FINAL CONGRESS PROGRAMME

PRE-CONGRESS WORKSHOPS

Pre-Congress Workshop Programme Westin Hotel Wednesday, 05 July 2017		
Venue	**Bartholomew Diaz**	**Vasco Da Gama**
09:00—10:30	Autism Spectrum Disorder in Africa and other low-resource environments: Approaches to aetiology, assessment and intervention *Petrus de Vries*	Executive functioning: A comprehensive guide for clinical practice *Yana Suchy*
10:30—11:00	Tea/Coffee	
11:00—12:30	Autism Spectrum Disorder in Africa and other low-resource environments: Approaches to aetiology, assessment and intervention *Petrus de Vries*	Executive functioning: A comprehensive guide for clinical practice *Yana Suchy*
12:30—13:30	Lunch	
13:30—15:00	DriveWise: Lessons learned from a hospital based driving clinic *Margaret O'Connor*	Scientific advances in mild traumatic brain injury: Lessons learned from sport concussion research *Michael McCrea*
15:00—15:30	Tea/Coffee	
15:30—17:00	DriveWise: Lessons learned from a hospital based driving clinic *Margaret O'Connor*	Scientific advances in mild traumatic brain injury: Lessons learned from sport concussion research *Michael McCrea*

CONGRESS OPENING

Cape Town International Convention Centre Wednesday, 05 July 2017	
18:00—18:30	Opening Ceremony (Auditorium 2)
18:30—19:30	***Presidential Address (Auditorium 2)*** Neuroscience, Memory and the Law *Michael Kopelman*
19:30—20:00	Awards Ceremony (Auditorium 2)
20:00	Welcome Reception (Strelitzia Conservatory)

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THURSDAY, 6 JULY

Programme, CTICC
Thursday, 06 July 2017

Venue	Auditorium 2	1.61-1.62	2.61-2.63	2.64-2.66	Exhibition Hall 4A
Chair	*Anitha Menon*	*Louise Olivier*	*Leigh Schrieff-Elson*	*Sharon Truter*	
08:00—10:00	***Invited Symposium:*** Neuropsychological Challenges Associated with HIV and AIDS	***Paper Presentations:*** Emotional Processes/ Cognitive Neuroscience/ Psychopathology	***Symposium:*** Concussion and Neuropsychological, Behavioural, and Imaging Outcomes among Adolescent and University Rugby Players: Local and International Investigations	***Paper Presentations:*** Child Assessment/ Pediatric Neuropsychology	***Poster Presentations:*** Pediatric Neuropsychology/Acquired Brain Injury Child/Learning Disability and ADHD
	Neurocognitive functioning of HIV positive adults ***Menon AJ*** Neuropsychological performance in the coinfection of HIV and TB ***Hestad KA*** Personality disorder, decision making, neuropsychological functioning and risk behaviors in HIV ***Durvasula R*** Information processing, short-term memory and working memory in HIV+ children: Implications for literacy and numeracy learning ***Kalima K*** Neuropsychological assessment of cognitive functioning: Challenges in the South African context ***Pillay BJ***	Emotional processes in unawareness of illness following stroke ***Besharati S, Fotopoulou A, Jenkinson P, Solms M, Stephanie F, Kopelman M*** Whole brain analyses reveal overlapping and unique neural correlates of empathic processing: The role of verbal fluency ***Taiwo Z, Bezdek M, Light S*** The neuroscience of psychotherapy: A review and proposals for clinical applications ***Mureriwa J*** Neurophenotypes: The language of neuropsychology in the "Omics" era ***Jagaroo V, Bosl W, Santangelo S*** Relationship between temperament and migraine without aura: Results from a South African sample ***Harvey J*** Mu-opioid receptors in ventrolateral prefrontal cortex mediate the relationship between hedonic tone and executive function in MDD ***Light S, Zubieta J, Bielauskas L***	Investigating cognitive and behavioural outcomes of multiple concussions in high school rugby players ***Reid N, Schrieff-Elson L, Jankiewicz M, Thomas K, Wepener L, Figaji A*** Investigating cognitive, emotional and behavioural dysfunction in rugby players with a history of sports-related concussion ***Wepener L, Thomas K, Stephen D, Schrieff-Elson L, Figaji A, Jankiewicz M*** Multimodal neuroimaging and cognitive functioning in concussed and non-concussed athletes ***Williams H, Jones D, Gardner A, Broughton J, Iverson G, Reuben A, Milton F***	Evaluating moral reasoning using multiple morals from the pediatric evaluation of emotions relationships and socialization (PEERS) ***Hearps S, Dooley J, Darby D, Turkstra L, Hearps S, McDonald S, Crawford J, Beauchamp M, Anderson V, Fowler S*** Neurologic soft signs and delayed language development: Performance characteristics of Mexican first-graders ***Salvador-Cruz J, de la Miyar CA, Bautista LG, Vielma EES*** Age effects in neuropsychological measures for typically developing children aged 6 to 11 years ***Ross-McAlpine K, Leathem J, Flett R, Douwes J*** Children with Sickle Cell Disease and sleep-disordered breathing: Impact on executive function and processing speed ***Koelbel M, Kawadler J, Stotesbury H, Balfour P, Kirkham F***	Factors of pediatric concussion from a real life sample ***Crowley J, Vargas S, Bodt B, Abishek R (1)*** Symptom report in pediatric concussion ***Vargas G, Abishek R, Wagner S, Crowley J (2)*** Late childhood goal setting performance in children born very preterm ***Haebich K, Willmott C, Anderson P, Burnett A, Thompson D, Doyle L, Ellis R, Cheong J, Spencer-Smith M (3)*** Preliminary analysis of neurocognitive and psychological impairments of South African children with Tuberous Sclerosis complex ***Page T, Malcolm-Smith S, Berghoff N, Wilmhurst J (4)*** Neuropsychology as a central player in integrated care within a hospital-based system ***Naidoo R (6)*** Multimodal imaging of treatment resistant poor adult readers ***Morris R, Krishnamurthy L, Arrington N, Krishnamurthy V, Schwam D, Greenberg D (8)***
10:00—10:30	Tea/Coffee				

Plenary (Auditorium 2)

Chair: Annelies Cramer

10:30—11:30 ***Vicki Anderson***
Predictors of Neurocognitive Outcomes Following Early Brain Injury

Chair: Elton Bloye

11:30—12:30 ***Andrew Mayes***
The Role of Hippocampus and Other Connected Brain Regions in Memory Functions

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12:30—13:15	Lunch				
Chair	*Ann Edwards*	*Karl Swain*	*Barbara Wilson*	*Frances Hemp*	
13:15—15:15	***Invited Symposium:*** An International Forum on Cross-Cultural Clinical Neuropsychology	***Paper Presentations:*** Medical Disorders/ Alzheimer's Dementia/ Aging/Memory	***Symposium:*** Prolonged Disorders of Consciousness	***Paper Presentations:*** Pediatric Brain Injury/ Autism Spectrum Disorders	***Poster Presentations:*** Adult Assessment
	The Early Learning Outcomes Measure: An instrument for measuring effectiveness of early learning programmes in a culturally diverse context ***Dawes A, Biersteker L, Girdwood E, Snelling M, Tredoux C*** Investigating the development of the NEPSY-II for use in a multicultural pediatric population ***Truter S, Tau P, Thulare SI, Mthembu SA, Kene S, Polden K, Shuttleworth-Edwards AB*** Countrywide IQ test norming in culturally diverse contexts: A review ***Shuttleworth-Edwards AB*** Cross-cultural neuropsychological tests: Current state and challenges ***Fernándes AL*** Life course influences on neuropsychological test performance across cultures ***Manly JJ***	Relationship between self-reported cognitive difficulties, objective test performance and mood in chronic pain ***Baker K, Georgiou-Karistianis N, Giummarra M, Gibson S*** Can Sildenafil enhance cognitive function in patients with Becker muscular dystrophy? ***Petterson K, Rostrup E, Fagerlund B, Jepsen JR, Lindberg U, Witting N, Jorgensen SL, Kruuse C, Vissing J*** Do differences in animal vs. vegetable fluency in cognitively normal subjects affect sensitivity to Alzheimer Disease? ***Loring D, John S, Goldstein F*** Moderate intensity physical activity associates with CSF biomarkers in preclinical Alzheimer's Disease ***Law L, Zetterberg H, Stein J, Johnson S, Carlsson C, Cook D, Asthana S, Edwards D, Einerson J, Okonkwo O, Sager M, Koscik R, Gallagher C, Rol R, Bendlin B, Blennow K, Hermann B, Ryan Dougherty R, Schultz S*** A four-day Western-style dietary intervention causes reductions in hippocampal-dependent learning and memory and interoceptive sensitivity ***Francis HM, Attuquayefio T, Oaten M, Stevenson RJ***	Can patients with a prolonged disorder of consciousness exhibit unilateral spatial neglect? ***Wilson B, Rose A*** Cognitive assessments and multimodal neuroimaging interactions in patients with disorders of consciousness ***Gosseries O, Aubinet C, Cassol H, Wannez S, Laureys S, Murphy L*** Prolonged disorders of consciousness: Continuing dilemmas ***Badwan D*** Effect of circadian rhythm optimization on behavioural and event related potential responses in prolonged disorders of consciousness ***Yelden K, Duport S, Leon J, Farmer S, Kempny A, Leff A, Playford D***	Long term outcomes following mild traumatic brain injury in childhood ***Bernard C, Ponsford J, McKenzie D, McKinlay A, Krieser D*** Integrity of the anterior corpus callosum predicts outcomes of pediatric mild traumatic brain injury ***Yeates K, Bacevice A, Bangert B, Cohen D, Mihalov L, Zumberge N, Taylor G, Bigler E, Hunsaker N*** Motor difficulties in Autism Spectrum Disorder are associated with impaired perception of interactive movement ***Lindor E, Rinehart N, van Boxtel J, Fielding J*** Impaired and preserved processes of time-related information in adults with high-functioning Autism Spectrum Disorder ***Park P, Tsukiura T, Nakamichi K, Nakamura A, Funabiki Y***	An analysis of the court's expectations of neuropsychological evaluations in motor vehicle accident claims as perceived by legal practitioners in South Africa ***Swanepoel H (1)*** Self- and spouse reports of cognitive impairment in cancer patients: Associations with neuropsychological performance and health-related quality of life ***Wu LM, Amidi A, Tanenbaum M, Hall SJ, Bovbjerg K, Diefenbach MA (2)*** A causal modelling approach of the Dutch Wechsler Memory Scale - Fourth Edition (WMS-IV-NL): Exploring memory structure ***Bouman Z, Claassen T, Hendriks M, Van Dijk M (3)*** A preliminary standardisation of the Letter Cancellation Test for military personnel ***Pillay C, Gadd C, Semenya B (4)*** Establishing equivalency between an English and isiXhosa Verbal Learning Test for South Africa ***Scott T, Gouse H, Joska J, Robbins R (5)*** Test-retest reliability and practice effects of the computerized neuropsychological test battery CNS Vital Signs: Evaluation in a Dutch healthy sample ***Van der Linden S, Sitskoorn M, Gehring K, Emons WHM, Rijnen S (6)*** Examinee experience of a brief, tablet-based neuropsychological assessment for isiXhosa-speaking South Africans ***Gouse H, Joska J, Robbins R, Henry M, Scott T (7)*** Differences in tool knowledge between brain injured patients with and without apraxia ***Vingerhoets G, Sack V, Stove J, Vander Stichelen J, Vanrietvelde S, Oostra K, Lannoo E (8)*** Complaints of difficulties handling business affairs is predictive of poorer cognitive performances in a well-educated sample ***Montgomery V, Spencer RJ, Bieliauskas LA (9)*** The Advanced Neuropsychological Diagnostics Infrastructure (ANDI) ***de Vent N, Schmand B, Huizenga H, Muree J, Angelik van Rentergem J (10)***
15:15—15:30	Tea/Coffee				

Birch Lecture (Auditorium 2)

Chair: Michael Kopelman

15:30—16:30	*Donald Stuss* Personalised Medicine: The Role of Neuropsychology

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Programme, CTICC
Thursday, 06 July 2017

Venue	Auditorium 2	1.61-1.62	2.61-2.63	2.64-2.66	Exhibition Hall 4A
Chair	*Ann Watts*	*Menachem Mazabow*	*Leigh Schrieff-Elson*	*Digby Ormond-Brown*	
16:30—18:30	***Invited Symposium (Psychological Society of South Africa):*** Neuropsychology in low resource settings: Challenges and priorities	***Paper Presentations:*** Executive Functions/ Frontal Lobes	***Symposium:*** Severe Pediatric Traumatic Brain Injury in South Africa	***Paper Presentations:*** Cognitive Rehabilitation	***Poster Presentations:*** Acquired Brain Injury Adult/Cognitive Rehabilitation
	Building neuropsychology expertise in Zambia: Priorities and challenges ***Hestad KA, Menon JA*** Assessing traumatic brain injury in rural communities in Limpopo Province, South Africa: Challenges and prospects ***Sodi T*** Neuropsychology in Ghana: A new beginning or a wild goose chase? ***Mate-Kole CC*** The practice of neuropsychology in the South African Public Health Service ***Pillay B***	Split brain: Divided perception but undivided consciousness ***De Haan E, Otten M, Pinto Y, Lamme V*** Is there small-world correspondence between social and brain networks? ***Youm Y, Kim J*** Assessment of executive functions in children and adolescents with ABI using a novel complex multi-tasking computerized task: The Jansari Assessment of Executive Functions (JEF-C©) ***Jansari A*** Sex differences in executive functions of preterm and term preschool children ***O'Meagher S, Anderson P, Norris K, Kemp N*** Monitoring executive functioning during intraoperative monitoring with the Stroop paradigm in 152 glioma patients ***van Zandvoort M, Ruis C, Wajer IH, Broekman M, Seute T, Dijkerman C, Robe P*** Enhanced executive functioning revealed in electrophysiological markers in athletes with and without previous concussions ***Halliday D, Gordon I, Agate FT, Karr J, Garcia-Barrera MA***	Complexities in the neurosurgical management of children following severe traumatic brain injury ***Figaji A, Rohlwink U, Schrieff-Elson L, Thomas K*** Investigating acute predictors of neuropsychological outcomes 12 months after severe pediatric traumatic brain injury ***Wepener L, Rohlwink U, Figaji A, Schrieff-Elson L*** Behavioural and academic outcomes and the specific role of premorbid functioning in a sample of children admitted to the Red Cross War Memorial Children's Hospital following severe traumatic brain injury ***Dollman A, Figaji A, Schrieff-Elson L*** Global and cultural challenges to assessment and rehabilitation outcomes in pediatric traumatic brain injury ***Schrieff-Elson L, Rohlwink U, Thomas K, Figaji A***	Cognitive decline, psychological wellbeing and cerebral function in HIV-infected patients on CART: The Art-Neco Study ***Kessels R, Janssem M*** Barriers to the implementation of an internet-based rehabilitation program in two public healthcare settings ***Ferreira-Correia A, Barberis T, Msimanga L*** A comparison of restorative and compensatory approaches to memory rehabilitation post-stroke (RESTORE): A phase II randomised controlled trial ***Withiel T, Mihaljcic T, Wong D, Cadilhac D, Stolwyk R, Ponsford J, New P*** A modular approach to personalized prospective memory training ***Raskin S, Race M, Aiken E*** Training and transfer effects of working memory updating training are modulated by achievement motivation ***Maes J, Zhao X, Xu Y, Fu J*** Pre-training neuropsychological impairment of children and adolescents with ADHD is unrelated to treatment response after computerized cognitive training ***Minder F, Zuberer A, Brandeis D, Drechsler R***	Concussive Injury in university football players ***Nel K, Govender S (1)*** Developing AppITree: A smartphone reminding App for people with acquired brain injury ***Jamieson M, Brewster S, Mcgee-Lennon M, Cullen B, Evans J (2)*** Spaces for expression: Acquired brain injury in patients in rehabilitation ***Odendaal A, Laidlaw C, Moodley N (3)*** Neuropsychological impairment due to electrocution accident ***Zambrano-Páez D, Salvador-Cruz J (4)*** Dual driving and distractor task: Association with executive functions in older adults ***Miller L, Granros M, Mewborn C, Gogniat M, Robinson T, Jean K (5)*** The relation between somatosensory deficits and left right orientation impairments after stroke: A voxel-based lesion symptom mapping study. ***Dijkerman C, Van Stralen H, Biesbroek M, Kuijf H, Van Gemert M, Sluiter D, Kappelle J, Van Zandvoort M (6)***
19:30	**INS 2017 50th Anniversary Mid-Year Congress Celebration Party (Roof Terrace Room)**				

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FRIDAY, 7 JULY

Programme, CTICC
Friday, 07 July 2017

Venue	Auditorium 2	1.61-1.62	2.61-2.63	2.64-2.66	Exhibition Hall 4A
Chair	*Leigh Schrieff-Elson*	*Trevor Reynolds*	*Skye McDonald*	*Elton Bloye*	
08:00—10:00	***Symposium:*** HIV Infection in Children and Adolescents: Neuropsychological and Demographic Profiles and Assessment	***Paper Presentations:*** Adult Assessment	***Symposium:*** Social Cognition Across the Lifespan: New Advances in Clinical Assessment and Theory	***Paper Presentations:*** Acquired Brain Injury	***Poster Presentations:*** Aging/Dementia (AD)/Dementia (Non-AD) and Mild Cognitive Impairment
	HIV-associated cognitive impairment in perinatally infected children and adolescents: Validation of a quick screening tool ***Phillips N, Thomas K, Stein D, Hoare J, Myer L, Zar H*** HIV-associated cognitive impairment in perinatally infected children and adolescents: Introducing the composite cognitive domain score ***Phillips N, Myer L, Hoare J, Stein D, Thomas K, Zar H*** HIV-related referrals to a local pediatric neuropsychology clinic: A 1-year demographic (including medical, developmental, and academic) and neuropsychological profile ***Mokoena L, Schrieff-Elson L, Donald K, Malcolm-Smith S, Davids N, Walker K***	Use of adaptive behaviour assessment in a South African psycho-legal context ***Douglas G*** A factorial examination of the SIMS subscales in a large patient sample ***Ponds R, Dandachi-FitzGerald B*** Aggregate normative databases in clinical neuropsychology ***Agelink Van Rentergem J, de Vent N, Schmand B, Murre J, Huizenga H*** Alternative facts: The dilemma of adjusting and interpreting test results with a small normative sample in South Africa ***Robbins R, Scott T, Gouse H, Joska J*** On the limits of symptom validity tests ***Ponds R, Dandachi-FitzGerald B***	The awareness of social inference tests: A screening test for social cognition: Comparing Australian and US speakers ***McDonald S, Hazelton J, Padgett C, Allen S, Honan C, Kumfor F, Piguet O*** Employment of a short clinical test to assess social cognition in younger-onset dementias ***Kumfor F, McDonald S, Hodges J, Piguet O*** Impaired alpha responsivity to angry facial expressions is related to volume loss in limbic structures in severe traumatic brain injury ***Rushby J, De Blasio F, Dalton K, Kornfeld E, McDonald S*** Understanding the emotion of others: Evaluating the unique contribution of facial expressivity and subjective emotional experience in the recognition of emotion ***Wearne T, McDonald S*** Evaluating social competency using PEERS with paediatric clinical populations ***McDonald S, Anderson V, Hearps S, Turkstra L, Dooley J, Darby D, Beauchamp M, Hearps S***	Disorders of consciousness: Differences in behaviours recorded on the Wessex Head Injury Matrix between those with traumatic and non-traumatic aetiologies ***Shiel A, Pundole A, Wilson C, Rose A, Zimmerman CNR, Wilson B, Dhamapurkar S*** Parents and PE teacher's knowledge of and attitudes towards sports related concussion in Irish adolescents ***O'Breirne E, Sullivan L, Shiel A*** Persistent post-concussion symptoms following mild traumatic brain injury in adults: Their nature and predictors ***Ponsford J, Downing M, Nguyen S*** Family caregiving of individuals with traumatic brain injury in Botswana ***Mbakile-Mahlanza L, Manderson L, Ponsford J*** Multimodal evaluation of repeated subconcussive blows to the head in contact sport athletes ***Lefebvre G, Chamard E, Theoret H, DeGuise E*** Reliability and sensitivity of dyslexia self-report in college student-athletes: Implications for concussion/mTBI research ***Wiseheart R, Wellington R***	Inconsistency in finger tapping as a domain-specific proxy for CNS integrity in older adults ***Halliday D, MacDonald S, Stawski R (1)*** The relationship between mood disorder and awareness in dementia and bipolar disorder: Clinical and empirical evidence ***Mograbi D, Bertrand E, Silva R, Cheniaux E, Dourado M, Laks J, Morris R (2)*** When does informal caregiving for people with dementia result not only in burden but also in gains? ***Jutten L, Mark R, Sitskoorn M (3)*** Behavioural variant FTD without ALS caused by UBQLN2 P525S mutation ***Leger G, Banks S, Leverenz J, Bekris LM (4)*** Cognitive changes in phenoconverters from asymptomatic to minimally symptomatic FTLD: Preliminary data in the LEFFTDS cohort ***Fields J, Boeve B, Rosen H, Boxer A, Coppola G, Dheel C, Dickerson B, Fong J, Gavrilova R, Ghoshal N, Goldman J, Graff-Radford N, Grossman M, Heuer H, Hsiao J, Huey E, Irwin D, Kantarci K, Karydas A, Knopman D, Kornak D, Kraft J, Kukull W, Kramer J, Mackenzie I, Miller B, Miller M, Phelps C, Rademakers R (5)*** Depressive and anxiety symptoms in Parkinson's Disease with mild cognitive impairment ***Diab S, Postuma R, Gagnon JF (6)*** Patient and partner treatment and outcome preferences in mild cognitive impairment. ***Smith GE, Chandler M, Fields JA, Locke DEC (7)*** Men with experience preparing meals show greater functional independence in mild cognitive impairment ***Berezuk C, Zakzanis K, Ramirez J, Black S (8)*** Differences in caregivers' and patients' perceptions of fitness to drive as a function of type and degree of mild cognitive impairment ***Tan LYR, Hameed S, Ting S, Tay SY (9)*** Impaired meta-awareness of memory deficits evolution in older adults with mild cognitive impairment ***Larouche E, Goulet S, Chouinard AM, Morin-Alain V, Hudon C (10)***
10:00—10:30	Tea/Coffee				

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FRIDAY, 7 JULY

Programme, CTICC
Friday, 07 July 2017

Venue	Auditorium 2	1.61-1.62	2.61-2.63	2.64-2.66	Exhibition Hall 4A
Plenary (Auditorium 2)					
Chair: Yana Suchy					
10:30—11:30	*Jennifer Manly* Mechanisms of Cognitive Disparity in Older Adults: The Role of Race, Culture and Education				
Chair: Ann Watts					
11:30—12:30	*Michael Saling* Diagnostic Approaches in Progressive Disorders: From Subjective Symptomology to Neurobiomarkers				
12:30—13:15	Lunch				
Chair	*Ann Edwards*	*Joachim Mureriwa*	*Barbara Wilson*	*Coco Bernard*	
13:15—15:15	***Invited Symposium (South African Clinical Neuropsychological Association):*** State of the Art Research and Developments in the Field of Sports Concussion	***Paper Presentations:*** Adult Assessment/Cross-Cultural Assessment	***Symposium:*** Getting in Touch with our Roots: How Historical Figures in Neuropsychological Rehabilitation Continue to Influence our Current Clinical Practice	***Symposium (Hosted by INS Student Liaison Committee):*** Novel applications of technology within neuropsychology research and practice	***Poster Presentations:*** Movement Disorders/Cancer/Medical Disorders DMG/Toxin-Related Disorders
	Neurocognitive effects of head and body collisions on players of club level rugby union ***Zoccola D, Shuttleworth-Edwards AB, Radlof SE*** Symptom count, not severity, is the best predictor of concussion recovery in pediatric athletes ***Pardini DA, Pardini JE, Sterling JC, Kisana H, Mattis JM*** Interaction effects reveal cognitive vulnerability in late adolescent rugby playing scholars ***Alexander D, Shuttleworth-Edwards AB*** Return to learn following sport-related concussion ***Pardini JE*** A new validated screening tool for concussion in children ages 5 through 11 ***Lovell MR***	Evaluation of normative data for the computerized neuropsychological battery CNS vital signs: Effects of sociodemographic variables in a Dutch healthy sample ***Rijnen S, van der Linden S, Campman CAM, Meskal I, Gehring K, Sitskoorn M*** Construct validity of a tablet application to assess neurocognition in South Africa ***Robbins R, Joska J, Gouse H, Brown H, Brown H, Ehlers A, Scott T*** Towards a neuropsychology internship program: Evaluation of the neuropsychology service delivery at 1 Military Hospital ***Motswai P, Gadd C*** Neuropsychology training in Africa: An analysis of 126 universities in 30 countries ***Maphisa J*** The state of neuropsychology in South Africa ***Truter S, Mazabow M, Paredes A, Rivera D, Arango-Lasprilla J*** Caregivers' perception of fitness to drive, patients' self-awareness and global cognitive function in cognitive impairment ***Tay SY, Tan LYR, Hameed S, Ting S***	Kurt Goldstein - The father of modern brain injury rehabilitation ***Wilson B*** Oliver Zangwill - The father of British neuropsychology ***Wilson B*** Alexandr Romanov Luria - The grandfather of neuropsychology ***Watts A*** Yehuda Ben-Yishay - The father of holistic rehabilitation ***Evans J***	Development and application of Virtual-Reality technology in neuropsychology ***Schultheis M*** Observations from the cross-disciplinary ApplTree project ***Jamieson M, Cullen B, McGee-Lennon M, Brewster S, Evans J*** Can advances in digital health and E-Health improve assessment, intervention and outcomes for children with brain injury and their families? ***Anderson V***	The effects of alcohol consumption on working memory ***Gopolang S, Marobela S, Mbakile-Mahlanza L (1)*** Childhood adversity and hippocampal volume associated with poorer visuospatial memory in binge drinkers ***Ipser J, Stein D, Gouse H, Freeman C, Joska J (2)*** A comparison of neuropsychological outcomes of pallidal and subthalamic deep brain stimulation for Parkinson's Disease ***Troster A, Abbott A, Ponce F, Hanson K (3)*** The silent companion: Sensed presence in Parkinson's Disease ***Cant R, James A, Devenney G, Harris P, Hastings K, Woods J (4)*** Redefining Gulf War veterans illness ***Krengel M, Yee M, Janulewicz P, Sullivan K (5)*** Psychosocial impact of impulse control disorders in Parkinson's Disease ***James A, Hastings K, Devenney G, Harris P, Cant R, Woods J (6)*** Evaluation of semantic memory in patients with Parkinson's Disease ***Barajas-Toledo D, Rodriguez- Camacho M, Jaimes- Bautista A, Rodriguez-Agudelo Y (7)*** Is APOE4 a risk factor for chemotherapy-induced cognitive impairment and increased immune response in cancer patients undergoing treatment? ***Amidi A, Wu L, Clausen C, Zachariah R, Dements D, Agerbaek M (8)***

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15:15—15:45	Tea/Coffee				
Chair	*John Joska*	*Marilyn Adan*	*Gordon Chelune*	*Leigh Schrieff-Elson*	
15:45—17:45	***Invited Symposium (International Neuropsychiatric Association):*** The Vascular-Alzheimer's Continuum and Unusual Dementias	***Paper Presentations:*** Functional Imaging/ Language and Speech Functions/Learning Disorders	***Symposium:*** Evidence-based Practices in Neuropsychology: Current Status and Future Directions	***Paper Presentations:*** HIV	***Poster Presentation:*** Electropsychology/EEG/Eplilepsy/ Neurostimulation/HIV/ Functional Imaging/Behavioural Neurology/Psychopathology/ Forensic
	An unusual form of vascular-related cognitive impairment: clinical, radiological and neuropathological findings ***Combrinck M*** Two cases of primary progressive aphasia: Neuropsychological assessment in a state hospital's memory clinic ***Thomas K*** Normal pressure hydrocephalus presenting with psychiatric symptoms ***Groenewald L*** HIV dementia: Addressing the burden of disease in South Africa ***Joska J***	Testing the impact of augmented reality on everyday executive task performance using a virtual reality multiple errands test ***Kolovopoulos D, Jamieson M, Williamson J, McGill M, Wilson G, Evans J, Brewster S*** Using functional near infrared spectroscopy to index neural variability in older adults during an executive function task ***Halliday D, Mulligan B, Garrett D, Schmidt S, Garcia-Barrera M, Hundza S, Stawski R, Macdonald S*** Vocal emotion and vocal identity recognition in adult dyslexia ***Castro SL, Mesuita A*** Bilingualism, cognition and language-learning in monolingual and bilingual children in South Africa ***De Sousa D*** Neuropsychological and neuroimaging correlates of inadequate responders to instruction ***Fletcher J, Morris R*** When does a small lag become a delay? Identification of early markers of learning disabilities ***Naidoo R***	Where is the evidence for evidence-based practice? ***Loring D*** Evidence-based test selection and choice of cut-off scores: What is the question? ***Chelune G*** Performance-based measures of functional independence: Relationship to cognitive functions ***Miller L***	Concurrent validity of four screening tests for HIV-associated neurocognitive disorders (HAND): Sensitivity, specificity, and classification accuracy ***Rourke SB, Rachlis A, Gill MJ, Carvalhal A, Atkinson M, Murphy C, Bekele T, Power C, Brunetta J, Robbins R, Sota T, Marcotte T, Cysique L, Arbess G, Kovacs C*** Persistence of neurocognitive impairment and milder forms of HIV-associated neurocognitive disorders (HAND) over 20 years in the HAART era: Evidence from St. Michael's Hospital Neuro HIV Clinical Cohort (Toronto, Canada) ***Rourke SB, Rachlis A, Sota T, Kovacs T, Kovacs C, Bekele T, Nam S, Brunetta J, Cysique L, Gill MJ, Carvalhal A, Arbess G*** Older adults with HIV: Neuropsychological functioning and health-related quality of life ***Motswai P, Cassimjee N, Jedlinski S*** Neurocognitive impairment has a high prevalence in a sub-Saharan HIV-positive population compared to HIV-negative controls; the MoCA-Basic is not an optimal screening tool in this setting ***Arends J, Hakkers C, Beunders A, Ensing M, Barth R, Boelema S, Devillé W, Tempelman H, Coutinho R, Hoepelman A***	Characterizing cognitive alterations in temporal lobe epilepsy using machine learning ***McMillan T, Nair V, Meyerand B, Almane D, Birn R, Hwang G, Binder J, Conant L, Struck A, Mohanty R, Deyoe E, Nencka A, Kawsar F, Maganti R, Raghavan M, Prabhakaran V, Hermann B, Mathis J, Humphries C, Felton E, Rozman M, Zhao G (1)*** Unique prefrontal correlates of empathy subtypes and the role of anhedonia revealed by fMRI ***Light S, Bezdek M, Taiwo Z (2)*** Functional reorganization of the Default Mode Network in ischemic stroke: A prospective study ***Vicentini J, Weiler M, De Campos BM, Valler L, De Almeida SRM, Min I (3)*** Longitudinal neuropsychological outcomes in a patient with Tourette syndrome after deep brain stimulation of the antero-medial globus pallidus interna: A retrospective case review ***Cassimjee N, Van Coller R, Slabbert P, Vaidyanathan J (4)*** The impact of HIV-associated neurocognitive impairment on driving simulator performance in South Africa: A pilot study. ***Gouse H, Henry M, Marcotte T, Thomas K, Joska J, Dreyer A, Robbins R (5)*** Development of inhibitory control and attention processes in healthy preschool children: An ERP study ***Garcia-Anacleto A, Salvador-Cruz J (6)***
17:45—18:30	**INS Business Meeting**				
19:30	**Student Social, Hosted by the INS Student Liaison Committee**				

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SATURDAY, 8 JULY

Programme, CTICC Saturday, 08 July 2017					
Venue	**Auditorium 2**	**1.61-1.62**	**2.61-2.63**	**2.64-2.66**	**Exhibition Hall 4A**
Plenary (Auditorium 2)					
Chair: Jennie Ponsford					
09:00—10:00	***Jonathan Evans*** Rehabilitation of Memory and Executive Functions				
10:00—10:30	Tea/Coffee				
Chair	*Sharon Truter*	*Brian Mallinson*	*Robin Morris*	*Coco Bernard*	
10:30—12:30	***Symposium:*** The Influence on Medical Insurance on Neuropsychology Practice in Three Southern African Countries	***Paper Presentations:*** HIV/Epilepsy	***Symposium:*** Reflections on Ecologically Valid Measurement Techniques for Assessing Planning, Multi-Tasking and/ Organisation in Patients with Dysexecutive Impairment	***Workshop hosted by INS Student Liaison Committee***	***Poster Presentations:*** Executive Functions/ Frontal Lobes/Language and Speech/Memory
	Neuropsychology in Botswana: From registration to medical aid remuneration ***Kgolo T*** To test or not to test - that is the question: A reflection of the neuropsychology dilemma in South Africa. ***Maganlal U*** Exploration of a model to Improve availability of medical Insurance funds for neuropsychological services in Namibia ***Annandale W***	Effect of age and level of education on neurocognitive impairment in HIV positive Zambian adults ***Kabubu N, Lydersen S, Menon JA, Heaton RK, Franklin Jr D, Hestad K*** Sensitivity and specificity of a tablet app to detect neurocognitive impairment among HIV+, isiXhosa-speaking South African adults ***Robbins R, Joska J, Gouse H, Brown H, Ehlers A, Scott T*** Is epilepsy a progressive disease? Evidence from neuroradiological and neuropsychological studies ***Lee G, Park Y*** Aging without a hippocampus: Very long term outcome from temporal lobe surgery for intractable seizures ***Banks S, Jones-Gotman M*** Neuropsychological Assessment Battery (NAB) memory outcomes after temporal resection in epilepsy ***Harris M*** Risk factors for parent reported executive problems in children and youth with epilepsy ***Hessen E***	Individual task processing not multi-tasking is the likely cause of ecological task difficulty in people with multiple-sclerosis ***Morris R, Tierney K, German E, Silber E*** The frontal paradox demonstrated in patients with focal neurosurgical prefrontal lesions using a virtual reality measurement of multi-tasking ***Morris R, Jansari A, Denmark T, Tailor J, Ashkan K*** Assessing multitasking in brain injury and normal ageing using the Hotel Test: A valid test in ten minutes? ***Fish J, Manly T*** ***Discussant: Jonathan Evans***	The art, craft, and science of diagnostic reasoning in clinical neuropsychology: From symptomatology to objective markers ***Saling M***	Using Google Street View to investigate navigation of frequently travelled environments in developmental amnesia ***Herdman K, Ozubko J, Moscovitch M, Rosenbaum RS (1)*** Decision making and its relation to executive functioning in patients with Bipolar Disorder and Major Depressive Disorder ***Oviedo-Rodríguez E, Ramírez-Bermúdez J, Díaz-Victoria AR (2)*** Relationship between executive functions and food craving and their impact on junk food intake in obesity context ***Massicotte E, Jackson P (3)*** Mnemonic strategy training in Korsakoff's amnesia: A controlled pilot study ***Kessels R, Murk S, Walvoort S, Hampstead B (4)*** Development of a short form of the Memory for Intentions Test ***Raskin S, Race M (5)***

