochemical factors may cause varying subtypes of ASD. One of the limiting factors in research seeking to understand the causes of ASD is the availability of detailed phenotypic and genotypic data on a large sample of affected families. The Australian Autism Biobank (developed, funded and governed by Autism CRC) aims to address this research gap by creating the largest repository of biological/behavioural data from families and children with ASD in Australia and the world and one of the largest ASD biobanks in the world.

Phenotypic and genotypic data will be collected on children (ages 2-17) diagnosed with ASD and their biological parents (n=1200 families). This will occur across Australia through the collaboration of research sites in four states (WA, NSW, VIC, and QLD).

Genetic samples obtained from participants will be transported from each research site to the Queensland Brain Institute for DNA and plasma extraction and to the Wesley Research Institute Tissue Bank for long-term storage.

This talk will describe the principles underpinning the Autism Biobank, the methodology and the protocol for data collection, storage and accessibility.

The creation of one of the first biological repositories of information within Australia from parents and children with ASD is likely to drive significant advances in understanding ASD. It is with this greater understanding that researchers will be able to work on an earlier and more accurate diagnosis of autism as early as possible.

Presenting Author: RUSSO, Adrian²

Title: A mouse model of ASD with comorbid anxiety

Affiliation:

1. Department of Genetics/School of Molecular Science, La Trobe University
2. School of Psychological Science, La Trobe University
3. Department of Zoology, School of Life Sciences, La Trobe University
4. Olga Tennison Autism Research Centre (OTARC), School of Psychological Science, La Trobe University
5. Department of Integrative Physiology, University of Colorado Boulder, Boulder, CO, USA

Co Authors: Amanda Richdale⁴, Cheryl Dissanayake⁴, DJohn Lesku³, Stephen Kent², W. Gregory Somers¹, Christopher Lowry⁵, Matthew W. Hale²

Autism Spectrum Disorder (ASD) is often comorbid with anxiety, however the genetic and neurobiological factors underlying anxiety in ASD are not well understood. The genes that code for serotonergic systems are prime candidates for the development of animal models of ASD with comorbid anxiety. Serotonin is known to control a number of physiological and behavioural states, including social and emotional behaviour and sleep wake cycles; therefore dysregulation of this one neurotransmitter system can impact a number of the core and comorbid behavioural deficits in ASD. Importantly, a common inbred strain of mice, the BALB/c, carries a mutation in the *tph2* gene, which codes for tryptophan hydroxylase, the rate limiting enzyme in the biosynthesis of serotonin. As a consequence, BALB/c mice show a decrease in *tph2* enzyme activity and decreased brain serotonin compared with other inbred strains, such as C57BL/6. In this experiment, male juvenile C57BL/6 (n=12) and BALB/c (n=12) mice were exposed to a social investigation test, as a measure of sociability, and seven days later were exposed to the elevated plus maze (EPM) as a measure of anxiety. Following the EPM, mice were injected with the aromatic amino acid decarboxylase inhibitor, NSD-1015 (100 mg/kg) and their brains were microdissected to determine *tph2* activity. Preliminary results indicate that BALB/c mice show increased anxiety-like behaviour and decreased sociability. Furthermore a strong positive correlation between anxiety-like behaviour and social deficits was observed. These results provide preliminary support for the BALB/c mouse as a model of ASD with comorbid anxiety.

Adrian Russo - amrusso@students.latrobe.edu.au

Presenting Author: SCOTT, Melissa^{1,2}

Title: Understanding Successful Employment for Adults with High Functioning Autism/Asperger's Syndrome

Affiliation:

- ¹Curtin University
- ²Cooperative Research Centre for Living with Autism Spectrum Disorders (Autism CRC).

Co Authors: Andrew Jacobs^{1,2}, Sonya Girdler^{1,2}, Marita Falkmer^{1,2}, Torbjorn Falkmer^{1,2}

Background: Research has shown that very few adults with Autism Spectrum Disorder (ASD), particularly those without intellectual disability, participate in the open workforce. Many studies have identified the need to develop vocational support programs to enable individuals with ASD to participate in and retain employment. However, there is limited research detailing the impact of workplace environmental factors on employment success and the potential successful employment outcomes that may occur from modifying the environment. Furthermore, for those adults with ASD who enter into competitive employment, many are met with the challenge of reluctant employers. Such employers are concerned with the 'additional' costs required for employee training, continual supervision and environmental adaptations. Currently, no research has examined these concerns, nor explored if there is a worthwhile financial cost-benefit relationship to the employer's business in terms of productivity when employing an adult with ASD.

Objectives: The purpose of this study was to determine key employment success factors from the perspectives of adults with ASD and employers, and to examine the cost-benefit relationship for employing an adult with ASD from the perspective of employers.