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Abstracts Presented at the International Neuropsychological Society Mid-Year Congress 2017

05-08 July 2017
Cape Town, South Africa

WEDNESDAY, 05 JULY 2017

CE Workshop 1. Autism Spectrum Disorder in Africa and other low-resource environments: Approaches to aetiology, assessment and intervention
Presenter: Petrus de Vries
9:00-10:30 and 11:00-12:30

De Vries P. Chambers N, Seris N, Kumm A. Autism Spectrum Disorder in Africa and other low-resource environments: Approaches to aetiology, assessment and intervention

In this interactive, multi-disciplinary workshop we will start with a summary of the state-of-the-art about autism spectrum disorders (ASD) in Sub-Saharan Africa and other low resource environments, before proceeding to discuss current and emerging innovative approaches to aetiology, assessment and intervention for ASD. Specific examples will include new developments in screening and diagnosis of ASD, and adaptation of naturalistic developmental behavioural interventions (NDBI) for parent/carer-mediated treatment. Learning Objectives: By the end of the workshop you should: have an understanding of the African clinical and research context; be able to describe past research on autism spectrum disorder (ASD) in Sub-Saharan Africa, and list some of the key gaps in research knowledge; describe current research on identification and diagnosis in Sub-Saharan Africa (SSA) and list current projects evaluating and developing screening and diagnostic approaches in SSA; describe ASD interventions in SSA and be able to discuss current projects developing and evaluating community-based interventions for ASD in SSA. Correspondence**:** *Petrus de Vries, PhD, Sue Struengmann Professor of Child & Adolescent Psychiatry, and Director of the Centre for Autism Research in Africa and the Adolescent Health Research Unit at the University of Cape. petrus.devries@uct.ac.za*

CE Workshop 2. Executive functioning: A comprehensive guide for clinical practice
Presenter: Yana Suchy
9:00-10:30 and 11:00-12:30

Suchy Y. Executive functioning: A comprehensive guide for clinical practice

This workshop will begin with a conceptual overview of five clinically relevant subdomains of executive functioning, including executive cognitive functions, meta-tasking, response selection/inhibition, initiation/maintenance, and social cognition. For each subdomain, elemental neurocognitive processes, neuroanatomic underpinnings, and relevance to daily life will be detailed. Following a thorough exploration of the executive construct, typical clinical syndromes characterized by discrete patterns of EF dysfunction will be reviewed, highlighting associated etiologies, behavioural and personality changes in daily life, as well as patient presentations during formal evaluations. Lastly, assessment methods for each subdomain of EF will be reviewed, as will assessment challenges and hindrances to ecologically valid interpretation of standardized tests of EF. Clinically useful recommendations for overcoming those challenges and hindrances will be offered, including the introduction of the Contextually Valid Executive Assessment (ConVExA) model and the first steps toward the application of the model in every-day clinical practice. Learning Objectives: This workshop is designed to help you: gain a thorough and clinically useful understanding of the construct of executive functioning (EF) and be able to name the subdomains and elemental processes that comprise the EF construct; describe individual neurobehavioural syndromes characterized by discrete patterns of executive dysfunction, as well as the associated etiologies; list the limitations of typical executive measures, as well as available methods for overcoming those limitations. Correspondence: *Yana Suchy, PhD, University of Utah's Brain Institute and the Utah Center on Aging. yana.suchy@psych.utah.edu*

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CE Workshop 3. DriveWise: Lessons learned from a hospital based driving clinic
Presenter: Margaret O'Connor
13:30-15:00 and 15:30-17:00

O'Connor M. DriveWise: Lessons learned from a hospital based driving clinic

Decisions about driving competence have profound implications for quality of life. Optimal care in this regard requires a thoughtful team approach based on the integration of objective evidence about driving safety and the unique needs of each driver. In this workshop Dr O'Connor will discuss the evolution of DriveWise, an inter-disciplinary hospital based driving assessment programme that has provided road tests for over 800 individuals, many of whom have Alzheimer's disease and related dementias. The DriveWise team includes social work, occupational therapy, adaptive driving instructors and neuropsychology. The specific role of each professional will be highlighted. Dr O'Connor will review relevant research from DriveWise and other assessment programmes demonstrating how age, medical conditions and cognitive impairment impact driving fitness. Ethical, legal and psychosocial issues relevant to decisions about driving fitness will be discussed. Specific cognitive and perceptual factors necessary for safe driving will be identified and tests used to assess these functions will be reviewed. Dr O'Connor will present clinical vignettes to illustrate the complicated nature of the driving assessment process. She will also present clips from educational videos that she produced addressing the driving needs of people with Alzheimer's disease, Parkinson's disease and Asperger's Syndrome. Learning Objectives: This workshop is designed to help you: discuss legal, medical and ethical considerations relevant to driving evaluations; identify neuropsychological skills and brain regions critical for safe driving; describe at least two cognitive tests used in driving assessments; discuss optimal approaches for initiating a discussion about driving with an "at risk" person with mild dementia. Correspondence: *Margaret O'Connor, PhD, moconnor@bidmc.harvard.edu*

CE Workshop 4. Scientific advances in mild traumatic brain injury: Lessons learned from sport concussion research
Presenter: Michael McCrea
13:30-15:00 and 15:30-17:00

McCrea M. Scientific advances in mild traumatic brain injury: Lessons learned from sport concussion research

Applied research over the past 20 years has produced major advances in the basic and clinical science of mild traumatic brain injury (mTBI) and concussion. Modern animal models have provided major breakthroughs in our understanding of the basic pathophysiology of concussive injury. The sports concussion research model has provided an innovative paradigm for the study of mTBI, with numerous methodological advantages over traditional approaches. Findings from the study of sport-related concussion (SRC) have been readily translatable to our understanding of mTBI in civilians, military service members and other populations affected by mTBI. In a clinical setting, both basic and applied science now drive consensus guidelines with respect to diagnosis, treatment and protocols for return to activity after mTBI. Technological advances in functional neuroimaging have created a powerful bridge between the clinical and basic science of mTBI in humans. Collectively, findings from clinical, basic science and functional neuroimaging studies now establish a foundation on which to build integrative theories and testable hypotheses around a comprehensive model of mTBI recovery. This workshop will integrate the current scientific literature on pathophysiology of injury, neurophysiological effects and neuropsychological outcome after mTBI, as well as how the new evidence base can help guide clinicians in the evaluation and management of MTBI. Learning Objectives: review the underlying pathophysiology and neurobiology of mTBI; integrate science that illustrates the true natural history of recovery after mTBI; introduce research on mechanism-based intervention and prognostication; discuss implications of basic and applied research to clinical translation in mTBI. Correspondence: *Michael McCrea, PhD, Brain Injury Research at the Medical College of Wisconsin, 2545 Pasadena Blvd Wauwatosa, WI 53226, United States. mmccrea@mcw.edu*

Presidential Address. Neuroscience, Memory and the Law
Presenter: Michael Kopelman, INS President
18:30-19:30

Kopelman M. Neuroscience, Memory and the Law

Criminal medico-legal practice is fraught with issues, some of which have been little considered by neuropsychologists, in part because the psychological literature has focused heavily upon issues in witness testimony and memory in allegations of child sexual abuse. Some less well-trodden issues will be considered in this address, including (i) the notion of automatism and the science of agency; (ii) amnesia for offences, commonly claimed in specific circumstances; (iii) false memories in the law courts (e.g. false confessions) and their relation to notions of free will; and (iv) the impact of brain pathology upon medico-legal issues, such as fitness to plead and criminal responsibility. Moreover, a burgeoning literature has focused attention upon subtle neurobiological/ neuroimaging anomalies as underlying the tendency to offend. On the other hand, philosophers of law have taken a sceptical view of the probative value of these latter findings. Even in patients with definite neuropsychiatric/ neuropsychological disorders, there are unresolved issues, such as (i) the unsatisfactory clinical definition and status in law of 'automatism'; (ii) the cut-off for frontal lobe pathology/executive dysfunction (or other pathology/ impairment) in issues of criminal responsibility; (iii) the question of exaggeration or simulation; and (iv) how the courts handle people with neuropsychiatric/ neuropsychological disorders. The lecture will be illustrated

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by case-examples from the author's experience. It will argue that there is a risk that a strongly reductionist/biological approach can encourage the neglect of important social factors, and it will also emphasise the difficulty of defining thresholds (cut-offs) for where disease affects responsibility. – a grey area in a world of legal black-and-whites. Correspondence: *Michael Kopelman, PhD, Professor of Neuropsychiatry, King's College London. micheal.kopelman@kcl.ac.uk*

THURSDAY, 06 JULY 2017

Invited Symposium. Neuropsychological Challenges Associated with HIV and AIDS
Chair: Anitha Menon
08:00-10:00

Menon AJ. Neurocognitive functioning of HIV positive adults

This presentation will present results from a study carried out in urban Zambia with 266 HIV+ participants drawn from six urban clinics that routinely offer antiretroviral therapy and 324 HIV- controls. All the HIV positive participants were on ART. A neuropsychology test battery was administered, neurocognitive performance was assessed using demographically corrected T-scores with a mean of 50 (SD = 10). Global Deficit Scores (GDS) were used to assess impairment levels. Participants were impaired if they had a deficit score ≥0.5. The summary T-score results of the NP tests show that the HIV+ participants were more impaired than the HIV controls Furthermore, GDS results show that the HIV+ participants were more impaired compared to the HIV- control. Correspondence: *Anitha Menon, PhD, University of Zambia, Zambia,* anithamenon316@gmail.com

Hestad KA. Neuropsychological performance in the co-infection of HIV and TB

The presentation will concentrate on the work related to collecting norms from healthy Zambians and how these were used in examining the co-infection of TB and HIV on neuropsychological performance. Of 324 HIV+ participants, 241 had HIV only, 45 had extra-pulmonary TB (EPTB), and 38 had pulmonary TB (PTB). Controls were 324 HIV-uninfected, healthy controls from the same setting. All participants were drawn from HIV clinics in and around Lusaka, the capital of Zambia, and underwent comprehensive neuropsychological (NP) testing. NP deficits, assessed by global deficits scores, were prevalent in all HIV-groups, but most so in the PTB group. Thus, all HIV+ groups were more impaired than HIV- controls and co-infection with PTB resulted in more frequent and severe impairment than HIV+ only or HIV+ with EPTB. The findings will be discussed. Correspondence: *Knut Hestad, PhD, Inland Norway University of Applied Sciences, Norway. knut.hestad@hihm.no*

Durvasula R. Personality disorder, decision making, neuropsychological functioning and risk behaviours in HIV

This presentation will examine HIV+ and HIV- adults both with and without personality disorders and examine their neuropsychological functioning and its relation to sexual risk behaviour to determine whether neuropsychological performance in multiple domains varies between the groups as a function of PD and HIV serostatus and whether the relationships between personality disorder and sexual risk are mediated by neuropsychological factors and decision making. Correspondence: *Ramani Durvasula, PhD, California State University, Los Angeles, USA. RDurvas@exchange.calstatela.edu*

Kalima K. Information processing, short-term memory and working memory in HIV+ children: Implications for literacy and numeracy learning

This presentation will examine the correlates of neurocognitive function in HIV+ children with specific focus to the role of information processing, short-term memory and working memory in literacy and numeracy development. The findings suggest no significant contribution of short-term memory in numeracy and literacy development. However, there was a significant contribution of information processing ($p < 0.01$) for numeracy and no contribution for literacy. Working memory had a significant contribution for both literacy and numeracy. These findings may suggest the need to propose information processing and working memory training for HIV+ children in addition to the routine antiretroviral treatment they continue to receive. Correspondence: *Kalima Kalima, Med, Educational Psychology, Sociology and Special Education University of Zambia East Road Campus, Lusaka, 10101 Zambia. kalima.kalima74@gmail.com*

Pillay BJ. Neuropsychological assessment of cognitive functioning: Challenges in the South African context

The evaluation and assessment of cognitive functioning of patients with HIV and AIDS is crucial for appropriate treatment and intervention. Given the myriad psycho-socio-political issues and diversity of the population in South Africa, this presentation addresses some of the challenges practitioners and researchers face when evaluating cognitive functioning and working with people living with AIDS. Correspondence: *Basil Pillay, PhD, University of KwaZulu-Natal, Durban, South Africa. pillayb@ukzn.ac.za*

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Paper Presentations. Emotional Processes/Cognitive Neuroscience/Psychopathology 08:00-10:00

Besharati S, Fotopoulou A, Jenkinson P, Solms M, Stephanie F, Kopelman M. Emotional processes in unawareness of illness following stroke

The possible role of emotion in anosognosia for hemiplegia (i.e. denial of motor deficits contralateral to a brain lesion) has long been debated between psychodynamic and neurocognitive theories. However, there are only a handful of case studies focusing on this topic, and the precise role of emotion in anosognosia for hemiplegia requires empirical investigation. In the present study, we aimed to investigate how negative and positive emotions influence motor awareness in anosognosia. Positive and negative emotions were induced under carefully controlled experimental conditions in right-hemisphere stroke patients with anosognosia for hemiplegia (n = 11) and controls with clinically normal awareness (n = 10). Only the negative, emotion induction condition resulted in a significant improvement of motor awareness in anosognosic patients compared to controls; the positive emotion induction did not. Using lesion overlay and voxel-based lesion-symptom mapping approaches, we investigated the brain lesions associated with performance on the experimental task. We found the insula, putamen and anterior periventricular white matter were associated with less awareness change following the negative emotion induction. This study suggests that motor unawareness and the observed lack of negative emotions about one's disabilities cannot be adequately explained by either purely motivational or neurocognitive accounts. Instead, we propose an integrative account in which insular and striatal lesions result in weak interoceptive and motivational signals. These deficits lead to faulty inferences about the self, involving a difficulty to personalise new sensorimotor information, and an abnormal adherence to premorbid beliefs about the body. Correspondence: *Sahba Besharati, PhD, School of Public Health, Affiliated Institution, Room 219, School of Public Health, York Road, University of the Witwatersrand, South Africa.* sahba@besharati.com

Taiwo Z, Bezdek M, Light S. Whole brain analyses reveal overlapping and unique neural correlates of empathic processing: The role of verbal fluency

The association between performance on verbal fluency tasks, and overlapping and unique neural correlates of empathic happiness and empathic concern (positive and negative vicarious emotion, respectively) was investigated using fMRI. 20 healthy adults (Mage = 22.65, SD = 6.85, 60% female) completed an fMRI-based empathy induction paradigm consisting of empathic concern and empathic happiness eliciting video clips from the television show "Extreme Makeover: Home Edition." Whole brain analyses were completed using AFNI utilizing select video clips that were rated by participants as most evocative of each empathy subtype. Verbal fluency was measured using the Delis Kaplan Executive Function System (DKEFS), which consists of phonemic, semantic and switching conditions. Unique clusters (cluster-corrected $p < 0.001$) were found for empathic happiness video clips in the left dorsal inferior frontal gyrus, left precentral gyrus, left thalamus and right putamen. Nevertheless, these unique activations did not relate to verbal fluency scores. However, greater activity in ventrolateral prefrontal cortex (BA47) during peak empathic happiness ($R \wedge 2 = 32\%$, $p = .009$) and peak empathic concern ($R \wedge 2 = 23\%$, $p = .032$) video clips related to greater semantic fluency score. These findings support prior work suggesting ventrolateral prefrontal cortex is involved in semantic processing; and add to this literature by providing the first indication that successful expression of both empathy subtypes rely on the functioning of this particular frontal executive semantic system. Furthermore, both empathy subtypes involve activation in predicted brain regions, such as the orbitofrontal prefrontal cortex; whereas empathic happiness uniquely recruits subcortical reward circuitry, such as the putamen. Correspondence: *Zinat Taiwo, Graduate Student, Georgia State University, 1015 Washington St. SW #7, Atlanta, United States. ztaiwo1@student.gsu.edu*

Mureriwa J. The neuroscience of psychotherapy: A review and proposals for clinical applications

After a brief review of the literature on the neurobiological effects of psychotherapy, the paper discusses strategies that psychologists can use to apply this knowledge in clinical practice. The five main approaches to psychotherapy have spawned more than a thousand therapeutic techniques (Lebow, 2012). The effectiveness of psychotherapy across schools of thought is attributed to limited sets of common elements, including therapist empathy and unconditional positive regard (Rogers, 1957), learning (Skinner, 1953), the search for meaning (Frankl, 2006), and others. Authors such as Eitken *et al.*, (2005) have proposed that psychotherapy leads to biological changes, just as psychiatric medications do. Salani *et al.* (2013), for example, discovered a link between activity in the right supramarginal gyrus and empathy. Liggan and Kay (1999) proposed parallels between schools of thought in psychology and brain physiology. They proposed that behaviour therapy produces effects in the amygdala, basal ganglia, and hippocampus. Cognitive behaviour therapy affects specific patterns of information processing in the neocortex, especially the frontal cortex. Finally, the psychodynamic therapies produce their effects by affecting complex neurochemistry, incorporating lateralised cerebral hemispheres and subcortical structures. Psychotherapists thus significantly impact neurobiological processes, but they do so largely inadvertently (Mureriwa, 2011). The paper does not introduce new techniques. Rather, it provides a framework for the rational use of current psychotherapy techniques, including psychophysiological interventions, to target and modify neurobiological processes. Correspondence: *Joachim Mureriwa, PhD, Harmacology Association for South African Clinical Psychologists, PO Box 12994, The Tramshed Pretoria, 0126, South Africa. mureriwajf@gmail.com*

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Jagaroo V, Bosl W, Santangelo S. Neurophenotypes: The language of neuropsychology in the "Omics" era

Systems biology is a force that frames the biomedical sciences. It is tuned to a relational understanding of biological systems, especially in tying the genome to the phenome. "Omics," which goes hand-in-hand with systems biology, refers to the approach where biological data are captured in detail and at multiple levels. Multi-scaled data acquisition and comprehensive relational analyses are enabled by bioinformatics. Genomics is the flagship omics discipline – genetics has been transformed by the omics dimension. Brain science is also being transformed by the omics revolution: Connectomics is geared towards detailed neuronal connectivity maps. Transcriptomics is tying gene modules to demarcated neuroanatomic systems. Cognitive phenomics seeks to bring scientifically validated definitions to cognitive constructs by tying them to discrete neural systems. Over the past decade, there has been a growing call for an omics-centred revamping of neuropsychology. And the initiative of Research Domain Criteria (RDoC), led by the US National Institutes of Mental Health – arguing that neural circuits and emergent cognitive phenotypes be the constituent elements for a brain-based nosology of mental disorders, only supports the call. To meaningfully integrate with the omics approach to the brain, neuropsychology must make a monumental shift away from its poorly operationalized descriptions of cognitive behaviour -- notions implicit in traditional neuropsychological tests which amalgamate cognitive processes, and which at best, can be tied to the brain only in gross neuroanatomic terms. Instead, it has to be centred on precisely defined cognitive and neural features – "neurophenotypes" (NPs). These standardized units of analysis offer neuropsychology a much-needed currency in the omics environment. This presentation (a) makes a systematic case for NPs in neuropsychology; (b) raises complications tied to NPs, especially regarding non-gene regulated neural dynamics; (c) discusses the adjustments that neuropsychology must make as it faces the challenge of 21st century systems in neuroscience. Correspondence: *Vinoth Jagaroo, PhD, Boston U. School of Medicine and Emerson College, Dept of Comm. Science & Disorders, 120 Boylston Street, Boston, MA 02116, United States. jagaroo@bu.edu*

Harvey J. Relationship between temperament and migraine without aura: Results from a South African sample

Although migraine is without a determined cause, personality type has emerged as a moderator of the pain experience. In particular, the Harm Avoidance (HA) temperament dimension of Cloninger's Psychobiological Theory of Personality has been related to migraine. This theory proposes four temperament dimensions, each underpinned by a different neurotransmitter system. HA is theoretically underpinned by the serotonergic system. The current study aimed at exploring the temperament profiles of South African migraine sufferers using a quasi-experimental design. Sixty-six participants completed online questionnaires related to migraine (MO) diagnosis and temperament where the latter was assessed using the Tridimensional Personality Questionnaire (TPQ). Participants also provided blood samples to quantify serotonin concentration using enzyme-linked immunosorbent assays. Results indicated a significant association between MO and HA [$t(64) = -2.77$, $p = .01$] with MO participants scoring higher on this temperament dimension, although there was no significant relationship between HA and serotonin. The results therefore support the role of personality in the experience of migraine pain. To counter limitations, further research should be conducted longitudinally using a larger sample and incorporating other variables and possible relationships so as to better assist individuals who suffer from migraines. Correspondence: *Jaqueline Harvey, PhDHSRC, PO Box 110, Kloof, 3640, South Africa. jharvey@hsrc.ac.za*

Light S, Zubieta J, Bielauskas L. Mu-opioid receptors in ventrolateral prefrontal cortex mediate the relationship between hedonic tone and executive function in MDD

Cognitive dysfunction and anhedonia (the reduced ability to experience pleasure) are commonly comorbid symptoms that persist following successful resolution of negative affect in Major Depressive Disorder (MDD). Little is known about whether they share common etiology. PET imaging was used to investigate the relationship between mu-opioid neurotransmission in the ventrolateral prefrontal cortex (VLPFC) (a region involved in executive and emotional processes, e.g. emotion regulation), executive dysfunction (measured via the Wisconsin Card Sorting Test – WCST), and positive emotionality (measured via the NEO personality inventory), in a sample of 39 MDD patients (Mage = 33.4 (SD = 13.22), M HRSD = 20.80 (SD = 4.51), 64% female). More efficient performance on all aspects of the WCST related positively and significantly to positive emotionality as measured by the NEO Personality Inventory (all p's $< .05$). Increased endogenous mu-opioid tone in the VLPFC fully mediated this effect: specifically, VLPFC mu-opioid receptor binding potential remained significant ($p = .049$), and NEO "Positive Emotions" score became a marginal predictor ($p = .065$) of WCST mental set loss percentile rank score (while the overall model remained significant, R ^ 2 = 30%, $p = .015$), when entered into the same regression. These are the first data to directly demonstrate that the endogenous mu-opioid system in the prefrontal cortex relates to positive emotionality and executive functioning in humans with MDD. These results also extend the work of Kent Berridge and colleagues on "liking" by suggesting that mu-opioid functioning in the VLPFC relates to complex, conscious positive emotionality in humans. Correspondence: *Sharee Light, PhD, University of Wisconsin-Madison. slight@gsu.edu*

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Symposium. Concussion and Neuropsychological, Behavioural, and Imaging Outcomes among Adolescent and University Rugby Players: Local and International Investigations
Chair: Leigh Schrieff-Elson
08:00-10:00

Reid N, Jankiewicz M, Schrieff-Elson L, Thomas K, Wepener L, Figaji A. Investigating cognitive and behavioural outcomes of multiple concussions in high school rugby players

Growing evidence suggests that long-term exposure to concussive head injuries, particularly when starting in the adolescent years, results in permanent cognitive and behavioural impairment. One sport in which concussion is frequently reported is rugby union. Current studies of the long-term effects of rugby-related concussion tend to be cross-sectional investigations of adult samples. Few studies focus directly on pediatric samples, and there are no longitudinal studies of the effects of concussion sustained during high school rugby participation on adult brain structure and functional abilities. Such studies are necessary for at least two reasons. First, the adolescent brain differs significantly from the adult brain, and so inferences based on data from adult cross-sectional studies cannot be extrapolated perfectly onto adolescents. Second, a major weakness of adult studies is that they are generally retrospective analyses, with a history of concussion often overlooked and frequently self-reported. Hence, there is a need for longitudinal studies whose entry point precedes the first concussion. Overall, then, a prospective longitudinal study that recruits adolescents into the first wave of data collection is the ideal method for the investigation of the long-term outcomes of concussion in rugby. This paper describes the launch of such a study at the University of Cape Town. We focus particularly on pragmatic, methodological, and ethical considerations that have proven important in the initial implementation of our study. Correspondence: *Nicholas Reid, PhD, Department of Psychology, ACSENT Laboratory, University of Cape Town, South Africa. Nicholas.Reid@alumni.uct.ac.za*

Wepener L, Thomas K, Stephen, Schrieff-Elson L, Figaji A, Jankiewicz M. Investigating cognitive, emotional and behavioural dysfunction in rugby players with a history of sports-related concussion

Given its rising incidence rates and potentially debilitating neurodegenerative outcomes, sports-related concussion has received dramatically increased attention in recent years. Rugby is among the highest-risk contact sports for diagnoses of concussion or mild traumatic brain injury. The aim of this research was to investigate the long term neuropsychological outcomes of repeated concussions in adult rugby players, comparing their data to that of a matched control group with no history of head injuries. The sample (N = 114) was recruited from various rugby and non-contact sports clubs in Cape Town. The relationship between previous concussions and emotional, behavioural and cognitive outcomes was explored using multiple questionnaires measuring depression, anxiety, general health, anger, impulsivity and alcohol usage and the ImPACT neuropsychological test battery, which assesses cognitive functioning. Results indicated no significant differences in emotional, behavioural or cognitive performance between the rugby and control groups and no predictive relationship was found between previous concussive injury and neuropsychological outcomes in any domain. These findings were largely contrary to previous research. It was, however, found that the rugby sample had significantly higher rates of alcohol consumption than the control participants, in keeping with current literature on binge drinking associated with rugby. These findings may suggest that enduring concussive symptoms may better account for poorer long-term outcome while specific emotional, behavioural, and cognitive disturbances dissipate altogether in the acute phase of concussive injury. Correspondence: *Lydia Wepener, MA Neuropsychology, Department of Psychology, University of Cape Town, Rondebosch, Cape Town, South Africa, 7700. lydia.wepener@gmail.com*

Williams H, Jones D, Gardner A, Broughton J, Iverson G, Reuben A, Milton F. Multimodal neuroimaging and cognitive functioning in concussed and non-concussed athletes

Background: Diffusion tensor imaging (DTI) is a proxy measure of white matter microstructure. DTI findings have been correlated with cognitive functioning in mTBI. However, the relationship between subtle changes to cognitive performance and DTI abnormalities remains unclear. Resting state functional magnetic resonance imaging (rs-fMRI) of the default mode network (DMN) in concussed individuals has shown reduced number of connections and strength of connections in some regions of the DMN, but also an increase in the number of connections and strength in other regions of the DMN. Overall, a greater number of concussions have been associated with reduced connectivity in the DMN in some studies. In this study, we collected data from injury records in university rugby players and non-contact sport players. All underwent cognitive testing, DTI, and rs-fMRI imaging. We aimed to address whether multiple sport-related concussions (SRCs) are linked to a) lower performance on cognitive tasks, b) persisting white matter microstructural changes (measured by DTI), and c) weaker strength of functional connectivity (measured by rs-fMRI). We also evaluated if there is a relationship between DTI metrics and decrements in cognitive performance. Participants and methods: Twenty-eight university rugby players and 12 university non-contact sport players (matched for gender, IQ, education) completed cognitive testing of attention, learning and memory, and executive functioning. Retrospective data were collected on history of SRC including number of SRCs (< 3 or = > 3) and severity (presence/duration of loss of consciousness). Participants also completed neuroimaging (DTI and rs-fMRI). Correspondence: *Huw Williams PhD, Centre for Clinical Neuropsychology Research (CCNR), Exeter University. w.h.williams@exeter.ac.uk*

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Paper Presentations. Child Assessment/Pediatric Neuropsychology 08:00-10:00

Hearps S, Dooley J, Darby D, Turkstra L, Hearps S, McDonald S, Crawford J, Beauchamp M, Anderson V, Fowler S. Evaluating moral reasoning using multiple morals from the pediatric evaluation of emotions relationships and socialization (PEERS)

Background: Moral reasoning (MR) is the ability to analyse and evaluate social situations in light of moral criteria to establish judgments about right and wrong and regulate behaviour. Therefore, MR is a vital skill for navigating everyday social interactions. Immature MR can result in poor social decision-making and socially maladaptive behaviour, and may occur as a result of acquired and developmental disruptions to brain function. Multiple Morals (MM), a subtest of the Paediatric Evaluation of Emotions, Relationships and Socialization (PEERS), is a new digital, multiple-choice assessment of MR based on a cognitive-developmental approach. This study examined MR in paediatric clinical populations using MM. Methods: 396 typically developing controls (TDC) and 36 children with clinical diagnoses (Autism Spectrum Disorder [ASD] n = 18; attention deficit/hyperactivity disorder [ADHD] n = 12; Learning Disability [LD] n = 5; anxiety disorder, n = 10) aged 6 – 14 years were assessed using MM and compared on three scores (Moral Decision-making, Moral Maturity and Emotional Score). The effect of diagnosis, age, gender and IQ were explored using generalised estimating equation models, clustered on school socio-economic status. Results: The clinical group performed similarly to the TDCs on all three Multiple Morals outcomes (all $p > 0.05$). Those with a LD had a lower mean moral decision-making score ($p = 0.01$), and those with ASD had lower mean moral maturity ($p = 0.01$) and emotional scores ($p = 0.03$). Conclusions: This study introduces a new multiple-choice measure of MR. Comparisons between clinical and typically developing groups indicate some weaknesses associated with aspects of MR for those diagnosed with ASD and LD. Those with a diagnosis of ADHD or anxiety disorder do not appear to differ from typically developing peers on MR abilities. These results suggest the Multiple Morals may be a useful tool for assessing social competency in children with a variety of clinical disorders. Replication in larger clinical samples is required. Correspondence: *Vicki Anderson, PhD, Child Neuropsychology, Murdoch Children's Research Institute, 50 Flemington Road, Parkville, Victoria, 3052, Australia. vicki.anderson@rch.org.au*

Salvador-Cruz J, de la Miyar CA, Bautista LG, Vielma EES. Neurologic soft signs and delayed language development: Performance characteristics of Mexican first-graders

Objective: To determine whether and how NSS affect early language development in Mexican children. Method - Participants – Thirty-nine first-graders (17 males, 22 females), enrolled in a public school in Mexico City, volunteered. Instruments – 1. ESNBMx (Escala de Signos Neurológicos Blandos-México). Mexican adaptation of the SNS scale. 2. PLON-R-Mx (Prueba de Lenguaje Oral Navarra Revisada) - Navarra's Oral Language Test, Revised, Mexican adaptation (Salvador-Cruz, *et al.* 2016). Evaluates form, content and utilization of oral Spanish through the assessment of five components: phonology, morphology, syntax, semantics and pragmatics. Procedure – Results – Low NSN scores were highly correlated with poor performance on overall language proficiency (r = .568**). Poor auditory comprehension was significantly associated ($p = .001$) with developmental delays in all areas: articulation (r = .457); psychomotor (r = 448**); language use (verbal opposites, categorization, definition and verbal opposites: r = .515**). Pragmatics (absurdities, narrative organization, planning and sequencing) were equally impaired. Conclusions – Little attention has hitherto been paid to the comorbidity of SNS with disrupted language development. This study characterizes the nature of such relationship in undetected Spanish-speaking first graders and highlights the need for an early screening and rehabilitation of SNSs. Findings underscore the need to include language-related signs (e.g., articulation) in the SNSs screening. Correspondence: *Judith Salvador-Cruz, PhD, salvadcj@gmail.com*

Ross-McAlpine K, Leathem J, Flett R, Douwes J. Age effects in neuropsychological measures for typically developing children aged 6 to 11 years

Background: The current study aimed to: 1) Explore the neuropsychological development of the cognitive domains in typical developing children in middle childhood which is an under researched area and 2) Clarify the extent to which results gathered in New Zealand correspond to those of overseas normative groups. Method: The neuropsychological development of typically developing children aged 6 to 11 years was investigated through analysis of 445 neuropsychological assessments conducted as part of a larger study. The NEPSY-II, WISC-IV and TEA-Ch were used to assess attention, memory, motor function, language, information processing speed, executive function and social perception. The assessments were conducted individually in primary schools across four regions in New Zealand. Results: 1) Age effects were found for all measures of cognitive domains with most significant improvement between ages 6 and 9 years. 2) Scaled scores of the NZ sample were within ±4 of a standard deviation standard score of the overseas normative groups for all tests except for finger tapping (NEPSY-II) where NZ children performed one standard deviation higher than the US standardisation group. Conclusion: Age effects were found across all measures of cognitive domains in 445 typically developing New Zealand children. The research implications for neuropsychological development and assessment will be discussed. Correspondence: *Kate Ross-McAlpine, BSc(Hons) Doctor of Clinical Psychology Student, Massey University, 28 Fantail Drive, Maungatapu, Tauranga 3112, New Zealand. kateross.mcalpine@gmail.com*

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Koelbel M, Kawadler J, Stotesbury H, Balfour P, Kirkham F. Children with Sickle Cell Disease and sleep disordered breathing: Impact on executive function and processing speed

Objective: Children experiencing sleep disrupted behaviour are especially vulnerable to daytime sleepiness and loss of academic attainment. Previous data suggests that executive function was worse in older children with sickle cell disease (SCD) and low mean overnight oxygen saturation. This study assesses SDB (e.g. habitual snoring) and resulting hypoxemia as a potential factor contributing to developmental problems in cognition in patients with SCD. Participants and method: We have followed up children and adolescents in the Sleep Asthma cohort who underwent Polysomnography in 2006-2009 and compared the sleep data with subsequent neuropsychological assessment. (e.g., Processing Speed Index (PSI), Executive Functioning, as measured with Delis-Kaplan Tower, and Coding, subtest of PSI requiring neuropsychological processes of sustained and selective attention). Results: Difficulties in executive function and PSI were observed in 28 out of 31 patients with SCD compared to 16 sibling controls. Habitual snoring was significantly associated with decreased PSI, as were shorter sleep duration and bedtime resistance. Shorter sleep duration was also associated with decrease in coding and performance on the Tower test. Daytime sleepiness, as measured with the Epworth Sleepiness Scale, and mean oxygen overnight showed trends for relationships with lower PSI. Caregiver education was a good predictor of worse performance on the Tower test. Conclusion: SDB could contribute to neuropsychological deficits observed in patients with SCD. Sleep disrupted breathing (i.e., habitual snoring and mean oxygen saturation), bedtime routines (i.e., bedtime resistance) and parenting (i.e., caregiver educational level) could be potential mediators improving sleep and cognition in this cohort. Correspondence: *Melanie Koelbel, MSc, UCL Great Ormond Street Institute of Child Health, 15 Grove Court, 99 Larkhall Rise, SW4 6HR, UK. melanie.koelbel.15@ucl.ac.uk*

Poster Presentations. Pediatric Neuropsychology/Acquired Brain Injury Child/Learning Disability and ADHD 08:00-10:00

Crowley J, Vargas S, Bodt B, Abishek R. Factors of pediatric concussion from a real- life sample

Pediatric concussion research has largely been done with adolescent sports injuries, with considerably less in younger groups with non-sports injuries. This paper examines a clinic sample from a pediatric concussion outpatient clinic with an N = 360, an age ranges from 6-18, and a mixed injury etiology (at least 40% non-sports). A retrospective record review to elucidate relationships between demographics, injury factors and aspects of symptom report will be the basis of the content. Symptom report has been shown to be a sensitive measure of recovery, but remains little examined in its downward extension from the adult age population as regards the developmental issues both in brain status and environmental demand (e.g. school). Parent and child reports of symptoms are both examined. Relationships between cognitive assessment scores will also be examined in relation to recovery time. Correlational and between group comparisons have been used in preliminary analyses. Currently, female gender has been found predictive of recovery in the middle school and adolescent groups, as had a divergence in patient and parent agreement as recovery time goes on. In the older children and teens, as well, self-ratings related to computerized cognitive evaluation scores in the older children and teens have been done. In preliminary analyses done to date, in the elementary school sample, gender is not predictive of recovery, and relationships between test scores (paper and pencil testing) are of significance only in measures that tap tasks with sustained attention/working memory and cognitive flexibility. Correspondence: *Jane Crowley PsyD, Psychologist, Neuropsychology, Behavioral Health, Nemours/A.I.duPont Hospital for Children Suite 1D-14 P.O. Box 269 Wilmington, DE 19899. jcrowley@nemours.org*

Vargas G, Abishek R, Wagner S, Crowley J. Symptom report in pediatric concussion

Objective: To describe relationships of demographics, injury factors and symptom report, including patient and parent symptom endorsement and recovery ratings in a pediatric concussion outpatient population. Methods: Correlational analyses and group comparisons of 278 patients from a single year in an outpatient concussion clinic. Sample characteristics: Ages 10-18, 61% male and 52% sports injuries. Administered Post Concussion Scale at each visit confirmed by interview, gathered percent recovery rating from patient and parent, as well as computerized cognitive assessment (ImPACT). Results: Mean symptom duration was 40 days (range: 0-48 weeks). Two thirds of patients reported symptoms longer than 2 weeks, and 7% longer than 90 days. Females had longer symptom durations. Initial symptom report was correlated with longer recoveries. Parent and child recovery ratings were highly correlated, but diverged in later course as patients rated themselves as more recovered. Self recovery ratings correlated with three out of four ImPACT composite scores; parent ratings correlated with only one. Conclusions and recommendations: This study examines symptom report and recovery ratings as correlated with a number of variables in an outpatient clinic setting. Females had longer recoveries. Self-ratings diverged from parent's the further from injury. Self-rating had stronger correlation than parent ratings with cognitive testing scores. The nature of symptom report should be examined as it is a major factor in treatment decisions. Recommendation for future research should include prospective data gathering including control "injury" group. Sufficient group size by age and range increased to allow for specificity of developmental consideration. Correspondence: *Gray Vargas, PhD, Nemours/A.I. duPont Hospital for Children, 3 Julie Lane Newark DE 19711 USA. grayvargas@gmail.com*

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Haebich K, Willmott C, Anderson P, Burnett A, Thompson D, Doyle L, Ellis R, Cheong J, Spencer-Smith M. Late childhood goal setting performance in children born very preterm

Objective: Preterm children demonstrate deficits in executive functions including inhibition, working memory and cognitive flexibility; however, their goal setting abilities (planning, organisation, strategic reasoning) remain unclear. This study compared goal setting abilities between very preterm (VP: < 30 weeks/< 1250g) and term born controls at age 13. Participants and methods: Participants included 146 VP children (mean age 13.21, SD 0.46) and 58 controls (mean age 13.28, SD 0.38). To assess goal setting abilities, participants completed the Delis-Kaplan Executive Function Systems (DKEFS) Tower subtest, Rey Complex Figure (RCF), and the Zoo Maps (ZM) and Six Part Test (6P) from the Behavioural Assessment of the Dysexecutive System for Children (BADS-C). The parent report Behavior Rating Inventory of Executive Function (BRIEF) was also administered, with this study focusing on the Plan/Organize and Organization of Materials subscales. Linear regression was performed to compare groups, with secondary analyses excluding children with IQ < 70 or major neurosensory impairment. Results: The VP group performed more poorly than the controls on the Zoo Map (ZM 1: $p < 0.01$, ZM 2: $p < 0.001$), Tower ($p < 0.01$), and 6P($p < 0.05$) tests. With the exception of the 6P test, the results persisted after excluding children with IQ < 70 or major neurosensory impairment. Consistent with these findings, parents reported more planning difficulties in the VP group ($p < 0.01$). Conclusions: VP status is associated with goal setting difficulties during late childhood, which is likely to have functional consequences academically, socially and vocationally. Correspondence: *Kristina Haebich, DPsych candidate at Monash University (4th year), 699 Drummond Street Carlton North VIC 3054, Australia. kristina.haebich@monash.edu*

Page T, Malcolm-Smith S, Berghoff N, Wilmhurst J. Preliminary analysis of neurocognitive and psychological impairments of South African children with Tuberous Sclerosis Complex

Tuberous Sclerosis Complex (TSC), a multisystem genetic disorder, is associated with a wide spectrum of cognitive and psychological impairments that place a great burden on patients and caregivers as they often result in impaired academic, social and adaptive functioning (Kingswood & de Vries, 2015; Prather & de Vries, 2004). Studies investigating the manifestation of TSC have found it difficult, however, to determine whether TSC is associated with a distinct cognitive and/or psychological phenotype. Furthermore, children with TSC living in low- and middle-income countries (LAMICs), like South Africa, experience additional burdens due to low socio-economic status (SES), high mortality rates and poor access to health care and education, which may exacerbate clinical manifestations (Wilmshurst, Berg, Lagae, Newton, & Cross, 2014). Therefore, the current study seeks to characterise the cognitive and psychological profile of a sample of South African children with TSC (5-17 years) from varying socio-economic and cultural backgrounds and compare it to typically developing children. A preliminary analysis on six children with TSC at Red Cross War Memorial Children's Hospital indicates Full Scale, Verbal Comprehension, Perceptual Reasoning, Working Memory and Processing Speed IQ scores within the extremely low range. Furthermore, parents reported Anxiety, Attention Deficit, and Oppositional Defiant Problems within the Clinical Range. Given these initial findings, further investigation is imperative as it will aid in establishing the cognitive and psychological profile of TSC from a LAMIC context, allow for early detection or management of possible social, academic and personal difficulties and enrich existing global findings. Correspondence: *Teneille Page, MA student, University of Cape Town, Psychology Department, P.D. Hahn Building, Upper Campus, Rondebosch, 7701. teneillepage@gmail.com*

Naidoo R. Neuropsychology as a central player in integrated care within a hospital-based system

Over the past 50 years, the role of neuropsychology has changed from being a niche profession to becoming an integral part of healthcare. With an increasing emphasis on value-based services and whole person healthcare, neuropsychology has an ever-increasing importance within the realm of healthcare. At the same time, the conventional role of a neuropsychologist has expanded from providing evaluation and diagnostic services, to treatment-based modalities geared towards maximizing potential and enhancing cognitive growth. This is particularly important for pediatric healthcare, where the reach expands from fetal health through adulthood. This paper outlines the development of a comprehensive cognitive wellness programme within a midsized pediatric hospital from the perspective of the expanded role of neuropsychology within a healthcare system. The paper will focus specifically on creating seamless service provision across the inpatient, outpatient and community-based settings through extended clinical services for pediatric epilepsy patients. The areas of rapport building, individual and family support across the phases of treatment, neuropsychological assessments, and therapeutic interventions for pediatric populations with intractable epilepsy will be addressed. Correspondence: *Reshma Naidoo, PhD, Director/Neuropsychologist, 2823 Day Avenue, Miami, United States. reshma.naidoo@mch.com*

Morris R, Krishnamurthy L, Arrington N, Krishnamurthy V, Schwam D, Greenberg D. Multimodal imaging of treatment resistant poor adult readers

One in six adults in the United States struggles with basic reading skills. The study used extensive multimodal neuroimaging on 15 adults reading at 3rd-8th grade levels, even after completing 12 years of school, and compared them to 15 average adult readers. Imaging of functional, DTI, and neurochemical integrity focused on LH and RH dorsal and ventral circuits critical for reading. Group differences on DTI measures were related to word reading, fluency, and comprehension. Resting state functional connectivity (rsFC) and MRS concentrations of gamma-amino butyric acid (GABA) covaried with subject's decoding and fluency. On

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rsFC measures, typical readers had many highly connected and reproducible inter-hemispheric connections, whereas poor readers have few inter-hemispheric connections. The expected LH lateralized reading network was identified for typical readers, but a different pattern emerged for the poor readers. Similar results were observed in functional activation studies while reading. MRS results suggested basic neurochemistry differences. As example, level of GABA+/Cr in IFG was positively related to decoding ability. It has been suggested that some poor readers have a right-lateralized reading circuit, which is less efficient than the typical left-lateralized reading network in good readers. These data are in support of this model for poor adult readers who appear to be more treatment resistant. Correspondence: *Robin Morris, PhD, King's College Institute of Psychiatry, Psychology and Neuroscience, PO Box 078 Psychology Institute of Psychiatry, Psychology and Neuroscience De Crespigny Park, London, United Kingdom. Robin.Morris@kcl.ac.uk*

Plenary. Predictors of Neurocognitive Outcomes Following Early Brain Injury
Presenter: Vicki Anderson
10:30-11:30

Anderson V. Predictors of Neurocognitive Outcomes Following Early Brain Injury

The young, healthy brain is highly 'plastic' and able to change in the context of environmental influences. This capacity for change is likely to continue while the brain matures, throughout childhood and into late adolescence. The implications of this capacity for change in the context of brain insult or disruption remains to be determined. While some argue that 'early plasticity' is an advantage and will lead to minimal functional consequences, others claim that the young brain is uniquely susceptible ('early vulnerability') and disruption will lead to permanent and devastating effects. Neither of these views is able to fully explain the pattern of functional difficulties we observe in the context of childhood brain insult. This presentation will consider the theoretical and empirical evidence relevant to the 'plasticity' debate, in the context of both normal and disrupted development. Using research findings from our team and others, the influence of insult-related factors (location, laterality and extent of brain pathology, and presence of epilepsy), child characteristics (age, sex, pre-insult abilities) and environmental factors (SES, family function, parent mental health), on cognitive and behavioural outcomes will be considered. The aims of the presentation are: 1) to provide a description of brain plasticity and vulnerability theories in the context of early brain insult; 2) to examine the influence of age at insult on neurobehavioural outcomes; and 3) to propose predictors of outcome following early brain insult, based on empirical findings. Correspondence*: Vicki Anderson, PhD, Child Neuropsychology, Murdoch Children's Research Institute, 50 Flemington Road, Parkville, Victoria, 3052, Australia. vicki.anderson@rch.org.au*

Plenary. The Role of Hippocampus and Other Connected Brain Regions in Memory Functions
Presenter: Andrew Mayes
11:30-12:30

Mayes A. The role of hippocampus and other connected brain regions in memory functions

Although organic amnesics show dissociable memory deficits, the basis of this functional heterogeneity, particularly of structures in the medial temporal lobe, is still disputed. It is still disputed whether the hippocampus mediates recall memory but not item familiarity memory whereas the neocortical medial temporal lobe (MTL) structures mediate familiarity memory for different kinds of information, inputting recall-related information into the hippocampus. Consistent with the disputed view are the distinct inputs and contrasting cytoarchitectonics of MTL structures, which suggest that the hippocampus binds object-context information into memory using pattern separation to support recall memory. In contrast, the perirhinal cortex receives mainly object information and the parahippocampal cortex mainly context information, which they bind, stressing commonalities, to support familiarity memory. Relatively selective hippocampal lesions are rare and, although impaired cued recall and intact familiarity are often found, other studies have found global deficits. The full explanation for this conflict is still lacking. However, selective damage to structures in the hippocampal circuit (e.g., fornix, mammillary bodies) causes selective recall deficits. Furthermore, in a recent large study of hippocampal patients, recall was impaired and familiarity preserved even when it was as accurate as strong control recollection (with the apparent exception of word familiarity). Our fMRI studies consistently find that even strong/accurate familiarity does not activate the hippocampus for visual stimuli. The apparent exception was again words but further work indicates that the hippocampal effect relates to word abstractness, not familiarity. Data support the hypothesis but issues remain. These and future implications will be discussed. Correspondence: *Andrew Mayes, PhD, University of Manchester, Psychology Department. Andrew.Mayes@manchester.ac.uk*

Invited Symposium. An International Forum on Cross-Cultural Clinical Neuropsychology
Chair: Ann Edwards
13:15-15:15

Dawes A, Biersteker L, Girdwood E, Snelling M, Tredoux C. The Early Learning Outcomes Measure: An instrument for measuring effectiveness of early learning programmes in a culturally diverse context

Objective: Early Childhood Development programme effectiveness is not widely understood in South Africa and is hampered by a lack of suitable measures. The ELOM sought to address this gap. Method: The ELOM consists of 23 direct

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assessment items covering Gross Motor Development, Fine Motor Coordination and Visual Motor Integration, Emergent Numeracy and Mathematics, Cognition and Executive Functioning, Emergent Literacy and Language. Task Orientation is also assessed. Social relations with adults and peers and emotional development are rated by teachers. For age-validation and norming, two stage random sampling (schools in each quintile and learners in Grade R classes) yielded a sample of 1331 children aged 50-69 months in five socio-economic groups and speaking five languages. Item Response Theory techniques were used to establish the reliability, validity and fairness of the ELOM. Results: Psychometry indicated that: ELOM domains are unidimensional and internally consistent; items hold interval scale status and discriminate reliably between more and less able children; items do not discriminate unfairly between children of different socio-economic and language backgrounds; age validity was established; and differential performance by socio-economic group was established. Children in the top 40% of the income distribution performed best on the ELOM while those in the bottom 20% performed worst. Conclusion: The ELOM is a culture fair, standardised instrument that can be administered relatively cheaply by trained non-professionals, and used to assess the effectiveness of early learning programmes in enabling children to reach Early Learning Development Standards for key domains prior to entering Grade R (Kindergarten). Correspondence: *Dawes Andy, PhD, Associate Professor Emeritus, Department of Psychology, University of Cape Town, Cape Town, South Africa. Research Associate in the Department of International Development, University of Oxford, Oxford, United Kingdom. adkinloch1@gmail.com*

Truter S, Tau P, Thulare SI, Mthembu SA, Kene S, Polden K, Shuttleworth-Edwards AB. Investigating the development of the NEPSYII for use in a multicultural pediatric population

Objective: This paper reports on the translation of the NEPSY II test into six South African languages, followed by a preliminary collection of normative data. Method: Five registered psychologists and one neuropsychology Master's student, who were fluent in English and whose first language was either Afrikaans, Xhosa, Zulu, Sepedi, Setswana or Sesotho, translated all but two sub-tests of the NEPSY II. For the norm collection, psychologist volunteers who were familiar with the NEPSY II test, were recruited to test children aged 10-11 years and 15-16 years. The children spoke one of the target languages as a first language, came from disadvantaged backgrounds and had a disadvantaged quality of education. Protocol was that instructions were first given to the children in English, in accordance with the manual and then repeated in the child's home language by a translator. Scoring was done by the examiners and checked by the first author. Results were compared with the US norms in the NEPSY II "Clinical and Interpretive Manual". Results: Data for 29 children in the younger and older age categories were collected (n = 16, and n = 13, respectively). While most subtests were successfully administered, it was found that the children had difficulty with certain sub-tests and that, compared to the US sample, scores were substantially lower for many of the subtests. Conclusions: Many subtests of the NEPSY II hold promise for use with disadvantaged South African children if appropriate norms are used. Further norm studies are needed with larger groups, language differentiation, and additional age ranges. Correspondence: *Truter Sharon, PhD, Honorary Research Associate, Department of Psychology, Rhodes University, Grahamstown, South Africa. sharon@inter-ed.co.za*

Shuttleworth-Edwards AB. Countrywide IQ test norming in culturally diverse contexts: A review

Objective: The objective of this paper is to review the notion of countrywide (population-based) IQ test norming within a multicultural context that has recently been the focus of an article by the first author, invited commentaries, and two editorials (The Clinical Neuropsychologist; *South African Journal of Psychology*). Method: An overview of the relevant issues will be presented and critically discussed, including: 1) the methodological underpinnings of population-based norms versus demographically focused within-group norms; 2) WAIS-III and WAIS-IV population-based norming initiatives within the South African context in relation to South African within-group normative data; 3) core responses reflected in the editorials and commentaries. Results: The population-based South African standardizations are considered flawed for use in clinical settings, due to the mixed-bag data sets that do not stratify for race, language of origin, or quality of education. The within-group norming data for African first language individuals reveal differences of up to 25 IQ points in association with disadvantaged versus advantaged quality of education. There is an overriding consensus from experts of this being a legitimate concern. Conclusions: Burgeoning cultural diversity worldwide calls for an evaluation of adequate assessment practices that comply with standards of the International Test Commission (ITC). It is proposed that the traditional notion of a countrywide unitary norming of an IQ test is an unsatisfactory model for valid assessment practices in any setting where there is extreme socio-cultural and socio-economic diversity. Stratified within-group norms are preferred, serving to reveal rather than obscure cross-cultural disparity in cognitive test performance. Correspondence: *Shuttleworth-Edwards Ann, PhD, Professor, Department of Psychology, Rhodes University, Grahamstown, South Africa. a.edwards@ru.ac.za*

Fernándes AL. Cross-cultural neuropsychological tests: Current state and challenges

Objective: The aim of this presentation is to describe the current state of progress in the cross-cultural neuropsychological testing field, and to propose a framework for the development of tests that can be applied in culturally diverse regions. Method: Information was obtained through literature searches and the author's personal work in the field. Results: Due to factors such as the globalization phenomenon, migrations and the development of neuropsychology worldwide, neuropsychology test development needs to move from a highly Western culture-centred approach to a wider perspective by developing tests that can be easily adapted to different cultural settings. To

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date, several tests that can be used cross-culturally have been developed including the Rowland Universal Dementia Assessment (RUDAS) and the Cognitive Abilities Screening Instrument (CASI). However, most of these efforts have been targeted at dementia screening. Among their limitations are: a) there are few tests for children or adults; b) some of them are too short or too long and, c) in some cases, they are not suitable for poorly educated individuals. The author is currently developing a cross-cultural scale targeted at adult and elderly populations, and it is designed to be appropriate for those with high as well as low levels of education. Its content is intended to be culture-free so it can be easily adapted to different cultural settings. Conclusions: Developing cross-cultural neuropsychological tests is feasible and necessary. There are tools available, but more need to be developed in order to make neuropsychological services available to a wider world population. Correspondence: *Fernándes Alberto, PhD, Head of the Department of Neuropsychology and Psychometrics Catholic University of Córdoba, Argentina; Assistant Professor in the Psychometric Techniques Department, School of Psychology, National University of Córdoba. albertolfernan@gmail.com*

Manly JJ. Life course influences on neuropsychological test performance across cultures

Objective: The objective of this paper is to review racial and ethnic disparities in the prevalence and incidence of cognitive impairment across the life course that may reflect either true differences across groups or differential ability of neuropsychological measures to accurately detect impairment across groups. The focus will be on racial/ethnic groups within the United States and on adult and older adult neuropsychological outcomes. Method: This presentation will: 1) discuss some of the theoretical and psychometric challenges to measurement of cognitive function and cultural neuropsychology; 2) review examples of successful development and application of neuropsychological instruments for use among American adults from different ethnic/racial groups; 3) provide recommendations for future research and for test development given the "lessons learned" from prior research. Results: Neuropsychological test scores reflect true cognitive ability and a complex interaction of life course factors such as educational experience, language proficiency, socioeconomic status, and acculturation. Conclusions: It is of critical importance for both research and clinical pursuits that neuropsychologists understand the capabilities and limitations of their instruments to detect impairment across cultures. It is of equal importance for neuropsychologists to be aware of and to assess the social, environmental, educational, biological, and economic factors, with differential relevance across the life course, that underlie racial/ethnic differences in neuropsychological test performance. Future work should include collaboration and community partnerships by design, so that we continue to shed light on causal pathways from culture to cognition, and improve the utility of cognitive measures. Correspondence: *Jennifer Manly, PhD, Associate Professor of Neuropsychology in Neurology and the Taub Institute for Research on Alzheimer's Disease and the Aging Brain, Division of Cognitive Neuroscience, Department of Neurology, Columbia University, USA. jjm71@cumc.columbia.edu*

Paper Presenta tions. Medical Disorders/Alzheimer's Dementia/Aging/Memory

13:15—15:15

Baker K, Georgiou-Karistianis N, Giummarra M, Gibson S. Relationship between self-reported cognitive difficulties, objective test performance and mood in chronic pain

Background: Persons with chronic pain often report problems with cognitive abilities such as memory or attention since the onset of their pain. There is limited understanding of whether objective performance is consistent with subjective reports, and whether psychological factors contribute to cognitive impacts of pain. Methods: Patients with chronic pain (n=41) completed standardised neuropsychological tests, and self-report measures of cognitive functioning, pain, mood, and sleep, as part of a broader study investigating cognitive performance in pain. Results: Average neuropsychological test performance was subtly below normative means, and up to 20% of the sample scored substantially below expected performance levels relative to age-adjusted norms. There were moderate-to-large associations between objective performance (especially on a measure of complex attention; Trail-Making Test B) and subjective cognitive complaints (e.g. Everyday Memory Questionnaire – Revised), when controlling for age and education level. Poorer test performance was also associated with higher pain intensity and interference, anxiety and catastrophising. Relationships between test performance and self-reported cognitive functioning remained after controlling for anxiety and catastrophising. Conclusions: We report that patients' self-reported cognitive concerns reflected objectively measured performance, and that pain, anxiety and catastrophising were associated with poorer performance. The findings highlight that easy-to-administer tools, such as the Everyday Memory Questionnaire – Revised and the Behavior Rating Inventory of Executive Function – Adult Version, may be useful to capture patients' cognitive concerns in clinical settings and trigger a discussion about how to manage these difficulties. Correspondence*: Katharine Baker, BPsySc, Doctor of Psychology (Clinical Neuropsychology) candidate, Monash University, 12 Cambridge Street, Caulfield North, VIC 3161, Melbourne, Australia. katharine.baker@monash.edu*

Petterson K, Rostrup E, Fagerlund B, Jepsen JR, Lindberg U, Witting N, Jorgensen SL, Kruuse C, Vissing J. Can Sildenafil enhance cognitive function in patients with Becker muscular dystrophy?

Introduction: Patients with Becker muscular dystrophy (BMD) have abnormally low levels of dystrophin in cells. Dystrophin deficiency impairs binding of neuronal nitric oxide synthase to dystrophin, which results in functional ischemia and potential muscle damage. How the lack of dystrophin affects cerebral structure and cognitive function is

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not understood, but low-average intelligence and learning difficulties are associated with BMD. Objective: We investigated whether enhancement of nitric oxide responses in patients with BMD would counteract possible functional ischemia and boost cognitive function. To do this, we used a phosphodiesterase type 5 inhibitor, sildenafil. Methods: This is a randomised placebo-controlled double-blinded cross-over trial of sildenafil in 17 patients with BMD. Patients received four weeks of sildenafil (20mg tablets three times daily) and four weeks of placebo, intersected by a two-week washout period. Cognitive function was assessed before and after each treatment period. Cognitive assessment comprised Rey Complex Figure Test, verbal memory for stories, trail-making, verbal fluency and several subtests from the CANTAB. Results: Sixteen patients completed the study. Sildenafil showed no significant effect on any of the applied cognitive measures compared to placebo. The weighted mean IQ was 101.2 ±10.4 at group level. Conclusions: Sildenafil did not enhance cognitive function in patients with BMD. Our study provides data on cognitive tests in BMD, which have not been performed before. Multicentre studies aiming at testing and improving cognition in addition to muscular function are highly warranted in this rare disease. Correspondence: *Kristoffer Petterson, MSc psych, Department of Neurology, Rigshospitalet, Copenhagen University Hospital, Denmark, Copenhagen University Hospital, Rigshospitalet-Glostrup Department of Neurology, Neuroscience Centre Nordre Ringvej 57 DK-2600 Glostrup, Denmark. kristoffer.petterson@gmail.com*

Loring D, John S, Goldstein F. Do differences in animal vs vegetable fluency in cognitively normal subjects affect sensitivity to Alzheimer disease?

Because degradation of semantic memory is a core feature of Alzheimer disease (AD), assessing generative fluency to category prompts is a component of both clinical and research testing. In clinical application, semantic fluency tasks are considered equivalent, and meta-analytic analyses have included studies using a variety of categories to calculate effect sizes. This study investigated if possible differences exist in the ability to generate the names of animals vs vegetables in cognitively healthy subjects, and if present, how these differences affect sensitivity to AD. Methods: This is a retrospective study using the National Alzheimer's Coordinating Center (NACC) Uniform Data Set. There were 1927 cognitively normal subjects (age = 70.1; SD = 9.6) and 426 patients with clinical AD diagnoses (age = 72.6; SD = 8.9). The two-semantic category generative tasks are animals and vegetables, each 60 second in length. RESULTS: Healthy patients generated significantly more words to the animal prompt (23.9; SD = 14.8) compared to vegetables (18.4; SD = 16.0), resulting in an eta squared = .37, corresponding to a large effect size. AD patients averaged 15.7 (SD = 9.65) animals per 60 seconds, which had an effect size of eta squared =.06 compared to cognitively healthy subjects. AD patients averaged 11.1 (SD = 11.0) vegetables, which had an effect size of eta squared = .04 compared to cognitively healthy subjects. The difference of .02 eta squared units is considered to be a small effect size by convention. Discussion: Despite the large differences in ability to generate the names of animals compared to generating vegetable names, overall magnitude differences in sensitivity to AD are small. Correspondence: *David Loring, PhD, 12 Executive Park Atlanta GA 30329, Emory University, United States. dloring@hsc.utah.edu*

Law L, Zetterberg H, Stein J, Johnson S, Carlsson C, Cook D, Asthana S, Edwards D, Einerson J, Okonkwo O, Sager M, Koscik R, Gallagher C, Rol R, Bendlin B, Blennow K, Hermann B, Dougherty R, Schultz S. Moderate intensity physical activity associates with CSF biomarkers in preclinical Alzheimer's Disease

Background: Alzheimer's disease (AD) pathology is characterized by the presence of amyloid (Aβ) plaques and neurofibrillary tangles. Physical activity (PA) has emerged as a possible modifier of these pathological changes associated with AD. Consequently, the aim of this study was to examine the relationship between objectively-measured PA and cerebrospinal fluid (CSF) levels of Aβ42 and tau in asymptomatic late-middle-aged adults at risk for AD. Methods: Fifty cognitively healthy late-middle-aged adults (age = 63.17 years, 68.0% female) from the Wisconsin Registry for Alzheimer's Prevention participated in this study. They wore an accelerometer (ActiGraph GT3X+) for one week to record free-living PA. Accelerometer data yielded measures of sedentariness and various intensities of PA (i.e., light, moderate, and vigorous, determined according to well-established standards). Participants also underwent lumbar puncture for collection of CSF, from which Aβ42, total tau (t-tau) and phosphorylated tau (p-tau) were immunoassayed. We additionally computed tau-to-Aβ42 ratios. Regression analyses were utilized to examine the association between sedentariness/PA and CSF biomarkers, while adjusting for age, sex, apolipoprotein ε4 status, and interval between CSF collection and accelerometer data. Results: Sedentariness was significantly associated with reduced Aβ42 (p = .023) and increased p-tau/Aβ42 (p = .018). Furthermore, engagement in moderate-intensity PA was significantly associated with higher Aβ42 (p = .002), lower t-tau/Aβ42 (p = .001), and lower p-tau/Aβ42 (p = .002). In contrast, neither light- nor vigorous-intensity PA was significantly associated with any of the biomarkers. The relationship between moderate-intensity PA and CSF biomarkers persisted (p = .009 for Aβ42; p = .008 for t-tau/Aβ42; and p = .003 for p-tau/Aβ42) even after accounting for time spent in light- and vigorous-intensity PA categories. Conclusions: In this cohort of late-middle-aged adults at risk for AD, sedentariness was associated with greater AD pathophysiology, while moderate-intensity PA was associated with a favorable biomarker profile. These findings are consistent with previous studies that suggest a physically active lifestyle may play a protective role against the development of AD. Correspondence: *Lena Law, Undergraduate Research Assistant, 228 Langdon Street, Apt. 9 Madison, WI 53703 USA. lllaw@wisc.edu*

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Francis HM, Attuquayefio T, Oaten M, Stevenson RJ. A four-day Western-style dietary intervention causes reductions in hippocampal-dependent learning and memory and interoceptive sensitivity

In animals, a Western style diet – high in saturated fat and/or added sugar – causes impairments in hippocampal-dependent learning and memory (HDLM). In humans, while there is correlational support for a link between Western-style diet and HDLM, there is as yet no causal data. Here, healthy individuals were randomly assigned to consume either a breakfast high in saturated fat and added sugar (experimental condition) or a healthier breakfast (control condition), over four consecutive days. Individuals underwent repeat testing of HDLM, interoception and biological measures, as well as completing food diaries before and during the study. At the end of the study, the experimental condition showed significant reductions in HDLM and reduced sensitivity to internal signals of hunger and fullness, relative to the control condition. The experimental condition also showed a markedly different blood glucose and triglyceride responses to their breakfast, relative to the control condition, and larger changes in blood glucose across breakfast were associated with greater reductions in HDLM. The experimental condition compensated for their energy-dense breakfast by reducing carbohydrate intake, while total and saturated fat intake remained unchanged (i.e., consistently higher than controls). This is the first evidence of a causal relationship in humans to demonstrate that a Western-style diet impacts HDLM following a relatively short exposure – just as in animals. The link between diet-induced HDLM changes and blood glucose suggests one pathway by which diet impacts HDLM. Correspondence: *Heather Francis, PhD, Neurology Department, Liverpool Hospital, Liverpool NSW 2170, Australia. heather.francis@mq.edu.au*

Symposium. Prolonged Disorders of Consciousness
Chair: Barbara Wilson
13:15-15:15

Wilson B, Rose A. Can patients with a prolonged disorder of consciousness exhibit unilateral spatial neglect?