Methods: Q methodology was used to reveal the viewpoints from adults with ASD and employers regarding employment success factors. Participants were presented with a Q sort (40-50 statements drawn from the concourses) and sorted the

statements on a sorting grid, which ranges from strongly agree to strongly disagree. The Q sorts were analysed using factor analysis.

Expected results: This study revealed the participants' viewpoints regarding what factors influence successful employment, from both the perspectives of adults with ASD and employers. These results will now assist in informing the development of an ASD specific workplace tool.

Melissa Scott - melissa.scott@curtin.edu.au

Presenting Author: SHINDLER, Anya

Title: Developing a Genotyping Panel for Gastrointestinal Dysfunction in Autism

Affiliation: Cell Biology & Molecular Pathogenesis Laboratory,
Department of Microbiology, La Trobe University

Co Authors: Chee Kai CHAN, Regina BELSKI, & Naomi BISHOP

Autism spectrum disorder (ASD) is a highly heritable neurodevelopmental disorder characterized by a range of social and behavioural symptoms (Gorrindo et al. 2012). Along with these core symptoms, individuals with autism often present with other comorbidities such as gastrointestinal dysfunction (GID). Signs and symptoms of GID may include abdominal pain, reflux, diarrhoea, and/or constipation. Buie et al. (2010) found that between 9 and 91% of autistic patients presented with GID symptoms. The variety of GID symptoms reported in ASD patients, indicate the potential for different subgroups in autistic patients. To identify these subgroups and gain insights into GID etiology, a genotyping approach was utilized.

We developed a single nucleotide panel (SNP) panel with known SNPs for ASD, GID, and immune system dysfunction. These SNPs were then tested using human DNA extracted from buccal cells to determine the profile of each sample. This SNP panel and the data from the sequencing will be presented, to demonstrate the potential for this SNP panel to be used in confirming, diagnosing, and subtyping GID symptoms in ASD patients. These data will also help understand the mechanism underlying GID in ASD.

Dr. Naomi Bishop - N.Bishop@latrobe.edu.au

Presenting Author: SUNG, Min

Title: Omega-3 Fatty Acids in the Management of Autism Spectrum Disorders: Findings from an Open-label Pilot Study in Singapore

Affiliation: Institution of Mental Health, Singapore
Clinical Psychology and Psychotherapy, Department of Psychology, University of Basel, Switzerland.
Child Guidance Clinic, Singapore
National Institute of Education, Nanyang Technological University, Singapore

Co Authors: Yoon Phaik Ooi, Shih-Jen Weng, Jade Jang, Lambert Low, Jacqueline Seah, Sarah Teo, Rebecca P. Ang, Choon Guan Lim, Alvin Liew, MBBS, FAMS, Daniel S. Fung, MBBS²

Autism Spectrum Disorders (ASD) is a neurodevelopmental disorder marked by difficulties in social and emotional communication. There is no known cure and medication to treat ASD is often associated with side effects and often may not improve core symptoms associated with this condition. In this open label study, we examined the efficacy and safety of omega-3 fatty acids supplementation among children with Autism Spectrum Disorders (ASD). A total of 41 children and adolescents with ASD aged 7 to 18 years (Mean age = 11.66, SD = 3.05) participated in the study. Following a 12-week omega-3 fatty acids supplementation, participants showed significant improvements on the core symptoms of ASD, as assessed by the Social Responsiveness Scale, as well as attention problems, as reported by the Child Behaviour Checklist. Additionally, we observed an increase in blood fatty acid profiles which were found to be associated with improvements on the core symptoms of ASD. Baseline serum levels of free fatty acid levels were also predictive of response to omega-3 treatment response. Omega-3 fatty acids supplementation was well-tolerated and did not cause any serious side effects. Our findings lend some preliminary support to the use of omega-3 fatty acids supplementation in addressing ASD. Future randomized controlled trials of omega-3 fatty acids in ASD with blood fatty acids measurements in larger samples with longer duration is warranted.

Presenting Author: ULJAREVIC, Mirko

Title: **Sensory sensitivity and intolerance of uncertainty as correlates of anxiety in mothers of children with autism spectrum disorders (ASD)**

Affiliation: Olga Tennison Autism Research Centre, La Trobe University

Co Authors: Sarah Carrington, Susan Leekam

Background: Previous research has shown that parents of children with autism spectrum disorder (ASD) have high levels of anxiety. This study explored whether parent anxiety is linked to two individual characteristics, first, sensory sensitivity, a trait of heightened sensitivity to stimuli from the environment and second, intolerance of uncertainty, a bias to interpret new or unpredictable events as threatening. Both are known risk factors for the development and maintenance of anxiety in the general population.