Aim: To determine whether patients in a minimally conscious state neglect one side of space. Background observations revealed that people with a prolonged disorder of consciousness (PDOC) frequently keep their head turned to one side and fail to cross the midline when tracking, suggesting a neglect of one side of space. We decided to systematically investigate this. Methods: All patients with a PDOC at a rehabilitation centre (N = 13) were assessed in three ways. First, we ensured they could see and had sufficient movement to allow them to move across the midline. Following this we excluded four patients leaving us with nine patients who could participate. Second, and in random order, we showed the participants a stimulus on the left, the right and the middle (10 times in each position). Third, we showed the patients a video clip to track and determined whether or not they crossed the midline. Results: For the assessments where participants were requested to look at a stimulus, we determined which patients showed a 20% or more difference in looking to one side. Three of the nine patients (30%) showed this pattern. Of those that failed to cross the midline when tracking, we found performance was variable with some people failing on some occasions but not on others (stroke patients with neglect are also variable). Conclusions: It is possible that some patients with a PDOC show unilateral spatial neglect but more robust ways of assessing this for people with a severely limited behavioural repertoire are required. Correspondence: *Barbara Wilson, PhD, The Oliver Zangwill Centre, Ely, UK and The Raphael Medical Centre, Tonbridge, UK, The Oliver Zangwill Centre, Princess of Wales Hospital, Lynn Rd., Ely, Cambridgeshire, CB6 1DN, United Kingdom. barbara.wilson00@gmail.com*

Gosseries O, Aubinet C, Cassol H, Wannez S, Laureys S, Murphy L. Cognitive assessments and multimodal neuroimaging interactions in patients with disorders of consciousness

Previous studies reported some patients with prolonged disorders of consciousness after severe brain injury present residual cognitive functions. Yet bedside assessment of these functions is compromised by patients' multiple impairments, in particular, motor skills. Consequently, a new test was elaborated, the Cognitive Assessment by Visual Election (CAVE), which includes six subtests evaluating recognition of real objects, numbers, written words, letters, pictures and colours. An extended version also assesses orientation, semantic processing, picture recall and mental arithmetic. In this study, we compare results of the CAVE with brain data acquired with positron emission tomography (assessing metabolism) and magnetic resonance imaging (MRI, assessing structure and functional resting state connectivity). We included patients in minimally conscious state and patients who had emerged from that state. Most patients were able to partially complete the CAVE and showed residual recognition of real objects, numbers and pictures. Due to the higher cognitive load required, the extended CAVE was more difficult to perform but presented some interesting data. Neuroimaging results were heterogeneous, particularly regarding cerebral metabolism, but most patients showed globalized cortical and subcortical atrophia with relatively preserved fronto-parietal, auditory and default mode networks. Moreover, patients' behavioural cognitive abilities generally paralleled their neuroimaging results although some discrepancies were observed in some patients. This study based on case reports demonstrates the usefulness of the CAVE to assess cognition by means of visual material in patients with low levels of consciousness. It also showed that behaviour usually matches brain function and structure. Correspondence: *Olivia Gosseries, PhD, Coma Science Group, GIGA consciousness, University of Liege, Belgium, Avenue de l'Hopital, 1 Sart-Tilman 4000, Liège Belgium. ogosseries@ulg.ac.be*

Badwan D. Prolonged disorders of consciousness: Continuing dilemmas

In spite of major progress in brain injury management and reduction in mortality and increasing survival, in catastrophic brain injury resulting in prolonged disorder of consciousness,

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the diagnosis remains a dilemma to many. At present inaccuracies in the diagnosis remain at around 40%. Such inaccuracies have substantial implications in the medico-legal as well as the ethical domains. The paper will explore the difficulties in the diagnosis from both the medical and the behavioural prospective. In particular the differentiation between vegetative and minimally conscious states and the implications of the lack of clarity in such a diagnosis. The paper will also explore the behavioural assessments forming the mainstay for the present diagnostic criteria and as to whether a more objective process can be used in affirming such diagnosis. Correspondence: *Derar Badwan, PhD, University Hospitals Coventry and Warwickshire NHS. Trustderar.badwan@swft.nhs.uk*

Yelden K, Duport S, Leon J, Farmer S, Kempny A, Leff A, Playford D. Effect of circadian rhythm optimization on behavioural and event related potential responses in prolonged disorders of consciousness

Objective: The objective of this study was to examine the effect of circadian rhythm and sleep optimization on behavioural and electrophysiological responses in PDOC patients. Methods 10 people with PDOC, 2 to 8 years after brain injury were included in the study (5 female, age 30-71). CRS-R, 24-hour PSG and 4-hourly saliva melatonin measurements, mismatch negativity (MMN) and subject's own name (SON) experiments were performed twice at baseline and following intervention. Intervention consisted of melatonin treatment at night and blue light and caffeine treatment in the morning for five weeks. The PSG data were collected using an ambulatory EEG system and sleep staging was done. Melatonin results were analysed with cosinor analysis. Results: Baseline sleep architecture was abnormal in all patients. With intervention, improvement of sleep stages and/or sleep-wake patterns were detected in 8/10 patients. Cosinor analysis of saliva melatonin results revealed that average baseline % rhythmicity was low. (Mean: 31%, Range: 13-66.4%, SD: 18.4). Increase in % Melatonin Rhythm following intervention was statistically significant ($p = 0.012$). Seven patients had improvement of CRS-R scores with intervention. Paired samples T-test revealed statistically significant improvement of CRS-R scores ($p = 0.034$). Conclusions: Sleep and circadian rhythms are severely deranged in PDOC. Optimization of circadian rhythms and sleep with melatonin, caffeine and blue light treatment led to improvement of all physiological parameters measured – and most importantly of CRS-R scores and event-related potentials. Correspondence: *Kudret Yelden, PhD, Royal Home and Hospital Putney, London. kyelden@rhn.org.uk*

Paper Presentations. Pediatric Brain Injury/Autism Spectrum Disorders 13:15-15:15

Bernard C, Ponsford J, McKenzie D, McKinlay A, Krieser D. Long term outcomes following mild traumatic brain injury in childhood

Background: Whether mild traumatic brain injury (mTBI) sustained during childhood results in persistent post-concussive symptoms (PCS), over and above those experienced by children who sustain mild trauma to the body, remains highly debated. The current study adopted a prospective longitudinal design to examine the relative influence of injury and non-injury factors in longer term outcomes (> 6 months) following mTBI in childhood. Method: Participants were 64 parents of children (31 mTBI, 33 trauma controls) who sustained injuries between the ages of 2 and 12. The main outcome variable, PCS, was assessed at time of injury, 1 week, and 1, 2, 3, and 6 or more ($M = 24.3$, $SD = 8.4$). Information on a range of non-injury factors such as demographic, premorbid child and family factors were also collected, and examined as predictors of outcome. Predictive analysis was undertaken using a random effects ordinal regression model. Results: By six months or more post-injury rates of PCS were comparable between mTBI and trauma control children. Having sustained an mTBI was predictive of poorer outcomes up to three months post-injury but not at six months or more post-injury. Rather, pre-injury child and family factors, such as pre-existing learning difficulties and increased levels of parental stress, were stronger predictors of persistent PCS. Conclusions: While injury factors were associated with PCS in the first three months post-injury, their association weakened over time. Non-injury factors were stronger predictors of more persistent PCS, and therefore provide an important target for early intervention in 'at risk' children. Correspondence: *Coco Bernard, PhD, Royal Home and Hospital Putney, 24 Willis St Prahran Victoria 3181 Australia. coco.bernard@monash.edu*

Yeates K, Bacevice A, Bangert B, Cohen D, Mihalov L, Zumberge N, Taylor G, Bigler E, Hunsaker N. Integrity of the anterior corpus callosum predicts outcomes of pediatric mild traumatic brain injury

Objective: To determine if the integrity of the corpus callosum as measured by diffusion tensor imaging is predictive of neurocognitive test performance or post-concussive symptoms (PCS) in children with mild TBI. Participants and method: As part of an ongoing study, children 8-16 years of age with mild TBI ($n = 91$) or orthopedic injuries (OI; $n = 56$) were recruited prospectively from EDs at two large children's hospitals. At 10 days' post-injury, they completed 3T magnetic resonance imaging that included diffusion tensor imaging (DTI). After preprocessing, deterministic tractography was performed on the diffusion weighted images using Automated Fiber Quantification (AFQ) software to reconstruct the anterior corpus callosum. Average fractional anisotropy (FA) across the entire fiber tract was extracted for each individual. Children also completed the NIH Toolbox cognitive battery and they and their parents rated PCS at 10 days' post-injury. Results: The mild TBI and OI groups did not differ in mean FA for the anterior corpus callosum. After controlling for pre-injury symptoms and group membership, FA was significantly negatively related to parent-rated cognitive symptoms and child-rated somatic symptoms. Additionally, the group X FA interaction was a significant predictor of fluid cognitive skills. The association of FA with fluid cognitive skills was positive in the OI group, but negative in

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the mild TBI group, such that group differences in fluid cognitive skills were largest among children of higher FA. Conclusions: These preliminary findings suggest that the integrity of the corpus callosum may be associated with the outcomes of mild TBI in children. However, the groups did not differ in FA of the anterior corpus callosum, and the relationship of FA to PCS was of similar magnitude in both groups, suggesting that the association of FA and PCS is not specific to mild TBI. Correspondence: *Keith Yeates, PhD, University of Calgary, 2500 University Dr. NW AD 254 University of Calgary, Canada, AB T2N 3A9. kyeates@ucalgary.ca*

Lindor E, Rinehart N, van Boxtel J, Fielding J. Motor difficulties in Autism Spectrum Disorder are associated with impaired perception of interactive movement

The ability to perceive human movement and infer its intention is fundamental to social functioning and known to be partly influenced by the observer's own motor capabilities. While many children with Autism Spectrum Disorder (ASD) exhibit motor difficulties, few studies have considered how the nature and severity of their motor symptoms affect their perception of human movement. The current study aimed to explore this relationship and clarify inconsistent findings on movement perception abilities in ASD. Thirty-one participants [10 with ASD and motor difficulties (ASDMD), 8 with ASD and no motor difficulties (ASDNMD) and 13 typically-developing controls (TD)] watched a series of interactions performed by two point-light actors and reported their observations while their eye movements were tracked. Results indicated comparable perception of the interactions in the TD and ASDNMD groups, and relatively poorer perception in the ASDMD group ($p = .054$ and $p = .003$ respectively). On ocular motor measures, the TD and ASDNMD groups preferentially attended to the actor initiating the interaction ($ps < .01$), whereas the ASDMD group showed no preference. Interestingly, the ASDNMD group generated more saccades between the two actors relative to the other groups ($ps < .05$). These results emphasise the adverse influence of motor symptomology on movement perception in ASD. Furthermore, they suggest that a subgroup of children with ASD who are unaffected by motor difficulties may be able to employ an attentional style that promotes normal perception. An increased understanding of the factors influencing movement perception in children with ASD may provide insights into the mechanisms that underlie core social deficits. Correspondence: *Ebony Lindor, Doctor of Psychology (Clinical Neuropsychology) Candidate School of Psychological Sciences and Monash Institute of Cognitive and Clinical Neuroscience, Monash University, 5/216 North Rd Brighton East VIC, Australia. ebony.lindor@monash.edu*

Park P, Tsukiura, T, Nakamichi K, Nakamura A, Funabiki Y. Impaired and preserved processes of time-related information in adults with high-functioning Autism Spectrum Disorder

The processing of time-related information includes two main dimensions of how long the time was passed and how experienced events were ordered. Although previous studies have demonstrated a possible impairment of these processes in autism spectrum disorder (ASD), the evidence in adults with high-functioning ASD is scarce. In the present study, we investigated behavioural performance of the time-related tasks in the ASD participants; 16 high-functioning ASD (mean age = 31.0 years) and 18 age- and IQ-matched individuals with typical development (TD: mean age = 31.1 years) performed the recency judgment and time perception tasks. In the recency judgment, participants were presented with two pictures learned previously, and judged which picture was presented more recently. In the time perception task, participants were required to estimate how much time had passed explicitly (prospective time perception) or implicitly (retrospective time perception). All participants were assessed by a scale for ASD (MSPA: Funabiki *et al*., 2011). Results demonstrated that compared to TD, hit rates of the 5-lag condition in the recency judgment were significantly impaired in ASD, and that errors in the prospective time perception were significantly higher in ASD than TD. In addition, hit rates of the 5- and 10-lag condition in the recency judgment, and errors of the prospective time perception were predicted by individual variance of 'communication' and 'sleep cycle' or 'gross motor' in MSPA. Several processes of time-related information could be impaired in adults with high-functioning ASD, and the disturbances could be associated with several features observed in ASD. Correspondence: *Paeksoon Park, PhD, Kyoto University, Yoshida-nihonmatsu-cho, Sakyo-ku, Japan. sisesap8910@ybb.ne.jp*

Poster Presentations. Adult Assessment 13:15-15:15

Swanepoel H. An analysis of the court's expectations of neuropsychological evaluations in motor vehicle accident claims as perceived by legal practitioners in South Africa

Neuropsychology has been a rapidly developing sub-speciality of psychology and forensic psychology in which practitioners apply the concepts of neurology to assist legal decision making. Due to its dramatic evolution over the past decades, neuropsychology has been deemed the most rapidly developing subspecialty within psychology in South Africa. Given the relatively nascent nature of neuropsychological practice, prior surveys and status updates indicated that it is not always clear as to what the legal practitioner expects from neuropsychological practitioners. Furthermore, there seems to be no consensus between neuropsychologists as to what the courts expect from a neuropsychologist as an expert or what format such evaluation should take as, until recently, no formal training was available in South Africa. In this light unnecessary criticism from legal representatives are made about neuropsychological evaluations due to the lack of a set format for these types of evaluations. Furthermore, the only option for clinicians was to individually determine the court's expectations as well as the prescribed methodology of neuropsychological evaluations. By following international and local trends, local clinicians, tried to evaluate their clients using the most current and appropriate neuropsychological materials available, but the frame of reference was falling back onto the assessment methods learnt in university. Therefore, in determining the court's

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expectations, South African psychologists can be guided to work towards the same practice standards. This talk will give insight into expectations of 20 experienced legal practitioners who were interviewed. Correspondence: *Henk Swanepoel, PhD, PASACP postnet suite 208, Private Bag X1007, Lyttleton, Centurion, South Africa 0140. info@henkswanepoel.co.za*

Wu LM, Amidi A, Tanenbaum M, Hall SJ, Bovbjerg K, Diefenbach MA. Self- and spouse-reports of cognitive impairment in cancer patients: Associations with neuropsychological performance and health-related quality of life

Objective: Self-reported cognitive impairment often does not correlate with neuropsychological test performance. Evidence is equivocal regarding whether informant reports add to the prediction of neuropsychological performance. However, self- and informant-reported cognitive functioning may be important due to associations with health-related quality of life (HRQOL). This study assessed prostate cancer patients on androgen deprivation therapy (ADT) to see whether: 1) self-reported cognitive functioning is correlated with spouse reports of patient cognitive functioning; 2) self-reports and spouse reports of patient cognitive functioning predict neuropsychological performance; and 3) self-reports, spouse-reports and/or neuropsychologically-assessed cognitive functioning are associated with HRQOL. Participants and methods: Thirty-five ADT patients completed computerized neuropsychological tests (CNS Vital Signs) and a HRQOL measure (FACT-P). Both patients and their spouses completed the Patient Assessment of Own Functioning Inventory (focused on the patient's cognitive functioning in different domains). Correlations and regression analyses were undertaken. Results: Self-reported cognitive functioning was significantly associated with spouse reports overall ($r = .53$, $p = .001$), in language and communication ($r = .58$, $p = <.001$), and higher level cognitive/intellectual functioning ($r = .45$, $p = .007$). Spouse reports of motor/sensory-perceptual functions significantly predicted patient neuropsychological performance in the equivalent domain (i.e., Motor Speed; $p = .045$). Self-reports and spouse reports of patients' overall cognitive impairment were associated with poorer quality of life ($r = .35$, $p = .04$ and $r = .46$, $p = .006$ respectively), but neuropsychologically-assessed cognitive functioning was not ($r = .10$, $p = .59$). Conclusions: Findings underscore the value of patient and informant reports of cognitive functioning, even if they are not consistently associated with neuropsychological test performance. Correspondence: *Wu Lisa, PhD, Northwestern University Feinberg School of Medicine, 633 North St. Clair, Office 19-073, United States. lisa.wu1@northwestern.edu*

Bouman Z, Claassen T, Hendriks M, Van Dijk M. A causal modelling approach of the Dutch Wechsler Memory Scale – Fourth Edition (WMS-IV-NL): Exploring memory structure

Objective: The Wechsler Memory Scale (WMS) is one of the most widely used test batteries to assess the theoretically supposed structure of memory functions in participants with or without memory impairments. In consistence with the theoretical structure of long term memory and working memory, the WMS-IV-NL reflects different memory aspects such as visual and auditory memory and visual working memory. Confirmatory factor analytical (CFA) studies supported a three-factor solution for the adult battery (auditory memory, visual memory and visual working memory) and a two-factor solution for the older adult battery (auditory memory and visual memory). In the present study, we applied Bayesian Constraint-based Causal Discovery (BCCD) to achieve a more finegrained understanding of the factor structure and compared the results with the classical CFA. Methods BCCD algorithms were applied on the data of 1246 healthy participants who completed the WMS-IV-NL; the adult battery (16-69 years; $n = 726$) and older adult battery (65-90 years; $n = 520$). Conclusions: BCCD results revealed that if we remove the indexes and only analyse subtest scores, Logical Memory and Verbal Pairs, and also Spatial Addition and Symbol Span show weak connections. All delayed subtests are dominated by the association to the immediate conditions. Furthermore, the construct of (visual) working memory seems not strongly supported by the data as a distinct psychometric entity. Therefore, we conclude that BCCD provides a different view on the complex nature of memory as a construct, and modern causal discovery methods can provide a valuable source in validating psychometric instruments. Correspondence: *Zita Bouman, PhD Radboud University Nijmegen, Donders Institute for Brain, Cognition and Behaviour Centre for Cognition/Neuropsychology and Rehabilitation Psychology, Montessorilaan 3 6525 HR Nijmegen. Z.bouman@donders.ru.nl*

Pillay C, Gadd C, Semenya B. A preliminary standardisation of the Letter Cancellation Test for military personnel

Psychological assessment in the South African (SA) context is under significant scrutiny due to the history of its misuse and the lack of appropriate norms. The lack of appropriate standardisations presents considerable risk for misdiagnosis and test bias. Subsequently, SA literature in psychometry is filled with calls for test standardisations. This study thus set out to develop a preliminary standardisation of the Letter Cancellation Test (LCT), for a military population. The LCT is a commonly used neuropsychological screening test for attention and concentration. Effective daily functioning requires the ability to focus on the task at hand, simultaneously ignoring distracting factors. Attention and concentration are an essential neuro-cognitive variable for effective execution of military responsibilities. The literature review indicated limitations in the test's standardised instructions, thus hampering its reliability and sensitivity. Additionally, existing LCTs provide broad cut-off scores, such as an individual usually performs the task in 2 minutes with 2 errors, thus a limited screening of attention and concentration. A test without standardised procedures leaves room for error and is not reliable. The literature review revealed certain principles that add to the standardised administration procedures. With regards to the LCT, this presentation will highlight: 1) The principles used in compiling standardised instructions; 2) Additional scoring

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criteria; 3) Preliminary normative data for the SA military population; 4) Preliminary reliability data for the SA military population. Finally, comments will be made regarding challenges encountered during this study and recommendations for further standardisations within the military population and the greater SA population. Correspondence: *Chevon Pillay, MSc Clinical Psychology student, Applied Psychology Department. chevonhp@gmail.com*

Scott T, Gouse H, Joska J, Robbins R. Establishing equivalency between an English and isiXhosa Verbal Learning Test for South Africa

Objective: Few verbal list learning tests have been evaluated for use with multilingual black South Africans. The present study examined a modified Hopkins Verbal Learning Test-Revised (HVLT-R) for multi- and mono-lingual adults who identified their home language as isiXhosa. Specifically, we examined the effects of test administration language (i.e., English and isiXhosa), gender, age, and education on test performance. Methods: Items from the HVLT-R Form A were reviewed and modified for English- and isiXhosa-speaking black South African adults. One hundred and twelve adults (49% male) with no major medical, neurological, or psychiatric problems were administered the test (51 in English, 61 in isiXhosa) by bilingual psychometrists. Results: English-language examinees were significantly ($p<.01$) younger (M = 30.5 years, [SD = 10.5]) and more educated (M = 11.0 years, [SD = 1.3]) than isiXhosa-language examinees (M = 39.5 years [SD = 11.7], M = 10.2 years [SD = 1.5], respectively). Independent t-tests revealed no effect of test language on performance across all learning and delayed recall trials. Multivariate regressions examining (a) total learning ($R2 = .15$, $F(4, 107) = 4.66$, $p<.01$) and (b) delayed recall ($R 2 =.11$, $F(4, 107) = 3.17$, $p = .02$) found that more education ($B = .56$, $p = .04$; $B = .34$, $p = . 01$, respectively) and being female ($B = -2.77$, $p <.01$; $B = -.98$, $p = .01$, respectively) predicted better learning and delayed recall performance. Test language was not associated with test performance in either model. Conclusion: Performance on this modified HVLT-R appears equivalent across English and isiXhosa, which makes comparisons between language administrations appropriate. Gender and education should be considered when making comparisons. Future research should consider individual item performance across administration languages. Correspondence: *Travis Scott, PhD student, Fordham University, 139 Payson Ave Apt 3D, United States. tshivleyscott@fordham.edu*

Van der Linden S, Sitskoorn M, Gehring K, Emons WHM, Rijnen S. Test-retest reliability and practice effects of the computerized neuropsychological test battery CNS Vital Signs: Evaluation in a Dutch healthy sample

Introduction: CNS Vital Signs (CNS VS) is a computerized neuropsychological test battery that is translated into many languages. Test-retest reliability and potential practice effects of CNS VS were evaluated. Method: Dutch healthy participants were tested with CNS VS (T0), and retested after 3 (T1) and 12 months (T2). CNS VS consists of 7 tests (i.e., Verbal Memory, Visual Memory, Finger Tapping, Symbol Digit Coding, Stroop, Shifting Attention and Continuous Performance), which cover multiple cognitive domains. Test-retest reliability was determined using Pearson's/Spearman's correlations. To evaluate potential practice effects, paired-sample t-tests were conducted (T0 versus T1, and T1 versus T2). Results: 159 (57% female) subjects, aged 20 to 80 years, were included. At T1 and T2, 132 and 63 subjects were retested, respectively. Low to high test-retest correlations were found for CNS VS' tests and domains (r/ρ ranging from .17 to .89). At T1, participants performed significantly better on CNS VS' Stroop Test, Shifting Attention Test and Symbol Digit Coding Test, resulting in significantly higher scores on the domains of Cognitive Flexibility, Processing Speed and Reaction Time, but Cohen's d effect sizes were small. No significant differences in performance were found between T1 and T2. Discussion: The observed test-retest reliabilities varied considerably. Practice effects were present between the first and second assessment, but not thereafter. Practice effects must be considered when interpreting performance on CNS VS at follow-up assessment. Our findings are in line with previous studies that evaluated CNS VS and correspond to existing literature on conventional (paper and pencil) tests. Correspondence: *Sophie Rijnen, MSc, Elisabeth-TweeSteden Hospital (Department of Neurosurgery), Tilburg University (Department of Cognitive Neuropsychology), 123 Street, Tilburg, The Netherlands. s.d.vdrlinden@uvt.nl*

Gouse H, Joska J, Robbins R, Henry M, Scott T. Examinee experience of a brief, tablet-based neuropsychological assessment for isiXhosa-speaking South Africans

Objective: Neuropsychological testing on computers and tablets is increasing. However, in resource-limited settings, such as South Africa, experience with computers and tablets is often limited. NeuroScreen is a novel, brief, tablet-based app to assess neuropsychological functioning. It was developed for resource-limited settings and to be administered by lay professionals. We examined participant experience using NeuroScreen. Methods: NeuroScreen was administered to 216 isiXhosa-speaking South Africans (age, M = 34.2, SD = 10.1; years of education, M = 10.4, SD = 1.8) by four different lay-counsellors. Participants were asked if they ever used a computer, smartphone or tablet, and to rate their comfort using these technologies. They were also asked about their comfort using NeuroScreen. Lay-counsellors recorded any technological issues with the tablets. Results: Fifty-two percent of participants reported never using a computer, 33% never using a smartphone, and 63% never using a tablet before. Most participants reported feeling "comfortable" to "very comfortable" using computers (67%) and smartphones (78%); 82% reported that the NeuroScreen tablet was "somewhat easy" to "very easy" to use. Of NeuroScreen tasks, 42% reported that "none" of the tasks were difficult, and 57% reported that one task was difficult; 91% reported that at least one task was easy. Technical difficulties were reported on seventeen occasions. Conclusion: NeuroScreen appears easy to use and highly acceptable with isiXhosa-speaking South Africans. While

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appearing to be user friendly and acceptable to users, additional research is needed to validate its embedded tests. Correspondence: *Hetta Gouse, PhD, University of Cape Town, 103 Woodhill, 15 Woodside Road, Tamboerskloof, Cape Town, South Africa. hetta.gouse@uct.ac.za*

Vingerhoets G, Sack V, Stove J, vander Stichelen J, Vanrietvelde S, Oostra K, Lannoo E. Differences in tool knowledge between brain injured patients with and without apraxia

We investigated knowledge about tools in 63 brain injured patients referred with suspicion of apraxia by rehabilitation staff. A custom-built test battery assessed sensory knowledge (visual, auditory, and tactile recognition of tools), descriptive knowledge (tool naming, description of tool function, and associated milieu), and procedural knowledge (functional grasp position, functional movement, functional body position, and mechanical reasoning). Non-verbal responses were allowed for all tasks except for tool naming. Most patients had had strokes and 24% had suffered traumatic brain injury. Compared to a matched control cohort, the patient group performed significantly worse on every test measure ($F[1,115] = 11.20$, $p < .001$). In 48% of patients, presence of apraxia was confirmed by an apraxia test. Patients with and without apraxia showed no group differences with regard to sex, age, education, or type of brain injury, but patients with apraxia were more likely to have left-sided lesions (χ^2 (2) = 8.96, p = .011) and performed worse on a test of receptive language ($t(61) = -2.82$, $p = .01$). A multivariate analysis of variance with Language score as covariate showed a significant effect of Group ($F [10,51] = 2.29$, $p = .04$) and Language score ($F [10,51] = 3.34$, $p=.002$). Univariate post-hoc tests revealed that after correction for aphasia, patients with apraxia differed from non-apraxic patients only by worse performance on tool naming ($F (1) = 7.07$, $p = .01$), function description ($F (1) = 5.68$, $p = .02$) and mechanical reasoning ($F (1) = 5.51$, $p = .02$). We conclude that brain injured patients in general show deficits on tasks that probe tool-related knowledge even when not apraxic. Patients with apraxia show worse scores on tool naming, description of tool function, and mechanical reasoning compared to those without. Correspondence: *Guy Vingerhoets, PhD Henri Dunantlaan 2 B-9000 Ghent, Beljium. guy.vingerhoets@ugent.be*

Montgomery V, Spencer RJ, Bieliauskas LA. Complaints of difficulties handling business affairs is predictive of poorer cognitive performances in a well-educated sample

Individuals with high cognitive reserve often report problems with IADLs before performance deficits are evident on some neuropsychological measures. Because patients with advanced education are likely to present well in primary care settings, subtle cognitive changes are often undetected. The purpose of this study was to examine the degree to which self-reported difficulty with handling business affairs, taxes or related paperwork predicts scores on the Montreal Cognitive Assessment (MoCA), a screening measure of global cognitive functioning. Data from initial visits of 827 participants (education = 16.32 years; age = 68.62) who completed the MoCA from the NACC database (1/24/17) were analyzed. A multiple regression was run to predict MoCA scores, with predictors being age, years of education, and self-reported difficulties with business affairs. The overall model was significantly predictive of MoCA performance ($F (3,823) = 51.46$, $p < .001$). Unique effects were found for inability to handle business affairs, [$t (823) = -2.16$, $p = .03$, $\beta = -.07$] beyond the other predictors in the model. The present findings suggest that highly educated individuals who report difficulties handling business affairs, taxes or related paperwork are more likely to score lower on the MoCA than those who report no difficulties (25.08 vs 26.26). Awareness of difficulties with IADL's may be a particularly sensitive indicator of cognitive decline in individuals with high cognitive reserve. Correspondence: *Valencia Montgomery, Psychology Intern, VA Ann Arbor, 320 S. Huron #1, Ypsilanti, Untited States. vmontgomery@mail.roosevelt.edu*

De Vent N, Schmand B, Huizenga H, Muree J, Angelik van Rentergem J. The Advanced Neuropsychological Diagnostics Infrastructure (ANDI)

In the Advanced Neuropsychological Diagnostics Infrastructure (ANDI), datasets of several research groups are combined into a single database, containing scores on neuropsychological tests from healthy participants. For the most popular neuropsychological tests the quantity and age range of these data surpass that of traditional normative data, thereby enabling more accurate neuropsychological assessment. The unique structure of the database facilitates normative comparison methods that were not feasible before, in particular those in which entire profiles of scores are evaluated. In our presentation, we will describe the steps that were necessary to combine the separate datasets into a single database. Next, we will give a description of the current content of ANDI, and we will show the interactive website that accompanies ANDI, which can be used for normative comparisons. Finally, we will show a proof of principle of ANDI. We will do this by predicting onset of dementia in Parkinson disease patients, using impairment classifications made with the ANDI database. Correspondence: *Nathalie de Vent, PhD student, University of Amsterdam, Department of Psychology, Nieuwe Achtergracht 129 Kamer G 1.03 Postbus 15916 100,1 NK, Amsterdam. n.r.devent@uva.nl*

Birch Lecture. Personalised Medicine: The Role of Neuropsychology
Presenter: Donald Stuss
15:30-16:30

Stuss DT. Personalised Medicine: The Role of Neuropsychology

Clinical trials to treat brain disorders have largely had very modest or time-limited effects; many have been outright failures – all these efforts with significant costs. The evolving response has been a call for more effective and targeted treatments – personalized medicine, or sometimes called "precision" or "stratified" medicine. These labels reflect a growing awareness of one major cause of these

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clinical failures – our labels and clinical diagnostic categories are too broad, imprecise, or even incorrect. Even beyond clinical trials, neuroscience research is often hampered by this variability of performance among the individuals included in what seems like a well-defined supposedly homogeneous group. This review presents several examples of heterogeneity among defined clinical syndromes to illustrate how variability was explored and "harnessed" to advance the understanding of specific brain-behaviour relations. Several examples are from the presenter's own research in traumatic brain injury and the study of "executive functions" and frontal lobe focal dysfunction. Other examples are related to Alzheimer's disease. The possible application of this more "precision" based approach to neurorehabilitation of individuals who have suffered traumatic brain injuries will be presented. A final section summarizes how this awareness of clinical heterogeneity informed the establishment of an administrative structure that integrates different types of information (genetic to behavioural) and basic and clinical science to improve diagnoses and care, and how neuropsychology/behavioural analyses can play an important role for both diagnostic phenotyping and more sensitive outcome measures. Correspondence: *Donald Stuss, PhD, Sunnybrook Research Institute. donaldt@stussassoc.ca*

Invited Symposium. Neuropsychology in low resource settings: Challenges and priorities
Chair: Ann Watts
16:30-18:30

Hestad KA, Menon JA. Building neuropsychology expertise in Zambia: Priorities and challenges

To address the heavy burden of HIV and possible neurocognitive effects of HIV, a Masters programme in Neuropsychology related to HIV and AIDS was established at the University of Zambia, supported by funds from NORAD masters programme and expertise from Norway and the United States of America. The objective of the programme was to prepare students to be able to function as independent professional practitioners of clinical neuropsychology. This led to the training of students, professional development of staff, institutional development, and research and publications. In addition, norms were established for a battery of neuropsychology tests sensitive to HIV effects. This presentation will highlight the priorities and challenges experienced in building neuropsychological expertise in Zambia. Correspondence: *Hestad Knut, PhD, Norwegian University of Science and Technology. knut.hestad@inn.no*

Sodi T. Assessing traumatic brain injury in rural communities in Limpopo Province, South Africa: Challenges and prospects

Traumatic brain injury (TBI) is reported to be one of the leading causes of death and disability in the world. In South Africa, road accidents have been found to account for over 20 deaths per 100 000 people, with an even higher number who survive these accidents having to live with some neurological impairments. Assessing the neurological impairments resulting from traumatic brain injuries is at times a challenge that results in poor treatment and rehabilitation outcomes. In developing countries, these challenges are often compounded by the lack of resources and other constraints that may not be experienced in the developed world. Drawing from own clinical experience of assessing persons with traumatic brain injury in rural communities in Limpopo Province (South Africa), the author reflects on some of the key challenges that are encountered in such low resource settings. Among others, these include the challenges associated with language, culture and the relevance of available psychological instruments. While acknowledging the challenges, the author also highlights some of the innovative opportunities that can be explored in order to provide the needed neuropsychological services in rural communities. More than twenty years after the demise of apartheid, professional psychology education and training in South Africa has continued to suffer the adverse consequences of a colonial system that was characterised by institutionalised racism. Consequently, the developmental trajectories of psychology as an academic discipline, and as a profession, have continued to be influenced by this regrettable past. In this presentation, I will start by briefly outlining the history of professional psychology and the critical factors that have shaped this development. The second part of the presentation will provide a critical analysis of the development of professional psychology during and after the transition to a democratic dispensation in South Africa. Issues relating to education and training of psychologists in South Africa and the regulation of the profession of psychology will be discussed. In the third part of the presentation, some of the success stories associated with the transformation of professional psychology will be highlighted. The fourth part of the presentation will focus on the challenges that the profession of psychology has faced and continues to face as a result of internal and external factors. The presentation is concluded by highlighting the need to internalise psychology and the training of professional psychologists in (South) Africa while at the same time accommodating the sociocultural realities of local communities. Correspondence: *Tholene Sodi, PhD, University of Limpopo, Sovenga, South Africa. tholene.sodi@ul.ac.za*

Mate-Kole CC. Neuropsychology in Ghana: A new beginning or a wild goose chase?

Neuropsychological assessment is an integral part of general assessment in clinical practice. While the emphasis seems to have shifted from diagnosing brain dysfunction to assisting the patient with recovery, in our setting, the focus is on assessment although there are varied attempts at rehabilitation. Also apparent is the shift in the traditional method of assessment to a more pragmatic approach to enable us to understand the cultural and socioeconomic factors that are relevant in assessing the patient, and to examine the nature and pattern of their challenges, as without an adequate and careful assessment process rehabilitation becomes futile. Thus, one would find oneself in search of areas of cognitive and behavioural deficits that may be

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untenable. In many parts of the world, neuropsychology has gained significant reputation; it is the foundation of contemporary clinical practice. In sub-Saharan countries where psychology in general, is beginning to gain some grounds, neuropsychology is relatively new. For many years, clinical psychologists conducted assessments and treatment with little effort to embrace neuropsychology. In the past few years in our setting, neuropsychology is beginning to receive some attention from healthcare professionals, especially physicians. While some welcome neuropsychology with interest, others display some level of "la belle indifference". In this presentation, we will highlight successes and challenges of neuropsychological assessment and rehabilitation in our setting with low resources. We will provide a series of case studies to buttress our experience and provide direction for the future of neuropsychology in this part of the world. Despite the lukewarm reception, the future of neuropsychology in Ghana is promising. However, to ensure its success, many cultural values should be considered. Thus, the concept of neuroethology may be relevant here. Correspondence: *Mate-Kole C. Charles PhD, Department of Psychology, Departments of Psychology, Psychiatry, & Internal Medicine; Centre for Ageing Studies, University of Ghana, PO Box LG 84 Accra, Ghana. cmkole@ug.edu.gh*

Pillay B. The practice of neuropsychology in the South African Public Health Service

Approximately 80% of the SA population is dependent on the public health system – the sector responsible for more than 44 million South Africans' health care, with almost half of the population living in rural settings and dependent on the primary health care system. The public sector is seriously stretched and under-resourced. The current looming crisis in health especially impacts on the mental health sector, which is always the first to experience significant cuts in posts, resources and facilities. The sector is already under-funded, under-resourced and neglected. Within this context, neuropsychological services are given very little priority. This presentation addresses various issues and challenges encountered in the provision and development of neuropsychological services in the public health arena. Correspondence: *Basil J. Pillay, PhD, Department of Behavioural Medicine, University of KwaZulu-Natal, Durban, South Africa. pillayb@ukzn.ac.za*

Paper Presentations. Executive Functions/Frontal Lobes 16:30-18:30

De Haan E, Otten M, Pinto Y, Lamme V. Split brain: Divided perception but undivided consciousness

In extensive studies with two split-brain patients, we replicate the standard finding that stimuli cannot be compared across visual half-fields, indicating that each hemisphere processes information independently of the other. Yet, crucially, we show that the canonical textbook findings that a split-brain patient can only respond to stimuli in the left visual half-field with the left hand, and to stimuli in the right visual half-field with the right hand and verbally, are not universally true. Across a wide variety of tasks, split-brain patients with a complete and radiologically confirmed transection of the corpus callosum showed full awareness of presence, and well above chance-level recognition of location, orientation and identity of stimuli throughout the entire visual field, irrespective of response type (left hand, right hand, or verbally). Crucially, we used confidence ratings to assess conscious awareness. This revealed that also on high confidence trials response type did not affect performance. These findings suggest that severing the cortical connections between hemispheres splits visual perception, but does not create two independent conscious perceivers within one brain. These findings have clear theoretical repercussions. Both the Information Integration Theory and the Global Workspace Theory imply that severing the corpus callosum should lead to a split in consciousness. The proposed model of the split-brain phenomenon is, therefore, a challenge to both these theories. Correspondence: *Edward de Haan, PhD, Department of Psychology, University of Amsterdam, Nieuwe Prinsengracht 129B, 1018WS Amsterdam. e.h.f.dehaan@uva.nl*

Youm Y, Kim J. Is there small-world correspondence between social and brain networks?

Objective: Watts and Strogatz (1998) showed that small-world structure, characterized by high local clustering yet short path length between any two nodes, is ubiquitous in natural, social and technological systems. This research aims to examine whether there exists a correspondence between the small-world tendency of the brain network of a person and small-world inclination of his or her social network in an entire village where he or she resides. Participants and methods: 814 elderly people in a township were gathered from Korean Social life, Health, Aging Project. Based on the complete social support network data of the entire village, each person was assigned to one of the four groups depending on the cohesiveness (k-core, mean = 2.29, SD = 1.06) and brokerage score (open-triads, mean = 3.99, SD = 6.27). We assume that people with high scores in both cohesiveness and brokerage were playing a role of 'small-worldness' in the social networks of the entire village; 62 people went through magnetic resonance imaging (MRI) protocol. Undirected brain functional networks between 90 cortical/subcortical regions (AAL-90) were acquired (density = 0.10). We calculated small-worldness (Humphries & Gurney, 2008, mean = 2.04, SD = 0.27), and small world propensity (Muldoon, Bridgeford, Bassett, mean = 2.51, SD = 0.49), which were normalized with random graph. Results: The four groups out of 62 people were categorized as follows: Group 1 (high brokerage, high cohesiveness n = 22), Group 2 (low brokerage, high cohesiveness n = 14), Group 3 (high brokerage, low cohesiveness n = 6), Group 4 (low brokerage, low cohesiveness n = 20). The criterion for dividing the group was the average value in the total population. People in Group 1 who enjoyed a strong cohesive local support network and at the same time, played a highly brokerage-able position in the social networks of the village showed highest scores both in small-worldness and small world propensity. Correspondence: *Yoosik Youm, PhD, Yonsei University, South Korea. yoosik@yonsei.ac.kr*

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Jansari A. Assessment of executive functions in children and adolescents with ABI using a novel complex multi-tasking computerized task: The Jansari Assessment of Executive Functions (JEF-C©)

Childhood is a time of enormous neural development so Acquired Brain Injury (ABI) during this period can have severe impacts on everyday life. Particular difficulties can be found in Executive Functions (EFs) but current assessments are limited in their sensitivity. We evaluated the feasibility of a new ecologically-valid test, the Jansari assessment of Executive Functions for Children (JEF-C©), comparing a group of children with ABI against age-matched controls. Twenty-nine children with ABI and 30 age- and gender-matched controls, aged 10-18 years, were assessed on JEF-C© as well as paper and pencil EF tests from the BADS-C, while parents completed the BRIEF questionnaire. JEF-C© uses non-immersive virtual reality and resembles a computer game in which the child has to organise and run their own birthday party multitasking a number of competing concurrent demands. We found significant differences between the groups on three out of the eleven BRIEF subscales but only the Six Elements subtest of the BADS-C. However, there were significant differences between the groups on JEF-C© total score $t(57) = 4.49$, $p < .001$ and on five of its eight individual measures: planning, selective thinking, and event-based, action-based and time-based prospective memory (all ps < 0.05). Our findings support the evidence of significant executive difficulties in children and adolescents with ABI. JEF-C© appears to be a feasible and playful complex task, allowing a thorough assessment of children's performance in a multitasking situation. It has good internal consistency; further studies are needed to determine factors influencing performance on this task. Correspondence: *Ashok Jansari, PhD Department of Psychology, Goldsmiths, University of London Lewisham Way London SE14 6NW, United Kingdom. a.jansari@gold.ac.uk*

O'Meagher S, Anderson P, Norris K, Kemp N. Sex differences in executive functions of preterm and term preschool children

Objective: It is known that school-age children born preterm are at risk of having executive function difficulties. However, little is known about sex differences in executive functions at preschool age. The aim of this study was to investigate sex differences in the executive functioning of preterm and term preschoolers using performance-based executive function assessment tools. Participants and methods: 141 children born very preterm (< 33 weeks of gestation) and 77 term controls were assessed at the age of four years, prior to starting kindergarten, on standardized performance-based executive function tests (parts of the Developmental Neuropsychological Assessment-II (NEPSY-II), Day-Night Stroop and Shape School). Results: The preterm children performed significantly more poorly on all executive function tests than did the term children. Overall, girls performed significantly better than boys on three of the seven tasks. There was no significant interaction between group and sex for any of the tasks. However, the pattern of differences between boys and girls was quite dissimilar for the preterm and term groups. Conclusions: Preterm preschool children performed more poorly than term children on executive function assessments. Further, preterm females outperformed preterm males on some of these tasks, but these sex differences were no greater than those seen in the general population. Thus, the potential disadvantages of prematurity observed for preterm boys and girls were no greater than for children born at term. However, the pattern of ability for boys versus girls might differ from that in the general population. Correspondence: *Sari O'Meagher, School of Medicine (Psychology), University of Tasmania, Hobart, Australia School of Medicine(Psychology), Faculty of Health, University of Tasmania, Private Bag 30, Hobart TAS 7001, Australia. sari.omeagher@ths.tas.gov.au*

Van Zandvoort M, Ruis C, Wajer IH, Broekman M, Seute T, Dijkerman C, Robe P. Monitoring executive functioning during intraoperative monitoring with the Stroop paradigm in 152 glioma patients

Intraoperative monitoring in awake surgery is performed in patients with both high-grade and low-grade glioma infiltrating functional brain areas to preserve cognitive functioning. Executive functioning is highly important to maintain autonomy in daily life and quality of life. A paradigm to preserve executive functioning is urgently needed. We studied the feasibility of an adapted Stroop paradigm in a sample of 256 consecutive included glioma patients within clinical care-as-usual. We compared characteristics of patients in whom the paradigm was versus was not used. In 152 (60%) of the patients the Stroop was used intraoperative. No differences in age [range 15-82], education, side (L vs R: 72.8 vs 27.2%) or grade (low vs high: 31 vs 69%) of the tumor was found between procedures with and without the use of the Stroop paradigm (all $p > 0.05$). No differences were discerned between site of the tumor(frontal/temporal/parietal/insular): (47.9/18.1/17.1/6.4). Pre-operative neuropsychological data underlines the heterogeneity and the wide applicability of this task. We conclude that our adapted Stroop paradigm is a feasible, promising tool to preserve executive functioning in both high and low-grade glioma patients. Correspondence: *Martine van Zandvoort, PhD Utrecht University Langeveld gebouw, H0.13 Heidelberglaan 2 NL-3584CS Utrecht, The Netherlands. m.vanzandvoort@uu.nl*

Halliday D, Gordon I, Agate FT, Karr J. Enhanced executive functioning revealed in electrophysiological markers in athletes with and without previous concussions

Background: Converging empirical and meta-analytical evidence is starting to demonstrate benefits of exercise to executive functioning. While most research uses acute bouts of physical exercise, elite university athletes are an excellent population in which to observe, without intervention, the natural consequences of long-term exercise practice on executive functioning. We aimed to examine these potential effects, and hypothesized that athletes will demonstrate gains on executive functioning. Methods: Electroencephalograms coupled with a set of four executive functioning tasks, were used to elicit Event-Related Potentials (ERPs) examining

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inhibition, shifting, updating working memory and reward processing. Fifty-one young adult athletes (55% females, ages 18-27) participated in the study, some with no concussion history (n = 14), positive concussion history (n = 17), and healthy sedentary controls (n = 20). Results: Converging mean comparisons of behavioural performance (reaction times, d' for accuracy) and ERPs (amplitude of P300a and P300b, N200, RewP) consistently demonstrated that athletes (with and without concussions) generally outperform sedentary controls; however, only one ERP component reached significance between groups, ANOVA F (2.48) = 5.31, $p < .01$, $\eta 2 = .18$. Post-hoc tests revealed that the RewP amplitudes in athletes with no concussion history were significantly greater than those in sedentary controls, MD = 7.61, $p < .05$. Athletes with concussion history exhibited significantly larger RewP amplitudes than sedentary controls, MD = 8.12, $p < .05$. Conclusion: Athletes exhibited a stronger electrophysiological response to reward than sedentary individuals. This holds true even in athletes who have had previous concussions. Benefits to core executive functioning are observed, and the potential effects on decision making and problem solving are discussed. Correspondence: *Drew Halliday, MSc, Psychology, University of Victoria, Department of Psychology, University of Victoria, PO Box 1700 STN CSC, Victoria, B.C. V8W 2Y2. drewh@uvic.ca*

Symposium. Severe Pediatric Traumatic Brain Injury in South Africa

Chair: Leigh Schrieff-Elson
16:30-18:30

Figaji A, Rohlwink U, Schrieff-Elson L, Thomas K. Complexities in the neurosurgical management of children following severe traumatic brain injury

A significant number of deaths and disabilities in children are associated with traumatic or other acute brain injuries. The injuries from TBI are not only limited to those sustained on impact (i.e., to the primary injury/ies). There are also secondary injuries that can occur because of the primary injury. The degree of seriousness of the primary injury may escalate rapidly and be aggravated at a secondary injury level. Hence, TBI should not be seen as one single treatable injury: it is a dynamic, progressive process. Acute care management is therefore focused on controlling the primary injury and on avoiding potential secondary injuries. This management is largely achieved by a process of controlling appropriate physiological parameters, for example, reducing intracranial pressure (ICP), maintaining adequate cerebral perfusion pressure (CPP) and systemic blood pressure (BP), and ensuring satisfactory oxygen delivery. Of importance in controlling these physiological parameters is the prevention of the deprivation of oxygen to an injured brain. Such deprivation may lead to secondary hypoxia-ischemia, an outcome that is often concomitant with severe TBI. Advances in acute care management and related increased knowledge of opportunities for intervention, such as preventing secondary injuries, have improved the prognosis for survivors of traumatic brain injuries. However, managing or preventing secondary injuries, considering the complexity of the pathophysiology surrounding these injuries, is not a simple and straightforward task. In this talk, the complexities surrounding the neurosurgical management of children following severe TBI are discussed. Correspondence: *Anthony Figaji, MBChB, MMED, FCS, PhD, 6.17 Institute for Child Health Red Cross Children's Hospital, Klipfontein Road Rondebosch, 7700, Cape Town. Anthony.Figaji@uct.ac.za*

Wepener L, Rohlwink U, Figaji A, Schrieff-Elson L. Investigating acute predictors of neuropsychological outcomes 12 months after severe pediatric traumatic brain injury

Traumatic brain injury (TBI) is one of the major causes of childhood mortality and morbidity worldwide, and research suggests that the burden of pediatric TBI (pTBI) is more severe in low and middle-income countries such as South Africa. pTBI can lead to a multitude of long term deficits across developmental and functional domains, some only becoming evident as the child ages. Multiple acute and post-acute stage predictors of outcome after pTBI have been examined, but acute stage neurological variables are relatively absent from research on neuropsychological outcomes after pTBI. The current study is a local extension to an established international research study, Approaches and Decisions in Acute Pediatric TBI Trial (ADAPT). The current research examines the nature and severity of neuropsychological outcomes 12 months after severe pTBI and investigates the ability of acute intracranial pressure (ICP) and brain oxygenation (PbtO2), to predict neuropsychological outcome 12 months after severe pTBI. The patient sample (n = 24) for the current research consists of English-, Afrikaans- and isiXhosa-speaking children aged 6-13 years admitted to Red Cross War Memorial Children's Hospital following severe TBI (GCS ≤8 after resuscitation) requiring intracranial monitoring. Their performance on a neuropsychological test battery measuring IQ, memory, executive function, attention and processing speed, as well as parent report questionnaires measuring quality of life, behaviour and executive function, will be compared to that of a typically developing matched control group (n = 24). In addition, the ability of ICP and PbtO2 to predict outcome jointly and independently will be explored using multiple multivariate regression analyses. Correspondence: *Lydia Wepener, MA Neuropsychology, Department of Psychology, University of Cape Town, Rondebosch, Cape Town, South Africa, 7700. lydia.wepener@gmail.com*

Dollman A, Figaji A, Schrieff-Elson L. Behavioural and academic outcomes and the specific role of premorbid functioning in a sample of children admitted to the Red Cross War Memorial Children's Hospital following severe traumatic brain injury

Poor neurocognitive, behavioural, and academic outcomes are common following severe pediatric traumatic brain injury (pTBI) either as direct or indirect consequences of such injuries. Pre-injury characteristics may increase risk for, and play a role in, TBI outcome, however, many studies exclude

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children with known adverse premorbid functioning. The broad aim of the study was to contribute to the existing pediatric TBI (pTBI) literature on outcomes and factors influencing outcomes. This study includes two parts. For the first part of the study, the aim was to explore academic and behavioural outcomes following severe pTBI. For the second part of the study, the aim was to investigate the specific role of premorbid functioning in these academic and behavioural outcomes. The sample included 27 children who had been admitted to Red Cross War Memorial Children's Hospital (RXH) and received intracranial monitoring for closed severe TBI between 2006-2011, who were of school-going age at the time of the injury. Regarding part 1, the results show elevated problems with academic and behavioural outcomes, and executive functioning in the sample. Regarding part 2 of the study, the data only confirmed that caregivers reported participants with evidence of premorbid problems as having a poorer behaviour regulation and overall executive dysfunction than participants with no evidence of premorbid problems. The current study adds weight to the advocacy for increased awareness of preventative measures and for identifying children, and families at greater risk for dysfunction and poorer outcomes following a TBI. Correspondence: *Aimee Kim Dollman, MA, ACSENT Laboratory, Department of Psychology P.D. Hahn Building, University of Cape Town, Rondebosch 7701, Cape Town, South Africa. aimeedollman@gmail.com*

Schrieff-Elson L, Rohlwink U, Thomas K, Figaji A. Global and cultural challenges to assessment and rehabilitation outcomes in pediatric traumatic brain injury

Pediatric traumatic brain injury (pTBI) remains a major public health problem in low and middle-income countries such as South Africa. Given the known dose-response relationship between injury severity and outcome, children who sustain severe TBIs show poorer outcomes across a range of (e.g., medical, neuropsychological, behavioural and academic) outcome domains. Although research in the field is slowly evolving, investigating these outcomes, in ways that permit generalizability, globally, is challenging both methodologically and practically. Similar challenges impact on the implementation and efficacy of cognitive rehabilitation strategies following pTBI in local contexts. Cultural and sociodemographic factors, for example, impact on both tools for assessment and cognitive rehabilitation efficacy. In this talk we explore the challenges of and outcome assessment and cognitive rehabilitation implementation with children following severe TBI in South Africa. Correspondence: *Leigh Schrieff-Elson, PhD, Department of Psychology, ACSENT Lab, University of Cape Town, Department of Psychology, ACSENT Lab, University of Cape Town. leigh.e.elson@gmail.com*

Paper Presentation. Cognitive Rehabilitation 16:30-18:30

Kessels R, Janssem M. Cognitive decline, psychological wellbeing and cerebral function in HIV-infected patients on CART: The Art-Neco Study

Objective: The objective of the current study was to integrate results from extensive neuropsychological assessment (at two-time points over a one-year course), subjective wellbeing and structural and functional neuroimaging findings in successfully treated HIV-infected patients in the Netherlands in comparison with a HIV-negative control group. Methods: 102 virologically suppressed HIV-infected patients on combination antiretroviral therapy (cART) and 56 HIV-free controls were recruited. Cognitive function and self-reported wellbeing were assessed and structural magnetic resonance MRI was performed, including resting state fMRI. Eighty-two patients and 43 controls also underwent a follow-up neuropsychological assessment after one year. Results: At baseline, HIV patients performed worse on information processing speed and motor function than controls, and reported more psychological symptoms. MRI volume reductions (total brain volume and thalamus) were related to worse motor function and information processing speed. No group differences in subcortical functional connectivity were found. Cognitive decline over time was minimal and related to more frequent use of recreational drugs, but not to HIV-related variables. Conclusion: Our results show that in successfully treated HIV patients in the Netherlands, cognitive decrements are small, as are differences in brain volume. However, lower levels of wellbeing are reported by HIV-infected patients in comparison to the healthy controls. Correspondence: *Roy Kessels, PhD, Radboud University Radboud University DCC – Neuropsychology Montessorilaan 3, 6525 HR Nijmegen. r.kessels@donders.ru.nl*

Ferreira-Correia A, Barberis T, Msimanga L. Barriers to the implementation of an Internet-based rehabilitation

The original aim of this research was to study the effectiveness of an internet-based program for the rehabilitation of working memory (WM) in two clinical groups: Schizophrenia and HIV. However, during the process of contacting and gaining permission from the public hospitals approached, relevant information emerged from the gate-keepers and participants in the research sites. Hence, a new aim was introduced: to explore the feasibility of implementing such intervention within the public healthcare system in contemporary South Africa. This research employed a sequential exploratory design, characterized by different stages of qualitative data collection that involved short interviews conducted at two points during the research: a) before the commencement of the program, b) at the end of the rehabilitation, whether it was due to completion or attrition. Field notes were kept by the researchers during the entire intervention. The experiences of the participants (n = 9) and the coaches (n = 2) were explored. The method of Thematic Content Analysis was implemented. Eight barriers were identified as predominantly affecting the take up and

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adherence to the internet-based rehabilitation program: 1) unawareness of the cognitive deficit, 2) expectations of negative results, 3) stigma, 4) ill health (unrelated to the main diagnosis), 5) difficulty accessing a computer and/or internet connection, 6) low tolerance to frustration, anxiety and fatigue, 7) daily routine challenges and 8) non-conducive/sabotaging environments. The first four barriers affected the initial engagement with the program, the fifth barrier negatively impacted the implementation of the program in different stages, and the last three barriers were mainly associated with attrition during implementation. In conclusion, despite the need for cognitive rehabilitation in the public health sector, implementation of rehabilitation options are not always successful. Studying and understanding the reasons for failed implementation are necessary in order to design treatments that are targeted to the nuances of specific settings. Correspondence*: Aline Ferreira-Correia, MA, University of the Witwatersrand, 21 7th Avenue, Florida. Aline.FerreiraCorreia@wits.ac.za*

Withiel T, Mihaljcic T, Wong D, Cadilhac D, Stolwyk R, Ponsford J, New P. A comparison of restorative and compensatory approaches to memory rehabilitation post-stroke (RESTORE): A phase II randomised controlled trial

Objective: Memory deficits are common following stroke and have been independently linked to poorer rehabilitation and quality-of-life outcomes. Two competing approaches to improve memory have historically been used: computer-based restorative training and compensation strategies. Our aim was to compare the effectiveness of computer restoration training and compensatory memory skills training following stroke. Participants and method: Sixty-five survivors of stroke with subjective memory complaints (median age 63 years, 56% male) were randomised into one of three groups: computer restoration training, group-based compensatory memory skills training, and waitlist control. Each intervention lasted six weeks. Blinded assessments occurred at baseline, post-intervention and at six weeks. The primary outcome measure was attainment of personalised memory goals using Goal Attainment Scaling. Secondary outcome measures include: neuropsychological measures of memory, subjective ratings of everyday memory failures, and self-reported strategy use. Preliminary results using a 3 x 3 mixed model ANOVA are presented. Results: 45 participants have competed scheduled follow-up to date. The compensation memory intervention group (n = 17) had significantly greater improvement in individualised, memory specific goal attainment at post and followup assessment relative to computer restorative (n = 14) and wait control participants (n = 14) (F (1.42) = 6.58, p = < 0.01, partial eta squared = .24). All groups self-reported reductions in everyday memory failures (F (2.72) = 7.47, p = £0.01, partial eta squared = .17) and improved strategy use (F (2.82) = 27.86, p = < 0.01, partial eta squared = 0.41) at post and follow up. Conclusion: These preliminary data indicate compensatory memory rehabilitation improved functional memory on individualised goals following stroke, while restorative computer based rehabilitation showed no significant effects compared with waitlist control. Updated results will be presented. Correspondence: *Toni Withiel, BSc (Hons), Monash University, Australia Unit 2 17 Zeising Court Boronia Victoria, 3155 Australia. toni.withiel@monash.edu*

Raskin S, Race M, Aiken E. A modular approach to personalized prospective memory training

We have created a series of prospective memory (PM) training modules to allow clinicians to individualize treatment according to the underlying cognitive loss that leads to the PM impairment. As PM is a multifaceted cognitive function, involving attention, planning, monitoring, working memory and retrospective memory retrieval; individuals can fail to successfully complete a task for different reasons. Our comprehensive training approach includes visualization, increasing attention to cue-intention relatedness, using enactment, increasing cue focality, increasing cognitive load, and time perception training. This study used a series of case studies in a crossover design to measure the specificity of each type of training for different individuals. Case studies (n = 20) of individuals with ABI and low scores on the Memory for Intentions Test (score < 20) were included. Each participant was scored on attention (Brief Test of Attention), retrospective memory (Hopkins Verbal Learning Test), planning (Tower of Hanoi) and time perception. Using the Memory for Intentions Screening Test (MIST) as the main outcome variable, intra and inter treatment analyses examined the effectiveness of individualized cognitive rehabilitation for improving PM in ABI. Individuals with poor attention benefited most from visualization training. Individuals with poor planning skills benefited most from training that increased cue-intention relatedness. Individuals with poor time perception benefited most from time perception training. Individuals with poor retrospective memory skills benefited most from enactment. Optimum training strategies for different individual cognitive profiles were suggested by the data and could be helpful in future treatment planning. Correspondence: *Sarah Raskin, PhD, Trinity College, 300 Summit Street, Hartford, United States. sarah.raskin@trincoll.edu*

Maes J, Zhao X, Xu Y, Fu J. Training and transfer effects of working memory updating training are modulated by achievement motivation

Previous studies examining effects of working memory updating training revealed mixed results. One factor that might modulate training gains, and the transfer of those gains to non-trained cognitive tasks, is achievement motivation. In the present Studies 1 (N = 49) and 2 (N = 45), students were divided into a high achievement motivation (HAM) and low achievement motivation (LAM) group on the basis of their score on the Achievement Motivation Scale. All students completed a 14-day visuospatial working memory updating training programme. In Study 2, the students also performed a set of tasks measuring other executive functions and fluid intelligence prior to, and after training. In both studies, the HAM students reached a higher performance level during training than the LAM students. Study 2 revealed that this differential training gain only transferred to better post-training performance on a numerical working memory updating task for the HAM compared to LAM students,

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reflecting a near-transfer training effect. These results support a modulatory role of achievement motivation on training and transfer benefits and might suggest ways to enhance the success of cognitive training programmes by first targeting the individual's cognitions regarding one's own cognitive capacities. Correspondence*: R. Joseph Maes, PhD, Donders Institute for Brain, Cognition and Behaviour Centre for Cognition Radboud University PO Box 9104 6500 HE. r.maes@donders.ru.nl*

Minder F, Zuberer A, Brandeis D, Drechsler R. Pre-training neuropsychological impairment of children and adolescents with ADHD is unrelated to treatment response after computerized cognitive training

Objective: Current meta-analyses find no convincing evidence for a general efficacy of cognitive training in ADHD. Considering that only a fraction of ADHD children shows cognitive impairment in neuropsychological measures, it might be possible that treatment effects of cognitive training would be more robust in a subgroup of ADHD children with neuropsychological deficits. Method: Children with ADHD (N = 31) participated in a computerized cognitive training of attention, working memory, and inhibition over 10 to 12 weeks. The group was divided into a high and low impairment subgroup based on a median split of the number of test scores, in which they scored in the clinical range. Cognitive tests were conducted pre- and post-training as assessment of near transfer effects. Parent and teacher ratings of ADHD symptoms served as measures of far transfer outcome. Results: Analyses revealed no interaction between pre-training performance and near-transfer outcome measures. Parent ratings of ADHD symptoms improved significantly after training; however, the improvement did not interact with pre-training impairment. Teacher ratings indicated greater improvement in the low impairment group compared to the high impairment group. Discussion: Contrary to the hypothesis, pre-training cognitive impairment did not predict better treatment response. It remains subject to further investigation, which subgroup of ADHD children benefit most from cognitive training. Correspondence: *Franziska Minder, PhD student University Hospital of Psychiatry Zurich, Eisengasse 16 Zurich. franziska.minder@kjpd.uzh.ch*

Poster Preseantation. Acquired Brain Injury Adult/Cognitive Rehabilitation 16:30-18:30

Nel K, Govender S. Concussive injury in university football players

The aim of the pilot study was to investigate the differential contact sport-related injuries contrasting contact sport (football) to non-contact sport (volleyball players) in terms of reaction time and concussive symptomology. Participants completed demographic questionnaires (which included a medical history), the Rivermead Post-Concussion Symptomology Checklist, to assess Post Concussion Symptomology (PCS) and the California Computerised Assessment Package (CalCAP) to assess Cumulative Mild Head Injury (CMHI) through differences or changes in reaction time. A purposive sample of football players (n – 15) and non-contact sports controls (n – 15) was utilised. Data were analysed using the Fisher Exact Test, descriptive statistics and the Chi-Square Test. The main findings of the study established that there was a small, significant change in terms of sequential reaction time on the CalCAP and that some post-concussive symptoms (PCS) persisted after an initial concussion in the football playing group. Results for 'improved' symptomology indicated that there was a small significant difference between the football and volleyball groups post season (p = 0.002), which suggested that chronic PCS may occur in football players. The findings suggest that interventions such as the use of appropriate headgear for vulnerable players may be necessary. The sample was small and purposive in nature thus results cannot be generalised. It is recommended that a larger, randomised study is undertaken in South Africa. Correspondence: *Kathryn Nel, PhD, University of Limpopo. Kathryn.Nel@ul.ac.za*

Jamieson M, Brewster S, Mcgee-Lennon M, Cullen B, Evans J. Developing ApplTree: A smartphone reminding app for people with acquired brain injury

Smartphone reminding apps can help people with acquired brain injury (ABI) to compensate for poor prospective memory. Difficulties with executive functioning and memory may make apps difficult to use. Therefore, the development of usable reminding apps could have a huge impact on the rehabilitation of prospective memory. We involved people with ABI living in the community to develop a bespoke reminding app (ApplTree). A prototype of ApplTree was tested along with Google Calendar – standard mobile reminding software – by 14 people with ABI in an experimental setting. Participants were asked to set six reminders for everyday tasks such as taking medication and attending doctors' appointments. Time taken to set these reminders and the errors they made were noted. Participants median time to enter a reminder was 370 seconds (6 minutes and 10 seconds) (Q1 = 260 seconds, Q3 = 548 seconds) with ApplTree and 362 seconds (6 minutes and 2 seconds) (Q1 = 299 seconds, Q3 = 498 seconds) with Google Calendar. On average, 2.98 (SD = 0.93) errors were made when entering a reminder into the phone using ApplTree and 3.36 (SD = 0.84) were made when using Google Calendar. Many errors observed would seriously impact the effectiveness of using a reminding app as a memory aid. For example, the most common error type was omitting important information such as the event title or notes, and many participants entered incorrect information including the wrong date and time. ApplTree was updated using this information to support reminder entry and a further field study with three participants offered insights into the factors that influence the use of a mobile phone as a memory aid during everyday life. We discuss the newest version of ApplTree along with practical and design issues clinicians might consider when recommending mobile phone apps in rehabilitation. Correspondence: *Matthew Jamieson, MA Msc PhD, Institute of Health and Wellbeing, University of Glasgow, Gartnavel Royal Hospital, 1055 Great Western Rd, Glasgow G12 0XH.*

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Odendaal A, Laidlaw C, Moodley N. Spaces for expression: Acquired brain injury in patients in rehabilitation

The benefits of art as a medium of expression have been explored by many researchers. In light of this, a space was created for patients admitted to the neurology and spinal wards at a government rehabilitation hospital, to enable them to express themselves using art as a stimulus. Many patients admitted here have suffered an Acquired Brain Injury such as a stroke, traumatic brain injury or disease that sometimes leaves them with speech and cognitive deficits. During their admission, patients receive physiotherapy, occupational therapy, speech therapy and various counselling or supportive therapies. Group psychotherapy is often required to address the emotional needs of the patients, and to highlight any individual emotional challenges. An expressive art therapy research project was conducted at the hospital with a group of six black male inpatients, between 25 and 65 years of age. The aim of the study was to improve the emotional healing of the patients by using art as a medium to access difficult emotions in order to effectively process them. A structured programme within a group context was used that included relaxation exercises and an art activity. The research method for this study is a qualitative phenomenological approach, through the use of observation and researcher and therapist reflection during the art programme and semi-structured interviews post the art programme. Through Interpretive Phenomenological Analysis, the study focused on the lived experiences of the inpatients, using art as a medium to express themselves. Correspondence: *Alison Odendaal, BA Honours, UNISA, PO Box 80493, Doornpoort, 0017 Hammanskraal, South Africa. alisonodendaal@gmail.com*

Zambrano-Páez D, Salvador-Cruz J. Neuropsychological impairment due to electrocution accident

Accidents caused by electrocution result in very well identified and reported physical and organic damages; however, there are also psychiatric, neurological and neuropsychological alterations, which have been less investigated, but also impact on the functionality and quality of life of people who are exposed to this type of injury. The present investigation reports the case of a 40-year-old woman who suffered an electrocution accident on April 2015, reporting experiencing cognitive difficulties in memory, performing arithmetic operations, mental fatigue and perceiving that "the mind goes blank"; neurological changes such as the presence of headaches and muscle weakness in the legs, as well as emotional changes such as increased irritability and frequent crying. A neuropsychological assessment was performed 11 months after the accident, using Mini Mental State Examination, PIEN Test Barcelona (Abbreviated Version), Artiola's Word List Test, Wisconsin Card Sorting Test, Rey-Osterrieth Complex Figure and Beck Depression Inventory. The results obtained evidenced difficulties in concentration, visual memory, working memory, reasoning and depressive symptomatology. These findings suggest the presence of both cognitive and emotional difficulties that affect both the social-emotional and functional performance and development, however, because this type of disease is not very common, it is necessary to document in detail the semiology and neuropsychological consequences, considering that very little is known about the neurophysiological mechanisms underlying these alterations. It is also suggested that long-term follow-up be carried out to know the evolution of the disease. Correspondence: *Diana Zambrano-Páez, Universidad Nacional Autonoma de México Prolongación Guadalupe Victoria #8, Colonia San Gregorio Atlapulco, C.P. 16600, Delegación Xochimilco, Ciudad de México, México. zampadi@hotmail.com*

Miller L, Granros M, Mewborn C, Gogniat M, Robinson T, Jean K. Dual driving and distractor task: Association with executive functions in older adults

Current research suggests that cognitive training may slow decline in attention, memory, and executive functions in older adults. Age-related decline is normal for both mildly cognitively impaired and healthy older adults. Executive functions are the skills necessary for organization, execution of goals, and inhibition of compulsory actions. Specifically, executive dysfunction demonstrates difficulty in multitasking activities of everyday life. To examine the relationship between executive functions and performance on a task representative of multitasking abilities, a sample of older adults (n = 20) trained on Neuroracer, a driving simulation task combined with a visual distractor task and customized to train, challenge and measure multitasking ability over 12 visits, completing 20 trials each visit. The training required participants to drive a vehicle on a road while periodically and simultaneously responding to interjected symbols on the visual screen. Difficulty level of each trial run changed specific to each participant using an algorithm that considered performance on previous runs. The Executive performance status of the participants was assessed using DKEFS subtests Verbal Fluency, Colour Word, and Trails as measures of executive function. Correlation revealed that average latency did not correlate with the DKEFS measures (-0.300, p = .106). However, DKEFS scores were significantly related to average driving accuracy (0.594, p = .004) and final difficulty level (0.507, p = .011). Findings suggest that successful multitasking may be dependent on executive functioning. Findings thus support the testing of multitasking interventions as tools for cognitive enhancement in older adults. Correspondence*: Lloyd Miller, PhD, University of Georgia, 110 Hooper Street, Psychology Bldg Rm 163, University of Georgia, Athens, GA 30605. lsmiller@uga.edu*

Dijkerman C, Van Stralen H, Biesbroek M, Kuijf H, Van Gemert M, Sluiter D, Kappelle J, Van Zandvoort M. The relation between somatosensory deficits and left right orientation impairments after stroke: A voxelbased lesion symptom mapping study

Introduction: Being able to distinguish between the left and right side of the body is important for many aspects of our daily life functioning. In the current study, we investigated

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whether somatosensory related deficits, ranging from primary somatosensory impairment to body representation impairment affects left right orientation (LRO), in patients who recently suffered a stroke. We also examined which brain areas are associated with LRO impairments using a Voxel-based Lesion Symptom Mapping analysis. Methodology: 47 first-ever stroke patients and 48 age-matched healthy controls were assessed. LRO was tested with the Bergen Right Left Discrimination Test (BRLD). Impairments on primary somatosensory function (tactile perception, proprioception), higher order somatosensory function (finger recognition, subjective experience of body ownership) and other cognitive functions (language, attention and working memory, visuospatial neglect) were entered as predictors in a logistic regression analysis. Outcome measures consisted of the BRLD-total performance, which was further subdivided in performance for 1) first person perspective stimuli, 2) third person perspective stimuli, 3) alternating between first and third person perspective Results: Impairments on BRLD total performance were predicted by impairments in finger agnosia and visuospatial neglect. For items placed in third person perspective, performance was predicted by body representation impairments; finger agnosia and the subjective experience of body ownership. VLSM analysis showed a significant association between LRO impairments and damage to the right insular cortex. Conclusion: The results suggest that the somatosensory system is important for LRO. Furthermore, the results indicate that an affected body representation may hinder adopting a third person perspective that may subsequently also lead to LRO impairments. The right insular cortex appeared crucially involved in these processes. Correspondence*: Chris Dijkerman, PhD, Utrecht University. h.c.Dijkerman@uu.nl*

Friday, 07 JULY 2017

Symposium. HIV Infection in Children and Adolescents: Neuropsychological and Demographic Profiles and Assessment Chair: Leigh Schrieff-Elson 08:00-10:00