Methods: Fifty mothers of children and adolescents with ASD completed questionnaire measures of their children's ASD symptoms, their own anxiety and of their intolerance of uncertainty and sensory sensitivity.

Results: Almost half (46%) of mothers met the cut-off criteria for clinically significant anxiety; these mothers had significantly higher scores of sensory sensitivity and intolerance of uncertainty (IU) when compared with non-anxious mothers. Results indicated that sensory sensitivity provided an intervening factor between intolerance of uncertainty and anxiety.

Conclusion: This is the first study to show that intolerance of uncertainty and sensory sensitivity play a part in the levels of anxiety in mothers of children and adolescents with ASD.

Dr Mirko Uljarević - M.Uljarevic@latrobe.edu.au

Presenting Author: VAN DOOREN, Kate van ^{1,2}

Title: **Resources to assist health professionals to better understand and respond to the health and wellbeing needs of adults with ASD**

Affiliation: Queensland Centre for Intellectual and Developmental Disability (QCIDD),
The University of Queensland (UQ),
Cooperative Research Centre for Living with Autism Spectrum Disorders (Autism CRC), Long Pocket Campus, The University of Queensland.

Co Authors: Nicholas Lennox^{1,2}, Cindy Nicollet^{1,2}

Objective: The aim of this Autism CRC project is to develop an online space that contributes to improved health and wellbeing of adults with ASD. An important aspect of this intervention will include resources that assist health professionals to better understand and respond to the needs of adults with ASD. In this presentation, we describe the first, exploratory phase of our research.

Methods: In Phase 1 of our project, we are undertaking: (i) a scoping review of interventions targeting health professionals working with adults with ASD; (ii) a narrative review of autobiographies written by adults with ASD to investigate how they write about 'health'; (iii) a needs analysis of individuals with ASD, their families, autism organisations and health professionals to determine how interactions with the health system can be improved. Our study will be supported by a research advisory group and co-production with adults with ASD.

Results: Although there is little peer-reviewed evidence for interventions targeting health professionals working with adults with ASD, resources (including videos, fact sheets, and clearinghouses) do exist. In this presentation, we will present resources identified through our scoping review, as well as findings from our narrative review of autobiographies.

Conclusions: Our team is committed to community-based, inclusive and outcome focussed research, which is flexible and responsive to the needs of adults with ASD and the health professionals who support them. We anticipate that this approach will lead to the creation of meaningful and useful tools that contribute to real-world improvements in health and wellbeing for a too-often overlooked group.

Dr Kate van Dooren - k.vandooren@uq.edu.au

Funding for this project provided by Cooperative Research Centre for Living with Autism Spectrum Disorders (Autism CRC).

Presenting Author: WILLIAMS, Sarah¹

Title: Exploring microRNA regulatory systems in autism

Affiliation: 1: Queensland Brain Institute, University of Queensland
2 : Faculdade de Medicina de Ribeirao Preto, Universidade de Sao Paulo, Ribeirao Preto, BRAZIL

Co Authors: Cristino, Alexandre¹; An, Joon-Yong¹; Freitas, Flavia^{1,2}; Claudianos, Charles¹

Autism is a neurodevelopmental disorder with heterogeneous genetic causes. There have been many studies examining protein-coding mutations, but less focus on the influence of microRNA (miRNA) regulation. MicroRNAs are important regulators in a neuronal context, but their biological functions are often poorly understood. This is in part due to their characteristic repression of many specific gene targets, combined with difficulties in reliably predicting those targets. Thus it is difficult to evaluate how mutations discovered in genetic screening studies could affect microRNA-mediated regulation, and then judge whether that effect is relevant to autism aetiology.

This work examines the regulatory context and potential gene interaction of each miRNA as a whole – integrating information about its genomic localisation and expression with properties of its computationally predicted gene targets. Complex network analysis was used to characterise the protein-protein interaction networks of the gene targets of each miRNA, and gene-annotation enrichment calculations assessed relevance to autism.

The molecular systems regulated by miRNAs were characterised in the context of autism in order to establish a framework for the interpretation of miRNA gene and target site mutations associated with this disorder. Our computational approach has identified putative miRNA target networks; and we have begun experimental validation of interactions.

Examining a miRNA together with potential gene targets as an integrated system may help us understand the biological configurative functions of miRNAs, and aid assessment of mutations occurring within that system.