Phillips N, Thomas K, Stein DJ, Hoare J, Myer L, Sackort N, Zar HJ, Hoare J. HIV-associated cognitive impairment in perinatally infected children and adolescents: Validation of a quick screening tool

Perinatally acquired HIV infection has adverse neurocognitive consequences for children living with the virus. To date, there are no screening tools to determine the risk of HIV-associated cognitive impairment in this vulnerable cohort. We sought to test and validate the use of the International HIV Dementia Scale (IHDS) as a screening tool for risk of HIV-associated cognitive impairment in a sample of perinatally HIV-infected children drawn from the Cape Town Adolescent Antiretroviral Cohort. Each participant completed a comprehensive neuropsychological test battery and the IHDS as part of their participation. Using the following cut-off scores on the IHDS (i.e. > 10 = no risk, 10-8 = moderate risk and < 8 = high risk), the following analyses were performed: 1) a T-test that demonstrates a significant difference in cognitive ability between HIV-infected children and controls scoring above 10 on the IHDS and those scoring less, the same was true for the HIV-infected group alone, 2) a simple bivariate correlation between the IHDS and cognitive ability, which demonstrates that as cognition improves so do scores on the IHDS (i.e. better cognitive ability is associated with higher scores on the IHDS), 3) a cross tabulation sensitivity analysis, which revealed that the IHDS yields more true positives than false positives. Preliminary analysis of the usability of the IHDS revealed that this tool could be useful as a validated screen for neurocognitive impairment in perinatally HIV-infected children. A validated quick screening tool for use in this vulnerable population will be valuable in low resources settings such as South Africa. Correspondence *Nicole Phillips, MSocSci*, *University of Cape Town, PO Box 397 Kuilsriver 7580, Cape Town, South Africa. nicole.phillips@uct.ac.za*

Phillips N, Myer L, Hoare J, Stein D, Thomas K, Zar H. HIV-associated cognitive impairment in perinatally infected children and adolescents: Introducing the composite cognitive domain score

Assessment of HIV-associated cognitive impairment in perinatally infected children and adolescents is challenging. Assessments of general intellectual functioning, or global cognition, do not provide information regarding domain-specific strengths and weaknesses, and may therefore fail to detect impaired trajectories of development within particular cognitive domains. A child-sensitive method for examining domain-specific patterns of HIV-associated cognitive impairment is needed. We describe and test a novel method for this purpose. The method involves (1) determining, using statistical measures of association, which individual neuropsychological test measures might best be combined to form composite domain scores, (2) assessing which source of data (uninfected controls, or controls plus patients) might be best to use in calculating standard scores for the composite domains. Once those domains are comprised, they might capture the range of HIV-associated cognitive impairment in individual children, or in groups of infected patients. We illustrate the value of this method by comparing the efficacy of global cognitive scores to that of composite cognitive domain scores in detecting HIV-associated cognitive impairment in a sample of perinatally HIV-infected children, and a demographically matched control, drawn from the Cape Town Adolescent Antiretroviral Cohort. We recommend using this method of composite domain scores, rather than global aggregate scores, when assessing cognitive function in pediatric HIV. This method provides a convenient, standardized, and relatively accurate assessment that researchers across all settings and contexts might use. Ultimately, employing the method might help cross-cultural and cross-region comparisons as researchers try to detect cognitive impairment patterns in HIV-infected children and adolescents globally. Correspondence: *Nicole Phillips, MSocSci, University of Cape Town, PO Box 397 Kuilsriver 7580, Cape Town, South Africa. nicole.phillips@uct.ac.za*

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Mokoena L, Schrieff-Elson L, Donald K, Malcolm-Smith S, Davids N, Walker K. HIV-related referrals to a local pediatric neuropsychology clinic: A 1-year demographic (including medical, developmental, and academic) and neuropsychological profile

Until recently South Africa had no formal registration category for neuropsychologists. In 2011, the Health Professions Council of South Africa (HPCSA) added neuropsychology to the scopes of practice for professional psychologists and subsequently certain South African universities developed neuropsychology masters training programmes. Currently there are no professionally registered neuropsychologists as the register remains inactive. Registration in the professional psychology categories requires a one-year internship – these are currently not available for neuropsychology. A need thus exists to develop a neuropsychology internship. At 1 Military Hospital, the clinical psychology internship programme includes a 6-month rotation in the Neuro-Rehabilitation ward, which provides training and supervision in neuropsychological assessment, report writing, clinical interviewing, and therapy within a multidisciplinary context. This study evaluated the common categories of clients encountered during this rotation and qualitatively explored the experiences of interns during this rotation as a first step towards developing a neuropsychology internship. Fifty-two (n = 52) clients were admitted over a year. The majority experienced cardiovascular incidents (44%), while 31% were traumatic brain injuries, and 25% other types of brain ailments. Thematic content analysis of the interns' experiences highlighted the common challenges while working with each client. Findings suggest that the development of a neuropsychology internship programme requires a sound theoretical background of neuropsychology, training in assessment and report writing. However, in addition, an emphasis on core therapeutic competencies may assist neuropsychologists to navigate the intricacies of working in a diverse African context where assessments alone may not provide a clear picture of a client's fallouts, needs and clinical progression. Correspondence: *Limpho Mokoena, MA in Neuropsychology (currently), Department of Psychology, University of Cape Town, 129 Main Road, Observatory, Cape Town, 7935. mokoena.limpho3@gmail.com*

Paper Presentations. Adult Assessment 08:00-10:00

Douglas G. Use of adaptive behaviour assessment in a South African psycho-legal context

The use of the Vineland Adative Behaviour Scales is presented in a context of providing access to justice for a group of adults, adolescents and children with intellectual disability. The sample includes 642 individuals between 2005 and 2013 who were complainants in sexual abuse cases from Cape Town and the surrounding rural areas. Findings will be presented regarding the usefulness of the adaptive behaviour assessment in evaluating competency as a witness, particularly its use cross-culturally. Proposed use for people with acquired brain injury will be posited and a brief review of the newly published Vineland-3. Correspondence: *Douglas Gillian, MA (Clin Psych), 8 Rose Street, Newlands 7700 Cape Town. gilldouglas@mweb.coza*

Ponds R, Dandachi-FitzGerald B. A factorial examination of the SIMS subscales in a large patient sample

The Structured Inventory of Malingered Symptomatology (SIMS) is a self-report questionnaire designed to screen for symptoms of both feigned psychopathology and cognitive function. The SIMS consists of 75 dichotomous (yes/no) items. These items can be grouped in 5 subscales representing malingered symptoms in several domains: low intelligence (LI), affective disorders (AF), neurological impairment (NI), psychosis (P) and amnestic disorders (AM). These subscales were originally based on interrater agreement between psychologists. In addition, construct validity of these subscales was examined in a simulation design with healthy undergraduate students but this was never cross-validated in patientgroups. We present data on the SIMS factor structure in a large pooled sample (N = 743) of Dutch patients with either psychiatric or somatic complaints who were referred for regular (neuro)psychological examination. One out of five patients (N = 158) had a score above the cut-off score (> 16). Preliminary findings question the construct validity of the SIMS subscales. Correspondence: *Ponds Rudolf, PHD, Maastricht University Medical Center, Head of the Department of Medical Psychology, PO Box 5800 6202 AZ, Netherlands. r.ponds@maastrichuniversity.nl*

Agelink Van Rentergem J, de Vent N, Schmand B, Murre J, Huizenga H. Aggregate normative databases in clinical neuropsychology

Almost all neuropsychological tests are stand-alone instruments. However, many diseases and disorders are characterized by unique patterns of deviations on multiple tests. Therefore, deviations on tests are best interpreted in light of performance on other tests. For example, a poor performance on delayed recall tests may be especially relevant when considering a patient with high scores on immediate recall and fluency tests. In order to capture this information, the whole profile of a patient's test scores needs to be considered, in a multivariate normative comparison. The statistical method for such multivariate normative comparisons has recently become available, but the required multivariate normative data have not. In this presentation, we propose to establish multivariate normative datasets by aggregating control group data from neuropsychological studies. This is the solution that we chose for the Advanced Neuropsychological Diagnostics Infrastructure (ANDI) project. However, this solution brings with it a number of difficulties, in terms of variation in test scores between studies, and in terms of missing data. We show how we resolved these difficulties, and show how a multivariate evaluation of a patient's profile proceeds, given such an aggregated normative dataset. We also discuss how multivariate comparisons can address questions in the diagnostic process that univariate comparisons cannot. Correspondence: *Joost Agelink van Rentergem, PHD*

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Robbins R, Scott T, Gouse H, Joska J. Alternative facts: The dilemma of adjusting and interpreting test results with a small normative sample in South Africa

Objective: Neuropsychological (NP) testing in resource-limited settings (RLS) with populations for whom few NP tests exist typically rely on very limited normative samples. This poses challenges in how to interpret test results. Should adjustments be made for gender, age, and education – all factors known to influence test performance – even if those adjustments further diminish the normative sample size? Similarly, many neuropsychologists use global deficit scores (GDS) to characterize overall test performance, yet guidance on how to generate GDS is limited. Should every test score be included in the GDS or only select ones? To highlight how interpretation of performance changes depending on the norms and GDS algorithm used, we present unadjusted NP test performance data from HIV+, isiXhosa-speaking South Africans, as well as results from multiple GDS algorithms. Methods: One hundred and two HIV+, isiXhosa-speaking South Africans completed a NP test battery. Adjusted and unadjusted T-scores were generated from a normative sample of 114 isiXhosa-speaking South Africans who had no major medical, psychiatric or neurological problems. GDS were calculated using four different algorithms. Results: Depending on the test and which adjustment is made, normed T-scores can vary as much as 20 points for the same individual. Similarly, depending on which GDS algorithm is used, individual GDS can vary greatly. Conclusion: Neuropsychological testing in RLS faces unique challenges in norming and interpreting test results. Without clear guidance, test performance is easily misinterpreted. Robust local norms are needed for use with populations in RLS, as are guidelines and methods to generate and use them. Correspondence: *Robbins Reuben, PhD, Columbia University and New York State Psychiatric Institute, 1051 Rivderside Drive Unit 15, New York. rnr2110@cumc.columbia.edu*

Ponds R, Dandachi-FitzGerald B. On the limits of symptom validity tests

Objective: Symptom Validity Tests (SVTs) are used for classification of credible versus non-credible cognitive test performance and symptom reporting. Cognitive dysfunction and apathy may interfere with SVT performance, leading to false positive SVT outcomes. We examined 1) the false positive rate of SVTs in patients with AD and Parkinson's Disease, and 2) the relation between SVT performance and cognitive functioning and apathy. Methodology: Cross-sectional, between subjects-design. 138 neurological patients were included; 97 patients with mild cognitive impairment due to AD, and 41 patients diagnosed with Parkinson's Disease (PD). The neuropsychological examination included three SVTs: Test of Memory Malingering (TOMM), Dot Counting Test (DCT), and the Structured Inventory of Malingered Symptomatology (SIMS). Global cognitive functioning was measured with the MMSE. Apathy was determined with the Apathy Evaluation Scale (AES). Results: For the total sample, the failure rate was: 13.7% for the TOMM trial 2 (score < 45), 10.1% for the SIMS (score > 19), and 5.7% for the DCT (score < 22). While 14 patients (13.5%) failed one SVT, only 2.9% failed two SVTs, and none failed all three SVTs. Correlational analyses show that the MMSE total score was significantly related to performance on all three SVTs. The AES total score was significantly associated with TOMM and SIMS scores but not with DCT performance. Also, the MMSE and AES were significantly associated. Regression analyses will be performed to determine the relative contribution of cognition and apathy to SVT performance. Conclusion: One SVT failure is not uncommon in patients with neurodegenerative diseases. SVT performance is associated with both cognitive functioning and apathy. However, the majority of patients still performed in the normal range, and when applying the decision rule that at least two SVTs need to be failed for the determination of non-credible test performance, the specificity remains high (i.e. 97%).Correspondence: *Ponds R, PHD, Maastricht University Medical Center, Head of the Department of Medical Psychology, PO Box 5800 6202 AZ, Netherlands. r.ponds@maastrichuniversity.nl*

Symposium. Social Cognition Across the Lifespan: New Advances in Clinical Assessment and Theory
Chair: Skye McDonald
08:00-10:00

McDonald S, Hazelton J, Padgett C, Allen S, Honan C, Kumfor F, Piguet O. The awareness of social inference test-S: A screening test for social cognition: Comparing Australian and US speakers

Background: It is increasingly recognised that social cognition should form part of our cognitive and communication assessments of people with brain disorders. The Awareness of Social Inference Test (TASIT) uses naturalistic videos to assess emotion perception, theory of mind and understanding of pragmatic inference (such as sarcasm). While widely used, TASIT is lengthy to administer. We recently developed a short version based on Rasch analysis with 10, 9 and 9 items for Parts 1, 2 and 3, respectively. In this paper, we report on normal adult performance on TASIT-S, comparing USA and Australian speakers. Method: 181 USA speakers (mean age 35) completed TASIT-S online (via mTurk). Their performance was compared to 161 Australian speakers (mean age 38) who were administered TASIT-S face to face. An additional 65 Australian adults were included to examine the effects of age on performance. Results: USA speakers performed slightly better on emotion recognition and judging sincere items than Australians. Australians were slightly better detecting lies but overall performance across cultures was comparable. Australians aged over 60 (mean age 68) were uniformly poorer than younger adults (mean age 36) on all parts of TASIT-S. There was no effect of gender. More educated adults performed better on TASIT-S part 2. Conclusions: Despite having to understand actors with Australian accents,

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this study shows that USA speakers perform comparably to Australians. The main influence on TASIT-S performance was age and, to a less extent, education. These norms provide a useful framework for using TASIT-S in clinical settings. Correspondence*: Skye McDonald, PhD, University of New South Wales, Psychology, UNSW, Sydney, 2052, NSW, Australia. s.mcdonald@unsw.edu.au*

Kumfor F, McDonald S, Hodges J, Piguet O. Employment of a short clinical test to assess social cognition in younger-onset dementias

The differential diagnosis of behavioural-variant frontotemporal dementia (bvFTD) and Alzheimer's disease (AD) is clinically challenging, as both syndromes can present with executive dysfunction and episodic memory impairment. Importantly, changes in behaviour, personality, motivation and social skills are hallmark features of bvFTD, yet tend to be relatively preserved in AD. Thus, assessment of social cognition has been increasingly recognised as central in distinguishing bvFTD and AD. Valid and clinically appropriate tests with known neurobiological correlates, however, are lacking. Here, we investigated performance on a newly devised short version of The Awareness of Social Inference Test (TASIT-S) and associated neural correlates in 25 bvFTD, 23 AD and 25 healthy controls. On Part 1 - Emotion Evaluation, only bvFTD were impaired after controlling for cognitive impairment and education ($p = .033$) (AD vs controls: $p = .475$). On Part 2 - Social Inference, both bvFTD and AD showed intact ability to interpret sincere exchanges (p values >.05). Importantly, however, bvFTD were impaired in interpreting sarcasm ($p = .008$), whereas AD performed within normal limits ($p = .477$). Voxel-based morphometry analyses demonstrated correlations between Part 1 and integrity of emotion processing brain regions (amygdala, insula, fusiform) and Part 2 with theory of mind brain regions (precuneus, temporal pole). These results demonstrate the utility of TASIT-S in identifying social cognition impairment in dementia and that TASIT-S taps into integrity of the "social brain". Importantly, these results reveal that TASIT-S may help in identifying patients with bvFTD and therefore should be incorporated into assessment batteries where this diagnosis is suspected. Correspondence: *Fiona Kumfor, PhD, University of Sydney. fiona.kumfor@sydney.edu.au*

Rushby J, De Blasio F, Dalton K, Kornfeld E, McDonald S. Impaired alpha responsivity to angry facial expressions is related to volume loss in limbic structures in severe traumatic brain injury

Background: A large body of research shows that people with severe traumatic brain injury have impaired psychophysiological responsivity to emotional expressions in others, with negative emotions being more impaired than positive. This study examined whether injury-related brain volume loss in key limbic system structures is associated with these deficits. Methods: 24 adults (19 male, age 46.9, SD = 13.7), who had sustained a TBI, and 24 age and gender matched healthy controls participated. A magnetic resonance imaging (MRI) scan established bilateral insulae, thalami, amygdale and hippocampi volumes. Mean EEG alpha power was recorded while participants viewed repetitions of happy and angry facial expressions. Results: Significant volume loss was found for the TBI group for all structures examined. Alpha power was lower in frontal and midline regions in TBI compared to control participants, and this reduction was larger for angry than happy faces. Insulae volume correlated with alpha power to both expressions in control participants, but neither for TBI. Thalami and amygdale volume correlated with alpha power in frontal/central regions to both expressions across groups, but between group differences, showed that these relationships were weaker overall, and not significant for the right amygdala with alpha responsivity to angry faces, for the TBI group. Conclusions: In line with previous research, people with TBI showed impaired responsivity to angry facial expressions, and this was related to volume loss in key limbic structures, suggesting an impairment within the ventral frontal neural system that mediates automatic orientation to emotionally significant stimuli. Correspondence: *Jacqueline Rushby, PhD, University of New South Wales, PO Box 6355UNSW, Sydney, 1466, Australia. j.rushby@unsw.edu.au*

Wearne T, McDonald S. Understanding the emotion of others: Evaluating the unique contribution of facial expressivity and subjective emotional experience in the recognition of emotion

Background and aims: The ability to recognize how others feel is crucial in a variety of social situations, with difficulty recognizing emotion commonly reported in traumatic brain injury. In this study, we tested whether problems identifying emotion in others is related to problems expressing or feeling emotion in oneself. This links to theories of emotion perception that suggest we simulate expressions in ourselves as a means to understand it. Method: Individuals with a brain injury (n = 27) and controls (n = 28) were tested on an emotion recognition task of happy, sad and angry faces. We then asked participants to adopt a facial expression according to the presentation of happy, sad and angry stimuli (photos, words and stories) and asked them to rate their subjective experience of anger, sadness and happiness. Facial expressivity was coded via judges' ratings. Results: Using hierarchical regression analyses, results showed that subjective emotional experience was a unique predictor of emotional recognition for happy, sad and angry facial expressions, while facial expressivity did not significantly contribute to the predictive power of regression models. Furthermore, across all emotions, cognitive ability and the experience of emotion from a story mostly predicted the recognition of emotion. Conclusions: The ability to identify emotion in others depends on the subjective experience of that emotion and not on the ability to express that emotion in oneself. Furthermore, emotion perception depends on the context in which emotion is experienced. Correspondence: *Travis Wearne, PhD, University of New South Wales, 1309 Mathews Building, University of New South Wales, Australia. t.wearne@unsw.edu.au*

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McDonald S, Anderson V, Hearps S, Turkstra L, Dooley J, Darby D, Beauchamp M, Hearps S. Evaluating social competency using PEERS with paediatric clinical populations

Background: Mature social skills are necessary for rewarding relationships and vital to quality of life across the lifespan. Social skills deficits, e.g., emotional self-regulation and social problem solving, are hallmark outcomes after pediatric traumatic brain injury (TBI). However, there are currently no comprehensive, ecologically valid assessments of paediatric social competency with large normative data, limiting tailored remediation for specific social weaknesses. The Pediatric Evaluation of Emotions Relationships and Socialization (PEERS) is designed to address these gaps in paediatric social skills assessment. Methods: We compared the social profiles of our standardization date (n = 500) to a subgroup of children aged 4-18 years with neurological and developmental conditions (TBI, neurotoxic cancer treatment, autism spectrum disorder [ASD], attention deficit/ hyperactivity disorder [ADHD], learning disability [LD]). All participants completed some PEERS subtests along with IQ assessment from June 2016 – June 2017. Parent report of medical and developmental history, and social behaviour was also collected. Age and sex-based standard scores were derived using data collected from typically developing controls (TDC) in a large-scale standardization study. Results: Compared to TDC, the clinical groups displayed weaknesses in various social domains. Specifically, the TBI, ASD and LD group in social cognition and social communication domains, and the ADHD group in the attention/executive domain. The cancer group performed similarly to TDC. Conclusions: Preliminary data suggest that PEERS is useful to characterise social strengths and weaknesses in paediatric populations with neurological conditions, helping guide clinical decision making and intervention efforts. Further investigations using larger sample sizes, and additional clinical paediatric populations is warranted. Correspondence: *Skye McDonald, PhD, University of New South Wales, Psychology, UNSW, Sydney, 2052, NSW, Australia. s.mcdonald@unsw.edu.au*

Paper Presentations. Acquired Brain Injury 08:00-10:00

Shiel A, Pundole A, Wilson C, Rose A, Zimmerman CNR, Wilson B, Dhamapurkar S. Disorders of consciousness: Differences in behaviours recorded on the Wessex Head Injury Matrix between those with traumatic and nontraumatic aetiologies

The Wessex Head Injury Matrix (WHIM) was designed to assess people in the acute stage of recovery from severe Traumatic Brain Injury (TBI). In recent years, its use to assess and monitor people in Prolonged Disorders of Consciousness (PDoC) has increased. Many of these people did not have a TBI and none are in the acute stage of recovery. The aim of this study was first to investigate if people in PDOC demonstrate the same sequence of recovery as those with acute TBI and secondly to establish whether there are differences between people in PDoC following TBI and Acquired Brain Injury (ABI) from other aetiologies. A retrospective analysis using records from patients assessed in three centres was carried out. Nine records were excluded as aetiology was not specified and 67 cases were included in the analysis. There were 867 assessments in total as multiple assessments had been carried out with a mean number of assessments of 8.7 per case. There were 30 cases with TBI and 37 with ABI. Results indicated 1) there is a difference between the original sequence of behaviours and the sequence recorded for both groups and 2) there is a difference between TBI and ABI groups. This suggests that while the WHIM is an appropriate tool to assess people in PDoC, the sequence for both groups is likely to be different to the published scale and to each other. Correspondence: *Agnes Shiel, PhD, MSc, DipCOT, Aras Moyola NUI Galway, NUI Galway, Ireland. agnes.shiel@nuigalway.ie*

O'Breirne E, Sullivan L, Shiel A. Parents and PE teachers' knowledge of and attitudes towards sports-related concussion in Irish adolescents

There was a 41% increase in the number of 14-18-year olds reporting to hospital with head injury in an Irish centre between the 2012/12 and 2013/14 sporting seasons. This study investigated parents' and PE teachers' knowledge of and attitudes to sports-related concussion. A cross-sectional survey design using the Rosenbaum Concussion Knowledge and Attitude Survey was used to assess knowledge and attitudes to concussion. The RoCKAS generates a Concussion Knowledge Index (CKI) and Concussion Attitude Index (CAI). There were 262 valid responses from parents and 159 from teachers. Results indicate that while both groups have a basic understanding of concussion there are significant gaps in knowledge. CKI scores for parents ranged from 39-75, and CAI scores from 12-25. CKI scores for PE teachers ranged from 12-25 and CAI scores from 48-75. Both groups demonstrated safe attitudes towards concussion. There were significant gaps in knowledge: 52% of parents and 53% of PE teachers reported that symptoms of a concussion are not usually completely gone after 10 days; 73.6% of parents and 76% of PE teachers reported that after a concussion, people can forget who they are and not recognise others but be perfect in every other way. This study identified specific gaps in knowledge, particularly in relation to signs and symptoms, mechanism of injury and risk factors for concussion. Educational intervention may be used to improve knowledge in relation to concussion to facilitate safe and effective concussion management practices. Correspondence*: Ellen O'Beirne, NUI Galway. ellenobeirne@hotmail.com*

Ponsford J, Downing M, Nguyen S. Persistent post-concussion symptoms following mild traumatic brain injury in adults: Their nature and predictors

Background: There is debate regarding causes of persistent symptoms following mild traumatic brain injury (mTBI). Information provision regarding expected symptoms and suggested management strategies is arguably important but not routinely provided and there is limited evidence regarding its impact. Objectives: This study examined persistent symptoms, anxiety levels and quality of life and

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factors associated with persistent symptom reporting an average 7 months after uncomplicated mTBI, including the effects of receipt of information about mTBI in the Emergency Department (ED). Method: 343 individuals with mTBI completed the Rivermead Post-Concussion Symptoms Questionnaire (RPQ), Anxiety scale of the Hospital Anxiety and Depression Scale, and Quality of Life – Short Form (QoL – SF-12) scale at approximately 7 months post-injury (SD = 38.5 days). Results: Overall, 18.7% of participants reported three or more post-concussional symptoms (PCS). Fatigue was the most commonly reported post-injury symptom (17.2%), followed by forgetfulness (14.6%). Clinically significant anxiety was reported in 12.8% of the sample and was associated with PCS symptom reporting, as were SF-12 mental and physical QoL. Significant predictors of PCS reporting at follow-up were the presence of pre-injury psychological issues, experiencing loss of consciousness (LOC), and having no recall of receiving information about mTBI in the ED. Conclusions: This study confirms that LOC, together with pre-injury psychiatric issues may be associated with persistent PCS. Not receiving mTBI information in the ED may also negatively influence symptom reporting. Correspondence: *Jennie Ponsford*, *PhD, Monash University. jennie.ponsford@monash.edu*

Mbakile-Mahlanza L, Manderson L, Ponsford J. Family caregiving of individuals with traumatic brain injury in Botswana

Background: The impairments that affect survivors of TBI impact the person's independence, and family members frequently have to take on a caregiver role. This study examined the experience of caregiving for individuals with TBI in Botswana and its impact on psychological distress in caregivers. Methods: Using a mixed methods study design, qualitative data from semi-structured interviews was thematically analysed and triangulated with data regarding functional status from the Structured Head Injury Outcome Questionnaire and the Hospital Anxiety and Depression Scale (HADS). Results: The study included 26 participants with moderate to severe TBI, and a total of 18 caregivers were recruited. Caregivers commonly reported receiving limited information regarding their relatives' injuries and management methods. Heavy caregiving demands were placed on them, with little support from the healthcare system. A significant proportion of caregivers experienced anxiety and depression, which was associated with lower functional independence in their injured relative. Somewhat more spouses than parents reported clinically significant anxiety levels. Other consequences of caregiving included social isolation and limited support from the wider community, as well as financial difficulties. Despite these stresses caregivers tended to accept their caregiving role. Cultural factors such as devotion to their families and faith and belief in God moderated burden and distress. Conclusions: Carers of individuals with TBI in Botswana face significant challenges. Rehabilitation efforts need to take these into account. Specifically, more information and support needs to be provided to survivors and their families. Psychological, economic and health needs of the care providers also should be addressed in the planning of rehabilitation interventions. Correspondence: *Lingani Mbakile-Mahlanza, PhD, PO Box 70144 Gaborone, Botswana. lingani101@gmail.com*

Lefebvre G, Chamard E, Theoret H, DeGuise E. Multimodal evaluation of repeated subconcussive blows to the head in contact sport athletes

Objective: Recent studies have shown long-term structural and metabolic alterations after sport-related concussions. The present study aimed to verify if repetitive subconcussive blows to the head can induce similar impairments in university-level contact sports athletes, without history of concussion. Methods: Three groups were studied: NA: healthy non-athletes (N = 24); A-NCS: non-contact sport athletes (swimming; N = 24) and A-CS: contact sport athletes (rugby, soccer; N = 24). All participants had no history of concussion. They were recruited for a cognitive evaluation and a single magnetic resonance imaging session including magnetic resonance spectroscopy (MRS) of the left primary motor and prefrontal cortex, diffusion tensor imaging (DTI), susceptibility-weighted imaging (SWI), and anatomical MRI. Results: Analysis of variance revealed significant modulation of anisotropic values in motor-associated white matter paths in the A-NCS group compared to both other groups. Significantly higher myo-inositol levels in M1 (f (2.71) =3 .760, p = 0.029) were found in the A-CS group compared to both control groups. In the prefrontal cortex, significantly higher concentrations were found for GABA (f (2.71) = 4.32, p = 0.017) and Glx (f(2.71) = 3.15, p = 0.049) in the A-NCS group compared to the A-CS group, with no difference across all other groups. No group effect was found for cortical thickness, cerebral microbleeds and neuropsychological test scores. Conclusion: The present study suggests that contact sports athletes show microstructural and metabolic profiles very similar to those of non-athletes and differ from athletes involved in non-contact sports. Thus, repeated subconcussive blows to the head may hinder the beneficial effects associated with physical activity. Correspondence: *Geneviève Lefebvre, BSc (PhD student), Department of Psychology, University of Montreal, Pavillon Marie-Victorin 90, Avenue Vincent d'indy, Montreal (Quebec) H2V 2S9, C.P. 6128, succursale Centre-ville Montréal (Québec) H3C 3J7 CANADA. genevieve.lefebvre.10@umontreal.ca*

Wiseheart R, Wellington R. Reliability and sensitivity of dyslexia self-report in college student athletes: Implications for concussion/mTBI research

Background: Dyslexia is a modifying factor for concussion, but the precise relationship between dyslexia and concussion risk is inconclusive. To forward this research, it is necessary to establish feasible and valid methods for identifying student athletes with dyslexia. This study tested the reliability and sensitivity of self-reporting dyslexia on baseline neuropsychological (NP) testing against a more rigorous dyslexia screening protocol. Participants and methods: Participants were 58 student athletes from an American NCAA Division 1 university. The screening protocol comprised two previously validated dyslexia symptom inventories and two rapid automatized naming (RAN) tests.

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The Test of Word Reading Efficiency (TOWRE) was used as an outcome measure. Baseline ImPACT data was also available for 36 students. Results: Reliability between the two dyslexia inventories was good (α =.88). However, there were no significant associations between the inventories and NP testing, except for a moderate correlation with the reaction time composite (r .39, p < .05). Correlations between the inventories and reading outcomes were also ns. Eight athletes scored below the 16th percentile on the TOWRE. However, none of our athletes endorsed a previous dyslexia diagnosis at baseline, so sensitivity of self-report on the ImPACT could not be calculated. For the inventories, the positive predictive value (sensitivity) of endorsing reading difficulties subsequently identified on the TOWRE was poor (.125) compared to the sensitivity of the RAN (.75). A hierarchical regression also showed RAN significantly predicted reading, B = -0.60, t(54) = -6.97, p < .001, whereas the dyslexia inventories did not; B = -0.10, t(54) = -1.08, p = .284. Conclusion: These preliminary findings suggest that self-reporting dyslexia on the ImPACT is both unreliable and inaccurate. Responses on the dyslexia inventories were more reliable, but nevertheless inaccurate. A worrisome implication is that concussion research studies relying on self-report measures for group assignment are inadvertently including dyslexic students in control groups. Correspondence: *Rebecca Wiseheart, PhD, St Johns Univeristy, 8000 Utopia Parkway, Queens, United States. wiseheart@stjohns.edu*

Poster Presentations. Aging/Dementia (AD)/Dementia (Non-AD) and Mild Cognitive Impairment
08:00-10:00

Halliday D, MacDonald S, Stawski R. Inconsistency in finger tapping as a domain-specific proxy for CNS integrity in older adults

Response time inconsistency (RTI) in cognitive behavioural performance confers measurement sensitivity beyond that obtained through measures of central tendency and has been linked to deleterious health outcomes including disease, dementia, and death. Although implicated as a proxy of CNS integrity, RTI estimates may be confounded by additional sources of variance (e.g., practice effects) that need to be controlled to circumvent spurious findings. Commonly employed approaches include statistically partialling for mean group differences or within-person changes and their higher-order interactions. An alternative approach is to use a measure that minimizes higher-order cognitive demands and typically-accompanying confounds, yet remains sensitive to CNS function, such as the finger-tapping task. In this study, we examined short- (week-to-week) and long-term (year-to-year) changes in finger tapping RTI with the time-varying covariation of psychosomatic (pain), affective (positive and negative), physical (peak flow and grip strength) and cognitive (working memory) functioning using a longitudinal burst design over four years in three groups of older adults (64-92 years old); controls (n = 162), cognitively-impaired-not-demented (CIND)-unstable (n = 55) and CIND-stable (i.e., consistent across two years) (n = 45). Findings indicated that the magnitude of coupling between finger tapping RTI with working memory (γ = -6.64, p < .05) and grip strength (γ = -0.14, p < .05) was greater in the CIND-stable individuals, relative to controls. On occasions when CIND-stable individuals were more variable in tapping, they were slower and exhibited less grip strength. These patterns suggest that RTI in finger tapping latency may be a sensitive indicator of cognitive status and CNS integrity, with the potential for use in clinical settings. Correspondence: *Drew Halliday, MSc, Psychology, University of Victoria, Department of Psychology, University of Victoria, PO Box 1700 STN CSC, Victoria, B.C. V8W 2Y2. drewh@uvic.ca*

Mograbi D, Bertrand E, Silva R, Cheniaux E, Dourado M, Laks J, Morris R. The relationship between mood disorder and awareness in dementia and bipolar disorder: Clinical and empirical evidence

Lack of awareness about having a disease and its consequences, also termed anosognosia or loss of insight, is a common feature of a number of neurological and psychiatric conditions. One frequent observation is that awareness is associated with alterations in mood. For example, depressed mood is linked with increased awareness, while manic disorder is associated with less awareness. In this talk, clinical evidence supporting this association will be discussed, with empirical data obtained from patients with Alzheimer's disease and bipolar disorder being presented. Data from three correlational and three experimental studies conducted with these patients will ground a discussion about potential causal mechanisms for the association (and dissociation) between awareness and mood change. The findings will be discussed in relation to theoretical models of awareness, with future directions for this area of research and clinical implications being explored. Correspondence: *Daniel Mograbi, PhD, PUC-Rio/KCL, R. Marques de Sao Vicente, 225 Daniel, Rio de Janeiro, Brazil. mograbi@kcl.ac.uk*

Jutten L, Mark R, Sitskoorn M. When does informal caregiving for people with dementia result not only in burden but also in gains?

Caregiver Burden is common among informal caregivers of people with dementia (ICs). However, some find caregiving meaningful and life-affirming. This positive side of caregiving has been referred to as Caregiver Gains (CG). When factors predicting CG are known, interventions focused on optimizing ICs well-being could be more tailored. Objective: To assess which factors (ICs sociodemographic, (neuro)psychological, and patient-characteristics), are associated with (and predict) CG. Participants and methods: 191 ICs individually completed a semi-structured interview, three neuropsychological tasks (letter and category fluency and WMS-III Logical Memory), and six questionnaires. Correlations (Spearman's ρ) were calculated to evaluate which variables correlated significantly with ICs self-esteem (CG). A two-step hierarchic multiple regression analysis was used to assess which variables predicted CG. P-values < .05 were considered statistically significant. Results: Bivariate analyses revealed that CG was significantly correlated with ICs sense of competence, social support, empathy,

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depression, anxiety, subjective health, relationship quality and spousal status. No significant correlations were found between scores on neuropsychological tasks and CG, although trends were found in the expected direction (higher scores were associated with more CG). Regression analysis identified two factors significantly predicting CG (adjusted R^2 = .439): relationship quality (standardized β = .564, p <.001) and depression (standardized β = -.151, p = .048). Conclusion: ICs experiencing a better relationship quality and fewer depressive symptoms are more likely to experience CG. Interventions focused on enhancing CG should strive to optimize the caregiver's relationship quality with the patient and to alleviate caregiver depression. Correspondence: *Linda Jutten, MSc, PhD candidate Tilburg University, Department of Cognitive Neuropsychology Warandelaan 2, 5037 AB Tilburg Room S2.02 | Mailbox S3.07. L.H.Jutten@uvt.nl*

Leger G, Banks S, Leverenz J, Bekris LM. Behavioural variant FTD without ALS caused by UBQLN2 P525S mutation

Background: Amyotrophic Lateral Sclerosis (ALS) and Frontotemporal Dementia (FTD) represent extremes of a neurodegenerative spectrum with significant overlap. Gene mutations can cause these diseases in isolation or combination. Ubiquilin 2 (UBQLN2) mutations have recently been attributed to cases of pure ALS or combination ALS/FTD. Aim: To describe a well characterized case of FTD caused by a UBQLN2 mutation without clinical evidence of ALS. Case: A 69-year-old man brought by family: 2-year history of personality changes, including increased gregariousness, unwelcomed familiarity, and grandeur, at times delusional, when telling stories. There was "lack of filtering" in conversation. Appetitive changes includied a diet of Frappuccino's, jelly beans and devil dogs. Father died of liver cancer at 53, mother from dementia at 83, sister 2 years older with hypochotdriasis, and "bipolar" brother passed on at 60 from pancreatic cancer. Examination: mild diffuse extrapyramidal syndrome and no evidence of motor neuron disease. MoCA 20/30: attention/concentration deficits with impact on memory. Neuropsychological assessment: tangentiallity, impulsivity, impersistence. Deficits in learning, attention, and executive functions, with intact contextual memory, language, and visual spatial functions. MRI and FDG-PET scans showed focal frontal and anterior temporal atrophy and hypometabolism. Whole exome sequencing failed to reveal the better known genetic causes of FTD (MAPT, GRN and C9orf72), but did show a known pathologic P525S mutation of the UBQLN2 gene. Discussion: To our knowledge, this is the first documented case of an isolated presentation of behavioural variant FTD without ALS, caused by a mutation in UBQLN2. Although still rare, this case further expands the spectrum of diseases caused by this mutation. Correspondence: *Gabriel Leger MD, Cleveland Clinic Lou Ruvo Center for Brain Health, 888 West Bonneville Ave, Las Vegas NV 89135 USA. daniel.mograbi@kcl.ac.uk*

Fields J, Boeve B, Rosen H, Boxer A, Coppola G, Dheel C, Dickerson B, Fong J, Gavrilova R, Ghoshal N, Goldman J, Graff-Radford N, Grossman M, Heuer H, Hsiao J, Huey E, Irwin D, Kantarci K, Karydas A, Knopman D, Kornak D, Kraft J, Kukull W, Kramer J, Mackenzie I, Miller B, Miller M, Phelps C, Rademakers R. Cognitive changes in phenoconverters from asymptomatic to minimally symptomatic FTLD: Preliminary data in the LEFFTDS cohort

Background: The Longitudinal Evaluation of Familial Frontotemporal Dementia Subjects (LEFFTDS) Consortium is investigating subjects with microtubule associated protein tau (MAPT), progranulin (GRN), and chromosome 9 open reading frame 72 (C9orf72) mutations in presymptomatic and symptomatic phases annually to model rates of decline. Methods: Asymptomatic (i.e., modified Clinical Dementia Rating (CDR) scale = 0) mutation carriers who completed baseline and first annual follow-up (n = 148; 47 MAPT, 49 GRN, 52 C9orf72) were assessed for phenoconversion based on clinical assessment. Standardized neuropsychological measures in 5 cognitive domains were administered at both time points but not considered in clinical diagnosis. Results: Five (3%) asymptomatic subjects phenoconverted to minimally symptomatic (CDR = 0.5) at first annual visit: 4 MAPT carriers,1 GRN carrier. All met criteria for clinically possible behavioural variant FTD. The GRN carrier showed > 1 standard deviation decline in 6 of 14 cognitive measures and decline in functional abilities (Functional Abilities Questionnaire (FAQ) score from 0 to 7). Two of the MAPT carriers declined on 4 measures, with minimal decline in FAQ (< 3 points), while the other two declined on 2 measures, with no decline in FAQ. No clear pattern of cognitive decline was observed. Conclusions: Phenoconversion to minimally symptomatic FTD has occurred in 3% of asymptomatic LEFFTDS subjects to date, primarily among MAPT mutation carriers. At this minimally symptomatic stage, no cognitive pattern is discernible but the degree of cognitive decline is commensurate with functional decline. Future longitudinal evaluations and biomarker analyses will help identify predictors of outcome in asymptomatic carriers. Correspondence: *Julie Fields, PhD, Mayo Clinic, 200 First Street SW, Rochester Fields, United States. julie@mayo.edu*

Diab S, Postuma R, Gagnon JF. Depressive and anxiety symptoms in Parkinson's Disease with mild cognitive impairment

Objective: To evaluate depressive and anxiety symptoms in Parkinson's Disease (PD) patients with mild cognitive impairment (MCI) using subscales from the Beck Depression Inventory (BDI-II) and Beck Anxiety Inventory (BAI). Background: Depression and anxiety are frequent nonmotor symptoms in PD patients. However, subscales of the BDI-II and BAI have never been studied in relation to cognitive status in PD patients. Methods: We evaluated 35 PD patients without dementia who were only taking dopaminergic medication and 26 healthy subjects. Seventeen PD patients had MCI (PD-MCI) and 18 did not (PD-nMCI). All participants underwent a neuropsychological assessment and completed the BDI-II and BAI. One-way analyses of

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variance were performed to assess between-group differences on the subscales of BDI-II and BAI. Results: No significant between-group differences were found for age, gender, education, PD duration, PD severity, or dopaminergic medication. Compared to controls, both PD-MCI and PD-nMCI groups scored higher on the BDI-II somatic subscale. We found no significant between-group differences on the BDI-II affective subscale. For the BAI, PD-MCI patients scored higher on the affective subscale compared to PD-nMCI patients and controls. Moreover, PD-MCI and PD-nMCI patients scored higher than controls on the tremor and hypotension subscales. Correspondence: *Sabrina Diab, Psy D Candidate in Neuropsychology, UQAM 372 av revere H3P 1C3 Quebec, Montreal, Canada. sabrinadiab@gmail.com*

Smith GE, Chandler M, Fields JA, Locke DEC. Patient and partner treatment and outcome preferences in mild cognitive impairment

Introduction: The patient-centred movement in health care is increasing efforts to design studies and interventions that address the outcomes that matter most to patients and their families. Research has not adequately addressed Alzheimers Disease patient and caregiver preferences. Methods: Extending prior work, we conducted an online survey regarding outcome and intervention preferences. Participants were patients with MCI and partners who completed the HABIT Healthy Action to Benefit Independence & Thinking programme. Ultimately, data on outcome preferences and treatment importance were available for 109 and 122 respondents, respectively. This represents 41% and 45% of the 269 HABIT® completers at the time of the survey. Thirty-one of the responses were from patients, 74 were from partners, and in 17 cases the patient and partner reportedly worked together to complete the survey. Seventy-one percent of the patient respondents were male, while just 26% of the care partners were men. Spouses constituted 86% of care partners, 9% were the adult children of the patient and 5% were friends of the patient. Mean (standard deviation) age of the patient and partner groups were 72.3 (8.2) and 67.3 (9.3) years, respectively. Mean (standard deviation) education for the patient and partner groups were 17.0 (2.3) and 16.3 (2.1) years, respectively. RESULTS: Both patient and partner respondents ranked patient quality of life as the highest priorities, ranking ahead of patient self-efficacy and functional status, patient mood, patient memory performance, distressing behaviours and caregiver outcomes (burden, mood and self-efficacy). Regarding, the importance of HABIT® programme components, memory compensation training was ranked highest and wellness education lowest by all groups. Discussion: Additional research should compare patient preference for patient reported outcomes, traditional neuropsychological and clinician outcomes and modern biomarker outcomes. Correspondence: *Glenn Smith, PhD, Department of Clinical and Health Psychology, University of Florida, Gainesville. glennsmith@phhp.ufl.edu*

Berezuk C, Zakzanis K, Ramirez J, Black S. Men with experience preparing meals show greater functional independence in mild cognitive impairment

Objective. The purpose of this study is to examine whether experience preparing balanced meals is associated with functional independence in men with mild cognitive impairment (MCI). We hypothesized that experience preparing meals may increase one's "functional reserve", thus promoting independence across other instrumental activities of daily living (IADLs). Participants and methods. Men with MCI were taken from the Alzheimer's Disease Neuroimaging Initiative (ADNI). We conducted ten Chi-square analyses comparing experience preparing meals (dichotomous) and difficulty on each IADL (dichotomous), assessed using the Functional Activities Questionnaire. Results: No significant differences in age, years of education, and Montreal Cognitive Assessment (MoCA) scores existed between men with meal preparation experience ($n = 359$) and those without ($n = 153$). Chi-square analyses found that meal preparation experience is associated with independence in the ability to prepare a balanced meal ($p < .001$); shop alone ($p < .001$); keep track of current events ($p < .002$); remember appointments and dates ($p < .001$); follow TV, books or magazines ($p < .001$); and travel out of the neighbourhood ($p = .015$). Conclusion: Given that preparing a balanced meal is cognitively multifaceted (e.g., requires planning, organizing, retrospective and prospective memory), shared neural networks may exist between cooking and other IADLs. These findings may have implications for identifying those at a higher risk for functional decline. For example, inexperience preparing meals may contribute to a lower "functional reserve", thus reducing one's resiliency to functional decline overall. Future replication studies are needed using a more sophisticated measure of functional reserve. Correspondence: *Courtney Berezuk, MA student, University of Toronto, 1121-109 Front Street E, Toronto, Canada. courtney.berezuk@mail.utoronto.ca*

Tan LYR, Hameed S, Ting S, Tay SY. Differences in caregivers' and patients' perceptions of fitness to drive as a function of type and degree of mild cognitive impairment

Despite the ample literature on driving behaviour differences between Alzheimer's Disease (AD) and Mild Cognitive Impairment (MCI) patients, less is known about how driving patterns differ amongst subtypes within the MCI group. MCI is a term defining the intermediate stage of objective cognitive decline and functional status and is sub-categorized based on two factors – type and degree of impairment (Peterson, 2004). It is likely that the range of functional abilities of patients with MCI vary depending on these sub-categories. In neuropsychological practice, clinicians often use patient and informant reports to consider patient's functional status and one's ability to drive may be perceived differently by each party. Thus, better understanding of misaligned caregiver-patient perceptions is likely to improve treatment and management options for this population. Aim: To examine perception differences between patients with MCI and their caregivers on their ability to drive safely, and how they vary based on the sub-categories of MCI. Method:

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30 patients with MCI and 30 respective caregivers from Singapore General Hospital will be recruited and a questionnaire regarding their perceptions will be administered. Data regarding the different subtypes of MCI and the degree of cognitive impairment will be gathered from medical records of a baseline neuropsychological assessment results done within 9 to 12 months of the study. Results: It is hypothesized that 1) Perception differences are more likely to be present for patients with amnestic-MCI than non-amnestic MCI; 2) Perception differences are more likely to be present for patients with multiple-domain impairment than single-domain impairment; 3) Interaction effects are found between MCI type and MCI severity. The relationship between the MCI sub-categories and the perception differences will be analyzed using chi-square test and non-parametric t tests. Conclusion: The results and implications will be discussed in the context of our local settings. Correspondence: *Tan Yan Rong Lysia, MA Clinical Psychology, Neurology, Singapore General Hospital, 20 College Rd, Singapore 169856, lysia.tan.y.r@sgh.com.sg*

Plenary. Mechanisms of Cognitive Disparity in Older Adults: The Role of Race, Culture and Education
Presenter: Jennifer Manly
10:30-12:30

Manly J. Mechanisms of Cognitive Disparity in Older Adults: The Role of Race, Culture and Education

There is a rich history of empirical evidence demonstrating that race/ethnicity and socioeconomic status are fundamental causes of inequalities in health. However, research linking race, culture, and education to inequalities in neurological conditions that have their onset in later life such as dementia is relatively recent. Research in the United States shows that African Americans, Latinos, and American Indians are at elevated risk of developing Alzheimer's disease, dementia, and cognitive impairment compared to non-Hispanic Whites and Asian Americans. These disparities were identified in epidemiological samples, but in the clinical setting, cognitive impairment and dementia are frequently underdiagnosed and undertreated among these groups. This presentation will address several methodological challenges to identification of mechanisms of racial/ethnic and educational disparities in cognitive impairment and dementia among older adults. Confounds that are frequently unmeasured such as educational quality, bias due to mortality and selection, as well as bias in measurement of memory, language, executive function, and other neuropsychological domains are among these challenges. Potential mechanisms of racial and educational disparities in dementia have been investigated and include genetics, inflammation, accelerated aging, cardiovascular and cerebrovascular disease, residential segregation, experience of discrimination, cognitive engagement, stress, and psychosocial function. The evidence to date points to early life social factors as having the enduring influences on later life cognition. These data suggest that addressing the dementia epidemic and achieving health equity in Alzheimer's disease will require early-life social policy interventions. Correspondence: *Jennifer Manly, PhD, Neuropsychology in Neurology, G.H. Sergievsky Center and Taub Institute for Research in Aging and Alzheimer's disease, Columbia University. tom.manly@mrc-cbu.cam.ac.uk*

Plenary. Diagnostic Approaches in Progressive Disorders: From Subjective Symptomology to Neurobiomarkers
Presenter: Michael Saling
11:30-12:30

Saling M. Diagnostic Approaches in Progressive Disorders: From Subjective Symptomology to Neurobiomarkers

There are about 47 million people in the world with dementia. By 2050, this number will have tripled to some 132 million, with an economic burden rising to several trillions of US dollars. A global ambition to prevent, or effectively treat Alzheimer's Disease (AD) by 2025 has been tabled. In the lead-up to this deadline efforts to refine very early detection strategies that are scalable for world-wide deployment should be re-doubled. In this address, I will argue that the challenge for neuropsychology is identification of the earliest subjective features of AD dementia, and neurocognitive markers that are able to interrogate the neuronal networks that are the earliest hosts to cognition-destroying pathologies. AD is defined by two pathologies, and their respective contributions to the neurocognitive staging of AD dementia is controversial, but a number of pieces of this rather complex puzzle are falling into place. These include: 1) a greater understanding of the cognitive functions, subjective and objective, of the earliest brain regions to become involved in AD; 2) differential mapping of in vivo biomarkers onto distinct cerebral networks; 3) detection of preferential associations between in vivo biomarkers and cognitive dysfunction; cerebral mapping of subjective symptomatology; and 4) phenomenological description of AD-related cognitive complaints. A looming and overwhelming world-wide burden of dementia, together with a global resolution to find an effective treatment, poses a significant challenge to our field, demanding a methodological and conceptual expansion. I hope that this address sketches out, albeit in a highly preliminary fashion, some helpful directions. Correspondence: *Michael Saling, PhD, Associate Professor of Neuropsychology, University of Melbourne, Australia, Director of Neuropsychology, The Austin & Repatriation Medical Centre, Melbourne. mmsaling@unimelb.edu.au*

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Invited Symposium. State of the Art Research and Developments in the Field of Sports Concussion
Chair: Ann Edwards
13:15-15:15

Zoccola D, Shuttleworth-Edwards AB, Radlof SE. Neurocognitive effects of head and body collisions on players of club level rugby union

Objective: The objective of the study was to investigate the neurocognitive effects of repetitive concussive events in players of club level Rugby Union (hereafter rugby) during the course of one rugby season. Participants and method: Amateur adult club level rugby players (n = 20) were compared with a non-contact control group (n = 22) of equivalent age, years of education and estimated IQ, at three test intervals: pre-, mid- and postseason. Video analyses documented the tackling record of the players during all matches across the rugby season. Five rugby players observed to have a head jarring event were isolated for neurocognitive follow-up. Measures included the ImPACT Verbal and Visual Memory, Visual Motor Speed and Reaction Time composites, and the Purdue Pegboard. Independent and dependent statistical analyses were employed to compare the rugby versus control group neurocognitive test profiles across the three test intervals. Descriptive comparisons of individual neurocognitive test scores with normative data were employed for the case analyses. Results: Tackling analyses revealed a sobering seasonal average of more than a thousand tackles per player, excluding any contact practice sessions. Taken together, the comparative results for the test measures on the group and individual analyses implicated vulnerability among club rugby players on the motor and speeded tasks, with less robust indications on the memory tasks. Conclusions: The results add to a growing body of literature that implicates deleterious neurocognitive effects in participants of a sport such as rugby due to repetitive head jarring incidents that are intrinsic to the game. Correspondence: *Diana Zoccola, PhD, Department of Psychology, Rhodes University, Grahamstown, 6139, South Africa. dzoccola@mwebbiz.co.za*

Pardini DA, Pardini JE, Sterling JC, Kisana H, Mattis JM. Symptom count, not severity, is the best predictor of concussion recovery in pediatric athletes

Objective: The management of concussion within pediatric populations relies heavily on assessment tools that ask youth to rate both the presence/absence and severity of post-concussive symptoms. However, it remains unclear whether the overall severity or total number of symptoms endorsed on these instruments best delineates which youth will experience a prolonged recovery. Method: We examined this issue in a sample of 241 (82 female) athletes ages 10-18 (M = 14.91; SD = 1.81) seen within a US sports concussion clinic within 7 days of injury (M = 3.54; SD = 1.67). Participants completed a computerized version of the Post-Concussion Symptom Scale (PCSS). The PCSS asks participants to rate their experience of 22 symptoms on a scale from 0 (“absent”) to 6 (“severe”). The outcome was the number of days until participants were cleared to return to play by a physician based on being symptom-free at rest/exertion and exhibiting normal neurocognitive test performance (M = 24.7; SD = 10.93, range 2-50 days). Results: The total number of symptoms endorsed, regardless of severity rating, exhibited a stronger association with days to recovery ($r = .46$, $p < .001$) than a summative symptom severity score ($r = .35$, $p < .001$). This finding was consistent whether athletes were assessed within 3 days post-injury (count r = .41; severity r = .31) or 3-7 days post-injury (count r = .48; severity r = .36), and was observed for female (count r = .44; severity r = .28) and male (count r = .45; severity r = .39) athletes. Conclusion: Our findings suggest that symptom count may be a more parsimonious way to examine concussion severity as it relates to recovery time. Correspondence: *Dustin Pardini, PhD, Arizona State University, School of Criminology and Criminal Justice; Phoenix, AZ. dustin.pardini@asu.edu*

Alexander D, Shuttleworth-Edwards AB. Interaction effects reveal cognitive vulnerability in late adolescent rugby-playing scholars

Objective: The aim of this paper was to review the results of two previously published prospective studies demonstrating signs of cognitive vulnerability on late adolescent players of Rugby Union (hereafter rugby) compared with non-contact sport controls. Method: Study 1 reports on pre- and post-season ImPACT Visuomotor Speed composite scores for university and late high school rugby players (n = 145) versus noncontact sport controls (n = 106). Study 2 reports on academic records for rugby players with and without seasonal concussion (n = 45, n = 21, respectively), and noncontact sport controls (n = 30) from early to late high school levels. In both studies the interaction effects for time were statistically investigated, and graphically represented. Results: Significant interaction effects were in evidence in both studies. In Study 1 the ImPACT Visual Motor Speed Composite for rugby players did not reveal the practice effect that was in evidence for the control group. In Study 2, the academic records for both the rugby playing groups failed to show the improvement that was in evidence for the control group. Conclusions: Taken together the implications from these studies is that rugby playing scholars show cognitive vulnerability due to the repeated subconcussive and/or concussive insults at a critical period of time in the life course for academic advancement. It is postulated that diminished abilities in processing speed and slowness to benefit from procedural learning are critical ingredients for examination success, providing a likely association with the demonstrated academic fall-off over time. Correspondence: *Debbie Alexander, PhD, Psychiatry Department, Medical and Health Sciences Faculty, Stellenbosch University, Francie Van Zyl Drive, Tygerberg, 7505, Western Cape. Debbie@privateclient.co.za*

Pardini JE. Return to learn following sport-related concussion

Objective: The objective of this study was to explore the Return to Learn literature in concussion and develop evidence-based guidelines for returning to the classroom following injury. Method: A literature search was performed

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examining cognitive outcomes following acute concussion, as well as in post-concussion syndrome. A comprehensive literature search was performed for articles that address returning to the classroom and/or to work following mild traumatic brain injury. Results: Studies of neuroimaging data and neurocognitive testing have consistently demonstrated physiological and functional changes following concussion, and degree of cognitive difficulties and physiological changes have been related to post-concussion symptom severity. There is a dearth of studies that empirically examine return to learn (RTL), although a large proportion of concussed students report academic and/or cognitive difficulties. One prominent issue is a lack of knowledge on behalf of school personnel/providers about how to progress a student through RTL. Very few states have RTL laws, and even fewer have requirements for training in RTL. Extension of deadlines and rest periods are the most frequent accommodations provided to students. Conclusions: In view of demonstrated post-concussion cognitive changes, RTL has become an important process of concussion management, and has mirrored progress in physical return to play progressions. However, it is a newer concept that continues to evolve. Identified cognitive and functional changes typical to concussion can be applied to clinically-determined academic accommodations to begin to shape an empirical basis for our recommendations. Future research should address the effectiveness of empirically derived versus usual RTL protocols. Correspondence: *Jamie E. Pardini, PhD, Director of Neuropsychology, Clinical Associate Professor, Division of Neurosciences, Banner University Medical Center, Phoenix, 755 E McDowell St, 3rd Floor, Phoenix, AZ 85006. Jamie.pardini@bannerhealth.com*

Lovell MR. A new validated screening tool for concussion in children ages 5 through 11

Objective: The objective of this study was to develop and validate a brief computer-based cognitive screening tool for young children ages 5 to 11 years of age (ImPACT Pediatric). Previously there have been no validated and FDA approved computer-based tools designed for this purpose. Method: A normative sample of 915 children between the ages of 5 and 11 years old was used. The sample was stratified by one-year increments to allow evaluation of developmental differences in performance between age groups. Seventy percent of the subjects were male. The number of statistical analyses completed included a Factor Analysis, and test-retest reliability construct validity studies. Results: An exploratory factor analysis of the 10 component tests yielded a fourfold solution. Specifically, sequencing/attention, word memory, visual memory and reaction time factors were identified. These factors were then utilized to create standardized (T) factor scores. Test-retest reliability data were collected within one week to one month following the first test and all interclass correlations (ICC's) were significant ($p < .001$) with correlation coefficients ranging from .54 to .83. With regards to construct validity, correlations with a traditional child neuropsychological measure (the WRAML-2) were also significant. Conclusions: The above-mentioned studies provide validation and reliability data for ImPACT Pediatric, which has now been approved for clinical use by the United States Food and Drug Administration (FDA). Correspondence: *Mark R. Lovell, PhD, Chairman and Chief Scientific Officer imPACT Applications, INC, FACPN, INC. 615 Washington Road, Suite T3, 412-327-5957. Mlovell@impacttest.com*

Paper Presentations. Adult Assessment/Cross-Cultural Assessment 13:15-15:15

Rijnen S, van der Linden S, Campman CAM, Meskal I, Gehring K, Sitskoorn M. Evaluation of normative data for the computerized neuropsychological battery CNS vital signs: Effects of sociodemographic variables in a Dutch healthy sample

Introduction: CNS Vital Signs (CNS VS) is a computerized battery of neuropsychological tests that is translated into many languages. However, CNS VS normative data established over a decade ago, are solely age-corrected, and only collected in an American population. METHOD. Mean performance of healthy Dutch participants on seven commonly used cognitive domains, as measured by CNS VS, was compared to the original CNS VS norms (based on 1069 American participants), using a series of two-tailed one-sample Z-tests. To explore the effects of the sociodemographic factors age, education and sex on CNS performance, a series of multiple linear regression analyses was conducted. Results. 159 (57% female; age 20-80) participants were included. Z-tests demonstrated no significant differences in performance on 4 out of 7 cognitive domains. However, Dutch participants showed significantly higher scores on Processing speed, psychomotor speed, and cognitive flexibility. Effect sizes were small for processing speed and cognitive flexibility (Cohen's d's respectively 0.29 and 0.19), to medium for psychomotor speed (Cohen's $d = 0.48$). In addition to the known effects of age, effects of education (on 3 domains) and sex (on 1 domain) on CNS VS performance were found in the Dutch sample, with the total explained variance of performance ranging from 6.9% for verbal memory up to 46.8% for processing speed. Discussion. Careful interpretation of performance on CNS VS is warranted when the original American norms are applied in other populations. Sociodemographic factors should be taken into account, for example. by using in regression-based normative formulae. Correspondence: *Sophie Rijnen, Elisabeth-TweeSteden ziekenhuis, Hilvarenbeekseweg 60 5022GC. s.rijnen@etz.nl*

Robbins R, Joska J, Gouse H, Brown H, Brown H, Ehlers A, Scott T. Construct validity of a tablet application to assess neurocognition in South Africa

Objective: NeuroScreen is a brief, tablet-based neuropsychological (NP) assessment application developed for use by lay-professionals in resource-limited settings to screen for neurocognitive impairment. It is comprised of eight NP tests assessing the domains of learning, memory, processing speed, executive functions, attention/working memory, and motor speed. It can be administered in English and isiXhosa. This study examined the construct validity of

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each NeuroScreen subtest. Methods: One hundred and fourteen, Black South African adults (51% female, 34.44 mean years of age) with no major medical, psychiatric, or neurologic problems were administered NeuroScreen by lay counsellors. Then, participants completed a comprehensive NP battery of well-established paper-and-pencil tests administered by a trained psychometrist. Results: Pearson correlation coefficients were calculated between the NeuroScreen raw tests scores and raw paper-and-pencil test scores. Weak to strong statistically significant correlations were observed between the NeuroScreen and paper-and-pencil tests of verbal memory ($r = .26$, $p < .01$), processing speed ($r = .61$, $p < .01$; $r = .67$, $p < .01$; $r = .38$, $p < .01$), working memory ($r = .27$, $p < .01$; $r = .51$, $p < .05$), executive functions ($r = .23$, $p < .05$; $r = -.32$, $p < .01$;), and motor functioning ($r = -.3$, $p < .01$). Conclusion: Findings provide evidence that the NeuroScreen tests tap the NP domains of memory, working memory, processing speed, executive functions, and motor speed. Although NeuroScreen shows convergence with paper-and-pencil tests for Black South Africans, further research is needed to evaluate test-retest validity, and its ability to detect neurocognitive impairment. Correspondence: *Reuben Robbins, PhD, Columbia University and New York State Psychiatric Institute, 1051 Riverside Drive Unit 1, New York. rnr2110@cumc.columbia.edu*

Motswai P, Gadd C. Towards a neuropsychology internship programme: Evaluation of the neuropsychology service delivery at 1 Military Hospital

Until recently South Africa had no formal registration category for neuropsychologists. In 2011 the Health Professions Council of South Africa (HPCSA) added neuropsychology to the scopes of practice for professional psychologists and subsequently certain South African universities developed neuropsychology masters training programmes. Currently there are no professionally registered neuropsychologists as the register remains inactive. Registration in the professional psychology categories requires a one-year internship – these are currently not available for neuropsychology. A need thus exists to develop a neuropsychology internship. At 1 Military Hospital, the clinical psychology internship programme includes a 6-month rotation in the Neuro-Rehabilitation ward, which provides training and supervision in neuropsychological assessment, report writing, clinical interviewing, and therapy within a multidisciplinary context. This study evaluated the common categories of clients encountered during this rotation and qualitatively explored the experiences of interns during this rotation as a first step towards developing a neuropsychology internship. Fifty-two ($n = 52$) clients were admitted over a year. The majority experienced cerebrovascular incidents (44%), traumatic brain injuries (32%), and other types of brain ailments (24%). Thematic content analysis of the interns' experiences highlighted the common challenges while working with each client. Findings suggest that the development of a neuropsychology internship programme requires a sound theoretical background of neuropsychology, and training in assessment and report writing. However, in addition, an emphasis on core therapeutic competencies may assist neuropsychologists to navigate the intricacies of working in a diverse African context where assessments alone may not provide a clear picture of a client's fallouts, needs and clinical progression. Correspondence: *Phenyo, PK Motswai, MA Research Psychology, Psychology Department, University of Pretoria, 2 Lynnwood Road Pretoria, 0002, South Africa. phenyo.molamu@gmail.com*

Maphisa J. Neuropsychology training in Africa: An analysis of 126 universities in 30 countries

The development of neuropsychology in Africa is in the spot light as the International Neuropsychological Society (INS) hosts its 2017 mid-year meeting in Cape Town, South Africa. One important index that can be used to measure the progress of the discipline in Africa is the availability of training opportunities on the continent. A content analysis was conducted on the websites of 126 universities in 30 countries across the 5 regions of Africa to establish the following: 1) the presence of a psychology department; 2) the presence of a neuropsychology programme; 3) the presence of neuropsychology-related courses at any level; and 4) the presence of a clinical psychology programme. The analysis revealed the presence of fifty-one (51) psychology departments, three (3) neuropsychology programmes, seventy-five (75) neuropsychology-related courses, and sixteen (16) clinical psychology programmes. These findings highlight the limited opportunities for neuropsychology training in Africa, and make a case for the establishment of more training programmes in neuropsychology. The increase in such programmes is likely to contribute to the endeavours of cross-cultural research in neuropsychology. Correspondence: *J. Maphisa Maphisa, MA Clin Psych, University of Botswana, Private Bag UB 00705, Gaboroni, Botswana. maphisa.maphisa@mopipi.ub.bw*

Truter S, Mazabow M, Paredes A, Rivera D, Arango–Lasprilla J. The state of neuropsychology in South Africa

Objective: This paper aims to offer insight into the state of neuropsychology in South Africa (SA). Method: A survey that forms part of an international research study was sent to psychologists in SA, inviting those working in the field of neuropsychology to participate. Data were acquired on training received, work situation, income earned, referral sources, neuropsychological tests popularly used, types of patients seen, involvement in rehabilitation and rehabilitation techniques, teaching involvement and research activities. Results: Ninety-five psychologists working in the field of neuropsychology in SA were included in the analysis. Some of the notable findings were: SA performs significantly less rehabilitation work than forensic work; South Africans spend between 2 and 48 hours performing assessments and report-writing; South Africans perform mostly forensic activities and work largely in private practice; and test use seems to be influenced by the availability of relevant norms. Conclusions: The SAsurvey data highlighted areas for improvement. Specifically, it exposed the need to enhance clinical training, develop professional certification programmes, validate existing neuropsychological tests, and create new, culturally relevant instruments. Correspondence:

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Truter Sharon, PhD, Honorary Research Associate, Department of Psychology, Rhodes University, Grahamstown, South Africa. sharon@inter-ed.co.za

Tay SY, Tan LYR, Hameed S, Ting S. Caregivers' perception of fitness to drive, patients' self-awareness and global cognitive function in cognitive impairment

While there is generally an adverse impact of neurodegenerative diseases on one's driving capacity, many with cognitive impairments can continue to drive safely for several years following their diagnosis. Self-awareness has been found to be an important factor in minimizing unsafe driving and is a significant predictor of fitness to drive in patients with cognitive impairment. While a study had suggested that caregiver's opinion of patient's ability to drive have been shown to predict fitness to drive, others have not found this relationship and cautioned about inaccurate and biased reports due to poor detection of the patient's gradual decline in driving skills. There are currently no studies that have examined perception of driving ability either from the patient with cognitive impairment or their caregiver's point of view or its relationship with the degree of existing cognitive impairments, which could help in the design of effective interventions for decreasing dangerous driving behaviour in the future. We aim to examine the perception of patients with cognitive impairment and their caregivers on their ability to drive safely, and its relationship with global cognitive performances. A total of 30 patients (diagnosed with Alzheimer's Disease or Mild Cognitive Impairment) will be assessed with Mini-Mental State Examination and Clinician Dementia Rating Scale. Together with their caregivers, a survey to assess self- and caregivers' perception of these patients' driving abilities as well as their memory difficulties will be conducted. We hypothesize that patients' self-perception of own driving ability is not correlated with caregiver perceptions; patients' self-perception of driving ability is not correlated with their degree of cognitive functioning, and perception of patients' driving ability is negatively correlated with patients' degree of cognitive functioning. These relationships will be analyzed using chi-square test and nonparametric t tests. The result and its implications will be discussed in the context of our local settings. Correspondence: *Sze Yan Tay, Masters of Psychology (Clinical), Department of Neurology, Singapore General Hospital, 20 College Road Academia, Level 4, Singapore 169856. tay.sze.yan@sgh.com.sg*

Symposium. Getting in Touch with our Roots: How Historical Figures in Neuropsychological Rehabilitation Continue to Influence our Current Clinical Practice
Chair: Barbara Wilson
13:15-15:15