Sarah Williams - sarah.williams4@uqconnect.edu.au

Presenting Author: WONG, Chui Mae

Title: Investigating the implications of applying the new Diagnostic and Statistical Manual of Mental Disorders, Version 5 (DSM-5) criteria for diagnosing autism spectrum disorder (ASD) in a preschool population in Singapore

Affiliation: Department of Child Development, KK Women's and Children's Hospital, Singapore

Co Authors: Hwan Cui Koh

Objectives: This study compared the DSM-IV-TR and DSM-5 diagnostic criteria for diagnosing ASD in a preschool population in Singapore.

Methods: Anonymised diagnostic reports for children who underwent an assessment for ASD from March 2012 to August 2013 were re-evaluated by one of two clinicians with experience in ASD diagnosis, using the DSM-IV-TR and DSM-5 criteria. The clinicians were also blinded to the summary/conclusions of the report.

Results: 206 psychological reports were obtained. Median age at time of diagnosis was 3 years 7 months. Four children who did not meet criteria for a diagnosis of autism originally also did not meet criteria on DSM-5. Of 202 children with ASD, 18 (8.9%) did not meet criteria on DSM-5. In 15 cases, it was because only one restricted, repetitive behaviour (RRB) was reported. In 2 cases, the children had adequate nonverbal communicative behaviours despite meeting other criteria. In the last case, the child had deficits in social communication and interaction but no RRBs and a diagnosis of social communication disorder was likely. Children with autistic disorder were more likely to retain their diagnosis than children with PDD-NOS or Asperger Syndrome.

Conclusions: This is the first study of this kind in our Singapore population. The number of children with ASD who would still be diagnosed with ASD using the DSM-5 criteria is higher than that reported in other studies. The data gathered should aid service providers in planning resources for children who might not meet the new criteria but who still need early intervention.

Chui Mae Wong - chuimae@yahoo.co.uk

Presenting Author: YEO, Rachel

Title: **Community-based support for Australian families with children with newly-diagnosed ASD: An evaluation of service uptake**

Affiliation: Olga Tennison Autism Research Centre, La Trobe University

Co Authors: Ru Cai, Cheryl Dissanayake, Peter Sivey, Kristelle Hudry

Autism Spectrum Disorders (ASD), affecting over 1% of Australian children, are typically diagnosed during the preschool years. Early identification, diagnosis and entry into intervention are targets for improved community practice. Support for parents/carers is also important around the time of diagnosis. However, little research examines sustainable, affordable service delivery for families. We present data from an Australian, community-based service seeking to support parents/carers around the time that ASD is diagnosed in their young children. Available data pertain to uptake and engagement with the service by families across the Australian states and territories from 2009 through 2013, and include characteristics of the various attending family members – target children, siblings, and parents/carers. Preliminary analyses suggest two important trends. First, an increase in the number of families accessing this service is apparent across the years since its inception. Second, the average age of enrolled children with ASD/ASD-like characteristics appears to have decreased slightly, over the years. The service therefore appears to be successfully attracting and engaging families with young children with ASD, and may be increasingly successful in engaging families earlier along the journey toward an ASD diagnosis for their children. We plan also to evaluate and report on variation by state and territory, and by metropolitan vs. regional/rural site. A careful understanding of the operation of this service will elucidate the feasibility and potential effectiveness of delivering sustainable, affordable, community-based models of service delivery for families with young children with newly-diagnosed ASD.

Rachel Yeo - R.Yeo@latrobe.edu.au

Presenting Author: YEO, Siang Lee

Title: **Parents' narratives of interactional features of children with autism spectrum disorder (ASD)**

Affiliation: Macquarie University, Sydney & Universiti Malaya, Kuala Lumpur

Co Authors:

The narrative or storytelling abilities by children with ASD have been extensively studied to explore their cognitive processing, linguistic and pragmatic characteristics (e.g. Capps et al., 2000; Colle et al., 2008; de Villiers, 2011; Barnes & Baron-Cohen, 2012). In recent years, the conversational narratives by families, typically parents, of individuals with ASD (e.g. Tait & Mundia, 2012; Hines, Balandin & Togher, 2012, 2013; Gibson, 2014) have been the focus of a small body of research to investigate their lived experiences and perceptions of autism. This study adopts a similar approach by analysing the narrative of experiences, shared by four parents who each has a child diagnosed with ASD. Guided by a set of questions that centred on the interactional abilities of the children, four sessions of semi structured interviews were conducted. Early findings provided an insight into the children's choices of conversational topics and ways of interacting with family members and strangers. The parents' narratives also included how the children's contextually inappropriate utterances had led to humorous or unexpected encounters. In this regard, narratives from parents of children with ASD could contribute toward the understanding of how their children interact in the home and other social settings. More importantly, such narratives are potentially insightful resources that could shed light on strategies aimed at facilitating more effective and meaningful interactions with these children.

Siang Lee, Yeo - siang-lee.yeo@students.mq.edu.au