Wilson B. Kurt Goldstein – The father of modern brain injury rehabilitation

Aims: To describe the major contributions Oliver Zangwill made to brain injury rehabilitation and to demonstrate that his work still influences modern brain injury rehabilitation. Background: The most influential Briton working in brain injury rehabilitation in world war two (WW2) was Oliver Zangwill. He worked in Bangour Hospital just outside Edinburgh with British soldiers who had survived brain injuries. Method: We describe the major contributions made by Zangwill and consider his legacies to modern brain injury rehabilitation. Results: Zangwill was concerned with the principles of re-education; he said there were three main approaches to rehabilitation: 'compensation', 'substitution', and 'direct retraining'. This was the first time anyone categorised rehabilitation in this way. In Zangwill's own words, "We wish to know in particular how far the brain injured patient may be expected to compensate for his disabilities and the extent to which the injured human brain is capable of re-education". This question is as pertinent now in the twenty-first century as it was during WW2. Conclusions: Since Zangwill's work during WW2, others have modified, adapted or incorporated his principles. He certainly made his mark on brain injury rehabilitation. He said that the brain injuries unit in Edinburgh marked the beginning of scientific interest in the re-education of people with brain injury in the United Kingdom. His work has implications for psychology in general, his theoretically driven approach is the reason British and American neuropsychological assessment has followed a different path. Correspondence*: Barbara Wilson, PhD, The Oliver Zangwill Centre, Ely, UK and The Raphael Medical Centre, Tonbridge, UK, The Oliver Zangwill Centre, Princess of Wales Hospital, Lynn Rd, Ely, Cambridgeshire, CB6 1DN, United Kingdom. barbara.wilson00@gmail.com*

Wilson B. Oliver Zangwill – The father of British neuropsychology

Aims: To describe the major contributions Oliver Zangwill made to brain injury rehabilitation and to demonstrate that his work still influences modern brain injury rehabilitation. Background: The most influential Briton working in brain injury rehabilitation in world war two (WW2) was Oliver Zangwill. He worked in Bangour Hospital just outside Edinburgh with British soldiers who had survived brain injuries. Method. We describe the major contributions made by Zangwill and consider his legacies to modern brain injury rehabilitation. Results. Zangwill was concerned with the principles of re-education; he said there were three main approaches to rehabilitation: 'compensation', 'substitution', and 'direct retraining'. This was the first time anyone categorised rehabilitation in this way. In Zangwill's own words, "We wish to know in particular how far the brain injured patient may be expected to compensate for his disabilities and the extent to which the injured human brain is capable of re-education." This question is as pertinent now in the twenty first century as it was during WW2. Conclusions. Since Zangwill's work during WW2, others have modified, adapted or incorporated his principles. He certainly made his mark on brain injury rehabilitation. He said that the brain injuries unit in Edinburgh marked the beginning of scientific interest in the re-education of people with brain injury in the United Kingdom. His work has implications for psychology in general, his theoretically driven approach is the reason British and American neuropsychological assessment has followed a different path. Correspondence: *Barbara Wilson,*

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PhD, The Oliver Zangwill Centre, Ely, UK and The Raphael Medical Centre, Tonbridge, UK, The Oliver Zangwill Centre, Princess of Wales Hospital, Lynn Rd, Ely, Cambridgeshire, CB6 1DN, United Kingdom. barbara.wilson00@gmail.com

Watts A. Alexandr Romanov Luria - The grandfather of neuropsychology

Aims: To describe the major contributions Alexandr Luria has made to brain injury rehabilitation and to demonstrate that his work still influences modern brain injury rehabilitation. Background: In world war two (WW2), Luria, working in what was then the Soviet Union, led a research team at an army hospital looking for ways to compensate psychological dysfunctions in patients with brain lesions. The tragic widespread availability of people with various forms of traumatic brain injury provided him with voluminous materials for developing his theories of brain function and methods for the remediation of focal brain lesions Methods: Luria's principles are described. Results: While chief of an army hospital in WW2, Luria continued his theoretical work and his development of methods for evaluation to include methods for rehabilitation, later published in "Traumatic Aphasia" (1947), "Restoration of Brain Function after War Injuries" (1948) and "Higher Cortical Functions in Man" (1966). He believed that psychological research should be for the benefit of humankind and, we should look at the person in his or her social context. One important principle, also stressed by Goldstein and Zangwill, was that of "functional adaptation" whereby an intact skill is used to compensate for a damaged one. Conclusions" Luria's approach promotes individualised planning of rehabilitation programmes; intact functions are used; deficits as compensation mechanisms are brought to the patients' awareness through feedback; this supports the patient's motivation and efforts. Correspondence: *Ann Watts, PhD, PsySSA, Entabeni Hospital 148 Mazisi Kunene Road Durban 4001, South Africa. anndwatts@iafrica.com*

Evans J. Yehuda Ben-Yishay – The father of holistic rehabilitation

Aims: To describe the major contributions Yehuda Ben-Yishay has made to brain injury rehabilitation and to demonstrate that his work still influences modern brain injury rehabilitation. Background: Yehuda Ben-Yishay, an American Israeli working in New York with Leonard Diller, was invited back to Israel after the Yom Kippur war of 1973 to help rehabilitate Israeli soldiers with brain injury. Method: We describe the procedures used by Ben-Yishay and consider his major legacies. Results: In 1973, after the Yom Kippur War, Ben-Yishay was asked by the Israeli government to set up a programme for the soldiers who had survived brain injury. He started his 'Milieu Therapy', which was the precursor of the holistic programmes. The Milieu approach recognised the importance of the social and emotional consequences of brain injury and suggested that if these are not treated, rehabilitation of cognitive deficits will fail. The central idea of the holistic programmes is that cognitive, emotional, behavioural and physical consequences of brain injury interact in complex ways to affect a person's functioning in everyday life. The presentation will outline how the concept of an integrated, holistic, therapeutic mileu was implemented in clinical practice by Ben-Yishay, and evidence for the influence of these ideas on a number of other influential neuropsychological rehabilitation programmes around the world will be discussed. Conclusions: Holistic rehabilitation programmes are probably the most widely evaluated and successful programmes in brain injury rehabilitation today. The success of this approach can be clearly traced to the pioneering work of Ben-Yishay. Correspondence: *Jonathan Evans, PhD, University of Glasgow. jonathamn.evans@glasgow.ac.uk*

Symposium. Novel applications of technology within neuropsychology research and practice
Chair: Coco Bernard
13:15-15:15

Schultheis MT, Jamieson M, Anderson V. Novel applications of technology within neuropsychology research and practice

The field of neuropsychology has been slow to embrace technology and explore its potential to make both assessment and intervention more efficient and practical within the real-world context. This symposium will showcase different applications of technology for scientist practitioners and highlight the methodical and ethical challenges that are inherent with its use. Professor Maria Schultheis will demonstrate the application of virtual reality (VR) for evaluation driving capacity following neurological injury and focus on opportunities for interdisciplinary collaboration and training in this space. Dr Matthew Jamieson will then discuss insights from the ApplTree project; a mobile app designed for individuals with memory impairment after neurological injury or illness, that allows them to schedule and set reminders about everyday activities. He will present observations from conducting digital health interventions research in neuropsychological rehabilitation, and more widely, about the routes to impact when conducting this work. Finally, Professor Vicki Anderson will present on the delivery of e-health services to children and families who find it difficult to attend tertiary centres due to a range of geographical factors, family responsibilities, social disadvantage and psychological trauma associated with return to centres. More broadly, she will explore the need for healthcare to embrace technology in order to assist with connecting patients with providers remotely. The symposium will conclude with a general discussion around the ethical and methodological considerations that surround the use of technology and its applications in health care. Correspondence: *Maria T. Schultheis, PhD, Department Head and Professor, Psychology Department, Philadelphia, USA. schultheis@drexel.edu*

Schultheis MT. Development and application of Virtual-Reality technology in neuropsychology

In our innovative-driven society, new technologies are being developed every day. For neuropsychology, this offers a unique opportunity for expanding our understanding of brain-behaviour relationships. Most notably, technologies can

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allow the integration of current assessment measures with other factors influencing cognition, resulting in a comprehensive evaluation of brain-behaviour relationships. Given the "real world" demands for complex and dynamic cognitive processing, it is arguable that technologies may offer a novel venue for improving overall ecological validity in neuropsychology. The current presentation will demonstrate the application of virtual reality (VR) technology for the evaluation of driving capacity after neurological compromise (i.e., brain injury, concussion). The studies demonstrate the novel metrics of behaviour that are offered with VR and present new methodologies that better quantify the cognitive demands of driving capacity. Additionally, the presentation will focus on opportunities for interdisciplinary collaboration and training, considerations for matching technologies with the needs of neurological populations and future directions for successful integration of technology into clinical practice. Correspondence: *Maria T. Schultheis, PhD, Department Head and Professor, Psychology Department, Philadelphia, USA. schultheis@drexel.edu*

Jamieson M, Cullen B, McGee-Lennon M, Brewster S, Evans J. Observations from the cross-disciplinary ApplTree project.

This talk includes a discussion of observations made during the ApplTree project that we have been working on for four years. ApplTree is a mobile reminding app that allows people to schedule reminders about everyday activities and prompts them at a set time in the future. Many reminding apps like this are available on smartphones and these can be helpful for people with memory impairment after neurological injury or illness. However, these apps are not specifically designed to be accessible for people with cognitive impairments. In the ApplTree project, undertaken jointly by human computer interaction (HCI) and neuropsychology researchers, we aimed to first understand the issues that prevented use of potentially helpful tools and then created and tested features that could overcome these barriers to use. In this talk we will discuss some observations about conducting digital health interventions research in neuropsychological rehabilitation, and more widely, about the routes to impact and the goals of researchers when conducting this work. For example, one challenge we have faced is the difficulty using the standard methodologies from HCI in this work, considering the generally low and slow recruitment and the ethical issues that present themselves. Another relevant challenge for all those undertaking this work in the future is the route to impact in a market saturated with many health apps that claim to be based on research but are not. Correspondence: *Matthew Jamieson, MA Msc PhD, Institute of Health and Wellbeing, University of Glasgow, Gartnavel Royal Hospital, 1055 Great Western Rd, Glasgow G12 0XH Matthew.Jamieson@Glasgow.ac.uk/ matt.jamieson@live.co.uk*

Anderson V. Can advances in digital health and E-Health improve assessment, intervention and outcomes for children with brain injury and their families?

Working with children and families with serious illness and injury is complex. Even when high quality post-injury care is available, families often find it difficult to take full advantage due to geographical factors, family responsibilities, social disadvantage and psychological trauma associated with return to tertiary centres. As a result, evidence regarding child outcomes and impact of post-injury interventions is limited by inclusion bias towards socially advantaged, well functioning families living close to city centres. In fact, it could be argued that our interventions are not reaching the children and families most in need. The explosion of digital health and e-health technology provides an exciting and innovative opportunity to extend the reach of our post-injury assessment and intervention. These approaches facilitate engagement of mothers and fathers as well as their injured child or adolescent. To date, despite the face validity of available technology, the evidence base for these approaches is not always robust, and robust validation is critical. Several digital and e-health interventions will be introduced, focusing on child and family outcomes and early findings from trials using these methods will be described, along with leanings for moving to an e-health model will be illustrated. Correspondence: *Vicki Anderson, PhD, Royal Children's Hospital, Murdoch Childrens' Research Institute & University of Melbourne, Melbourne, Australia. vicki.anderson@rch.org.au*

Poster Presentations. Movement Disorders/Cancer/Medical Disorders/DMG/Toxin-Related Disorders 13:15-15:15

Gopolang S, Marobela S, Mbakile-Mahlanza L. The effects of alcohol consumption on working memory

Background: Working memory plays a central role in domains of higher cognition and several studies indicate that it is affected by numerous factors; including drug and alcohol use. Previous studies conducted in western societies regarding the impact of alcohol on working memory have been inconclusive. Although alcohol use among the youth remains a prevailing social problem in the community of Botswana, there has been limited research investigating its effects on working memory. The aim of this study was therefore to explore the impact of alcohol consumption on working memory among University of Botswana students. Methods: In this cross-sectional study, a total of 100 participants (55 females) completed the AUDIT and scores were grouped into four risk-levels of alcohol dependence (with lower scores implying low risk and higher scores implying greater risk of alcohol dependence). Participants also completed neuropsychological measures of working memory including the STROOP task and selected subtests from the WAIS-IV, namely; Arithmetic, Letter-Number Sequencing and Digit Span. Results: Results indicated that alcohol consumption did not have an impact on participants' working memory. There were no statistically significant

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differences between the participants' AUDIT scores on the combined dependent variables, F (6, 190) = 1.11, p = 0.36; Wilk's Lambda = 0.93; partial eta squared = 0.03. In addition, no impairments were evident on interference. Conclusion: Although this study did not demonstrate a significant negative impact of alcohol on working memory, it would be important for future research to examine the influence of other factors including family history of alcohol use and use of other drugs as these may have an effect on the outcome. Given that alcohol consumption among university students is a major concern, this study may help to stimulate research in this area so as to increase our understanding of its effects on learning and intellectual development of students. Correspondence: *Sally Gopolang, Intern at the University of Botswana, Private Bag 05, Molepolole Gaborone, Botswana. sallymumsygopolang@gmail.com*

Ipser J, Stein D, Gouse H, Freeman C, Joska J. Childhood adversity and hippocampal volume associated with poorer visuospatial memory in binge drinkers

Background: Exposure to early life adversity and alcoholism have both been associated with abnormalities in hippocampal structure and function. The purpose of the current study was to assess whether heavy episodic drinking (HED) and early life adversity in adults interact to predict differences in hippocampal volume and associated memory function. Methodology: Non-parametric bivariate statistics were used to compare Childhood Trauma Questionnaire (CTQ) total scores and bilateral hippocampal volumes (extracted from T1 MRI scans using FreeSurfer v. 5.3) between 19 HED participants and 15 light or non-drinking (LND) adult subjects recruited from a community clinic in Cape Town. Associations between these outcomes and performance on the CANTAB Paired Associates Learning (PAL) visuospatial memory task were also assessed. Results: No differences in CTQ total scores or hippocampal volumes were observed between the HED and LND groups. In HED participants only, higher CTQ scores were associated with smaller left hippocampi (Spearman rho = -0.52, p = 0.02); smaller hippocampal size in turn paradoxically predicted poorer memory function in this group on a number of PAL outcomes, including initial number of stages completed (right: Rho = -0.57, p = 0.02; left: Rho = -0.438, p = 0.08). Conversely, higher CTQ scores predicted (worse) memory performance in LND participants only. Conclusion: The data presented is consistent with a possibly synergistic effect of alcohol on the developmental sequelae of early stress on the brain; furthermore, they support partly independent mechanisms linking visuospatial memory processes to hippocampal volume and early adversity in binge drinkers. Correspondence: *Jonathan Ipser, PhD, University of Cape Town, E36A Groote Schuur Hospital, Department of Psychiatry and Mental Health, Observatory, 7925 Cape Town, South Africa. jonathan.ipser@uct.ac.za*

Troster A, Abbott A, Ponce F, Hanson K. A comparison of neuropsychological outcomes of pallidal and subthalamic deep brain stimulation for Parkinson's Disease

Objective: To compare the neurobehavioural outcomes of internal globus pallidus (GPi) and subthalamic nucleus (STN) deep brain stimulation (DBS) for Parkinson's disease (PD) when electrodes are implanted under general anesthesia. Background: DBS for PD is deemed relatively safe from a neurobehavioural standpoint. One point of controversy is the relative safety of "awake" GPi vs STN DBS: whereas large trails indicate there to be no differences between the treatments in neurobehavioral outcomes, several smaller studies and meta-analyses hint that GPi DBS may be cognitively safer. No reports have compared outcomes after electrodes were implanted under general anesthesia using direct anatomical targeting. Methods: Patients with PD underwent electrode implantation (34 GPi; 29 STN) and neuropsychological (NP) evaluation before and after surgery (test-retest interval about 12 months). Test scores were analyzed via 2x2 ANOVA (Time x Group). Results: Significant declines were observed on a cognitive screening instrument (Mattis Dementia Rating Scale (DRS) due to worse verbal fluency); lexical, semantic and action (verb) verbal fluency; on the Stroop task; and delayed visual recall. Mild improvements were seen in delayed prose recall and visual confrontation naming. Anxiety symptoms decreased and quality of life improved. Only on the DRS Initiation/Perseveration scale was there an interaction between time and group. Conclusions: DBS under general anesthesia appears relatively safe from a cognitive standpoint, with declines observed in the same domains (fluency, Stroop) as after awake surgery. Outcomes are similar in STN and GPi DBS groups, at least in our hands. Furthermore, both groups show improvements in anxiety and quality of life. Correspondence: *Alexander Troster, PhD. alexander.troster@dignityhealth.org*

Cant R, James A, Devenney G, Harris P, Hastings K, Woods J. The silent companion: Sensed presence in Parkinson's Disease

Background and aims: 'Sensed presence' (SP) refers to the subjective feeling of a nearby sentient entity, without verifiable physical presence. SPs have been reported in a range of situations including sleep paralysis, extreme survival conditions, bereavement, and neurological disorders. A particularly high prevalence (estimated from 29-50%) has been noted among individuals with Parkinson's Disease (PD). Using a sensorimotor "robot", Blanke *et al*. (2014) were able to reliably induce SP feelings in healthy subjects via the generation of conflicting sensorimotor signals, incompatible with physical self-touch. This supports the theory that disturbed self-body-mapping underlies SP phenomenon. However, literature has suggested that SP in PD corresponds to the perception of a person distinct from oneself (Fenelon *et al.* 2011) and as a result, may be viewed as a 'social' hallucination'. In order to understand how SPs may differ across contexts and within PD, an integration of different levels of analysis is likely to be crucial. SPs in PD are of particular interest given their possibility to act as a

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prognostic marker for visual hallucinations (Kataoka & Ueno, 2015) and cognitive decline (Wood *et al.,* 2015). Methods: Case series of individuals with PD reporting sensed presence. Results and conclusions: Here we present a series of cases representing a variety of clinical presentations of SP in patients with PD and discuss them in relation to current theories and the prognostic potential of subsequent visual hallucinations and cognitive decline. Correspondence: *Richard Cant, PhD, Leeds Community Healthcare NHS Trust, Unted Kingdom. r.cant@nhs.net*

Krengel M, Yee M, Janulewicz P, Sullivan K. Redefining Gulf War veterans' illness

Veterans from the 1991 Gulf War (GWV) continue to self-report physical, emotional and cognitive symptoms 26 years since their deployment. Surveys of health symptoms were collected over five different time points, in a large cohort of GWV followed since the early 1990s, the Fort Devens Cohort (FDC). The FDC is one of the few longitudinal studies of GWV and the only cohort to our knowledge that was designed as a prospective study. Recently, the Institute of Medicine (IOM) reported the need for updated case definitions of Gulf War illness (GWI) to improve consistency of treatment. Our lab has measured the similarities and differences in cognitive and other health symptoms reported from members of the FDC. The Health Symptom Checklist (HCL) was administered, and includes measures of cognitive function such as learning, memory, and attention, in addition to physical and emotional symptoms such as fatigue, irritability and anxiety. Preliminary data from the most recent Time 5 questionnaire data has documented that individuals are still reporting significant health concerns, including problems with short-term memory, difficulty learning and poor concentration such that 60% of the sample reported no improvement in cognitive status over time. In addition, close to 20% of the sample has reported increased symptom reporting, including fatigue and irritability. Very few (< 1%) of our sample reported symptom improvement over time. Data will be discussed as they relate to the consistency of case definitions and potential for treatment. Correspondence*: Maxine Krengel, PhD, VA Boston Healthcare, 150 South Huntington Ave 116B Boston, MA 02130 USA. mhm@bu.edu*

James A, Hastings K, Devenney G, Harris P, Cant R, Woods J. Psychosocial impact of impulse control disorders in Parkinson's Disease

Objective: Korsakoff's syndrome (KS) is characterized by profound anterograde and retrograde amnesia for contextual, episodic information. So far only a few studies have examined memory training in this patient group, with mixed results. This controlled study examined an associative mnemonic strategy training in KS with the aim to improve memory function. Methods: Fourteen KS patients were randomized to a mnemonic strategy training plus treatment as usual (TAU; N = 7) or TAU only (music/occupational therapy; N = 7). A baseline cued-recall assessment of object-location memory (OLM) was performed on day 1, followed by three 30-min mnemonic strategy training sessions for the mnemonic group over the subsequent days (2-4). On day 5, a post-intervention OLM assessment was performed in both groups, as well as a one-week follow-up OLM assessment. All assessments used untrained object-location associations (near transfer). Results: Repeated-measures GLM neither revealed overall changes over time (p = .218), nor a significant interaction between time and group (p = .77). A marginally significant group effect was found (p = .073), but adjustment for baseline performance did not alter the results. Discussion: Although previous research in aMCI patients has shown beneficial effects of mnemonic strategy training, these findings could not be extended to KS. This may be related to the small sample size, despite a within-subject design, the OLM paradigm as outcome measure that may have been insensitive to subtle improvements, or the profound context-memory deficits in KS, possibly limiting the effects of strategy training in those with severe memory impairment. Correspondence: *Andrew James, PhD, Leeds Community Healthcare NHS Trust Leeds NHS CNRT St Mary's Hospital Green Hill Road LS12 3QE. andrew.james7@nhs.net*

Barajas-Toledo D, Rodriguez-Camacho M, Jaimes-Bautista A, Rodriguez-Agudelo Y. Evaluation of semantic memory in patients with Parkinson's Disease

Deficits in tasks assessing semantic memory (SM) in patients with Parkinson's disease (PD) have been described; however, it is unclear if they are associated with failures in memory system or with executive functions (EF) that are involved in the information retrieval. Objective: To evaluate SM and EF, and to explore a possible correlation between these processes. Procedure: Eleven non-demented PD patients (mean age 62.5, S.D.7.5; stage < 3 in H&Y scale) were evaluated; all were taking antiparkinsonian medication and evaluated during the "on" phase. The neuropsychological tests employed were: Boston Naming Test (BNT), Semantic Verbal Fluency Test (SVF) (animals), Neuropsi: Attention and Memory subtests, Modified Wisconsin Card Sorting Test (M-WCST) and Stroop Colour-Word Interference Test. Results: Moderate correlations between total words in SVF and total errors in M-WCST (r = -.625, p = .040), and between correct responses in BNT and perseverative errors in M-WCST (r= -.632, p = .037) were found with Pearson's correlations. Qualitatively, it was observed that patients in BNT named more words with phonemic cues than semantic ones. Conclusions: SM deficits were not found; however, the correlations found suggest that SM failures described in literature, could be related to difficulties in retrieving information due to poor executive control. It is possible that SM deficits could be present in later disease stages. CONACYT project 240856 Correspondence: *Barajas-Toledo Daffne, Bachelor of Psychology, Universidad Nacional Autonoma de México, Francisco Clavijero 25 (Department Salamanca 501), Transito, Cuauhtemoc, Postal Code 06820, Mexico City, Mexico. daffne.bar.tol@gmail.com*

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Amidi A, Wu L, Clausen C, Zachariah R, Dements D, Agerbaek M. Is APOE4 a risk factor for chemotherapy-induced cognitive impairment and increased immune response in cancer patients undergoing treatment?

Purpose: To prospectively explore the association between the Apolipoprotein ε4 (APOE4) polymorphism and changes in cognitive functions, as well as inflammatory and proinflammatory immune markers in testicular cancer (TC) patients undergoing chemotherapy. Rationale: APOE4 is considered a well-known risk factor for the development of mild cognitive impairment and Alzheimer's disease and has been associated with an increased immune response. Furthermore, evidence suggests that APOE4 may be a moderating risk factor for chemotherapy-induced cognitive impairment in breast cancer patients. Methods: Twenty-two men recently diagnosed with TC provided blood samples for APOE genotyping and repeated high-sensitive assessments of relevant immune markers (C-reactive protein, Interleukin-6, Tumor-necrosis factor-α) prior to chemotherapy and three months after completed treatment. Furthermore, participants underwent repeated neuropsychological assessments. A regression-based approach was used to calculate changes in cognitive domain scores from pre- to post-treatment. Changes in assessed immune markers were combined to create a single measure of the overall direction and magnitude of change. Results: Seven participants (32%) were carriers of the APOE4, while 15 (68%) were not. Bootstrapped between-group tests indicated that APOE4 carriers evidenced accelerated decline in processing speed ($p = .016$) and global cognition ($p = .007$) compared with non-carriers. Furthermore, trends were found for working memory ($p = .065$) and verbal fluency ($p = .062$). A trend towards increased inflammatory response was observed in carriers of APOE4 ($p = .054$). Conclusion: In this sample of TC patients, we found that APOE4 may be a risk factor for treatment-induced cognitive impairment as well as increased immune response. Large-scale studies are needed to consolidate these findings. Correspondence: *Ali Amidi, PhD, Unit for Psycho-oncology and Health Psychology, Department of Oncology, Aarhus University Hospital, Bartholins Allé 9, Aarhus C, 8000. ali@oncology.au.dk*

Invited Symposium. The Vascular-Alzheimer's Continuum and Unusual Dementias
Chair: John Joska
15:45-17:45

Combrinck M. An unusual form of vascular-related cognitive impairment: clinical, radiological and neuropathological findings

A 75-year-old man with risk factors for vascular disease including type II diabetes mellitus, hypertension and a history of cigarette smoking, presented with a six month decline in cognitive function. He had a prominent dysexecutive-type dysnesia. He subsequently developed urinary incontinence as well as Parkinsonian-like features with postural instability and difficulty walking. The clinical and radiological findings will be presented, together with the differential diagnoses as the symptoms and signs evolved. Finally, the postmortem brain histopathological findings will be reported. Correspondence: *Marc Combrinck.* marc.combrinck@uct.ac.za

Thomas K. Two cases of primary progressive aphasia: Neuropsychological assessment in a state hospital's memory clinic

In this presentation, two cases of PPA will be presented and discussed from the neuropsychological point of view. In particular, features that distinguish this type of dementia from the more commonly seen Alzheimer type and vascular dementias will be discussed. A brief overview of the natural history and course from the neuropsychological perspective will be provided. Correspondence: *Kevin G.F. Thomas, PhD, Department of Psychology, University of Cape Town, PD Hahn Building, Rondebosch 7701, South Africa. kevin.thomas@uct.ac.za*

Groenewald L. Normal pressure hydrocephalus presenting with psychiatric symptoms

Normal Pressure Hydrocephalus (NPH) is one of the potentially reversible causes of dementia and is misdiagnosed in the majority of cases. Cognitive deterioration is one of the core features of NPH. However, NPH could also present with other psychiatric symptoms such as apathy, depression and psychosis. The cognitive and psychiatric aspects of NPH will be discussed using a case study of a patient with NPH who presented with psychiatric symptomatology. Correspondence: *Lina Groenewald PhD, Stellenbosch University. lina.groenewald@gmail.com*

Joska J. HIV dementia: Addressing the burden of disease in South Africa

HIV dementia is the most severe form of HIV-associated neurocognitive disorder (HAND). In untreated disease, it affects up to 15% of individuals, while in treated disease, this falls to < 5%. Impairments of memory, executive function and psychomotor speed are typical in HIV dementia. While the benefits of anti-retroviral therapy (ART) are clear, several challenges remain, if we are to address the burden of disease of HIV dementia in a resource-limited setting such as South Africa. Firstly, more than half of HIV infected individuals do not access ART. Several critical gaps in the care continuum exist, so that we have two epidemics of both treated and untreated disease. Secondly, there is no systematic way to screen for HIV dementia in clinical settings, because staff are over-burdened with treatment enrolment and "core" activities. Thirdly, for individuals in care and on effective ART, treatment options for persistent HIV dementia are few. The mechanisms of persistent HIV dementia are unclear; the central nervous system is hard to study; and effect sizes of treatments difficult to detect. Correspondence: *John Joska, PhD, University of Cape Town, Dept Psychiatry and Mental Health Groote Schuur Hospital, Anzio Road, Observatory 7925, Cape town, South Africa. john.joska@uct.ac.za*

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Paper Presentations. Functional Imaging/Language and Speech Functions/Learning Disorders 15:45-17:45

Kolovopoulos D, Jamieson M, Williamson J, McGill M, Wilson G, Evans J, Brewster S. Testing the impact of augmented reality on everyday executive task performance using a virtual reality multiple errands test

Virtual errands tests aim to examine cognitive abilities during everyday tasks in a controlled but ecologically valid way. Recent developments with virtual reality (VR) technology such as the HTC Vive now allow tasks to be created in which the user performs actions and interacts with virtual objects in realistic, immersive but safe environments. Furthermore, within this VR environment, augmented reality interventions (ARI) that can assist people with these tasks (e.g. those provided by Google Glass or similar technology) can be studied. We have developed a VR shopping task that requires the user to multitask to purchase 10 pre-identified items within a budget (£40). Healthy participants (n = 18) completed the task with and without ARI in a counterbalanced design. The ARI was a shopping list that appears in the field of view and the price and name of every object presented in a space over the object when picked up. Budget adherence (amount over or under budget) was £4.11 (SD = 3.35) without the ARI and £2.11 with the ARI (SD = 1.79). A within subject t-test showed that people performed significantly better with the ARI than without (t = -2.44, df = 17, p = 0.026). Our VR errands task was not performed at ceiling level with or without the ARI. This study with cognitively healthy participants illustrates the potential utility of augmented reality interventions for supporting people with cognitive impairments. The VR environment can be controlled for research experiments and assessments. Our goal is to create open source errand tests for clinicians, designers and researchers. Correspondence: *Matthew Jamieson, MA Msc PhD, Institute of Health and Wellbeing, University of Glasgow, Gartnavel Royal Hospital, 1055 Great Western Rd, Glasgow G12 0XH.Matthew.Jamieson@Glasgow.ac.uk/matt.jamieson@live.co.uk*

Halliday D, Mulligan B, Garrett D, Schmidt S, Garcia-Barrera M, Hundza S, Stawski R, MacDonald S. Using functional near infrared spectroscopy to index neural variability in older adults during an executive function task

Variability in neural activity has historically been treated as noise, in favour of computing central tendency. Recently, researchers have shown that 1) variability and mean confer different sources of information, 2) increased variability in neural activity is associated with superior behavioural performance, and 3) that it decreases during late life. In spite of evidence, it is less clear whether these positive associations are driven by within- or between-person factors. Further, the majority of age-related variability findings have been found using fMRI, with comparatively low temporal resolution. This investigation employed the temporal sampling advantages of fNIRS to derive two operationalizations of cerebral oxygenation, representing mean and variability in neural activity, and then contrasted these estimates as predictors of cognitive function. Twenty-five eligible community-dwelling older adults (71-81 years old) completed a test of cognitive interference (the Multi-Source Interference Task) while undergoing fNIRS recording from bilateral prefrontal regions (BA10 & 46). Time-varying covariation models were employed to estimate the effects of cerebral oxygenation on behavioural performance. Mean effects at the between-person level indicated that greater concentrations of HbO were associated with slower (γ ranging from 59.55 to 68.46, ps < .05) and less accurate (γ ranging from -0.02 to -0.10, ps < .05) performance. Greater HbO variability at the between-person level was associated with slower performance (γ ranging from 0.39 to 0.66, ps < .05), but at the within-person level was associated with faster performance (γ = 0.09, p < .05). These findings suggest that neural variability may be operationalized successfully using fNIRS, and that patterns should be considered both between- and within-persons. Correspondence: *Drew Halliday, MSc, Psychology, University of Victoria, Department of Psychology, University of Victoria, PO Box 1700 STN CSC, Victoria, B.C. V8W 2Y2. drewh@uvic.ca*

Castro SL, Mesuita A. Vocal emotion and vocal identity recognition in adult dyslexia

Do you hear it in her voice? The recognition of vocal emotions, just like that of vocal identity, is affected by language-related factors: an advantage of the native vs an unknown language has been found in both cases. Difficulties in the recognition of voice identity have been associated with dyslexia, but it is unknown whether dyslexia would also affect processing of other aspects of vocal expression such as emotional prosody (vocal emotions). Here we will review available evidence on the link of dyslexia with voice processing, and report a study with adult normal readers and adults with dyslexia where we examined the recognition of seven voice qualities (afraid, angry, disgusted, happy, sad, surprised and neutral) and of voice identity embedded in the native language (Portuguese) or in an unknown language (Mandarin Chinese). We replicated the advantage of native language and found a significant effect of group (advantage of the no-dyslexia adults; no interaction) in the recognition of vocal emotions, but not of voice identity. The role of linguistic and of auditory factors as potential mechanisms accounting for these findings will be discussed. Correspondence: *Sao Luis Castro, PhD, University of Porto, FPCEUP Rua Alfredo Allen 4200-135 Porto Portugal. slcastro@fpce.up.pt*

De Sousa D. Bilingualism, cognition and language-learning in monolingual and bilingual children in South Africa

This study sought to expand knowledge in the field of second language reading acquisition and language of instruction by examining the impact of language-related factors on the cognitive development and literacy competence of monolingual and bilingual children in the South African context. An English-speaking monolingual group with

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English as the language of instruction (N = 100) was compared with a Zulu-English bilingual group with Zulu as first language (L1) speaking proficiency and English as second language (L2) literacy experience (N = 100) on measures of reading, phonological awareness, vocabulary skills, and working memory. Performance in cognitive processing and reading tasks of these two groups was compared to an Afrikaans-English bilingual group (N = 100) with dual medium instruction. Tests of language proficiency confirmed that the Afrikaans-English bilinguals were balanced bilinguals and that the Zulu-English bilinguals were partial bilinguals. Dual medium learners outperformed both monolingual learners and L2 English with L1 Zulu-speaking proficiency learners on tests of phonological awareness, working memory, and reading comprehension. They also reached similar competency levels in tests of vocabulary knowledge compared to monolingual English (L1) learners. These differences translated into different relationships and strengths for reading attainment. These findings provide support for a language-based and context-dependent model of reading attainment for South African children. Bilingual children who are exposed to dual medium reading instruction programmes that value bilingualism philosophically and support it pedagogically create optimal conditions for high levels of cognitive development and academic achievement, both in the first and in the second-language. Correspondence*: Diana De Sousa, PhD, The South African College of Applied Psychology, 13 Rosemary Road Roseacre, Johannesburg 2197, South Africa. diana@sacap.edu.za*

Fletcher J, Morris R. Neuropsychological and neuroimaging correlates of inadequate responders to instruction

Objective: In a series of studies, elementary school children received neuropsychological and neuroimaging studies after an intensive reading intervention. In this study, we pooled samples to evaluate classifications of adequate and inadequate responders to intervention. We hypothesized that there would be distinct profiles validating instructional response as an inclusionary criterion for the identification of reading disabilities. Method: Through whole school screening, children in grades 1-3 at risk for reading disabilities were randomly assigned to receive or not receive a small group reading intervention. After the intervention, assessments of instructional response were administered. Those below the 25th percentile were designated inadequate responders. The entire sample received a neuropsychological assessment and structural and functional neuroimaging for comparisons of inadequate and adequate responders and typically achieving students. Results. MANOVAs across the neuropsychological tests were significant ($p < .05$), showing clear differentiation of groups (typicals > responders > inadequate responders) in level of performance, but no qualitative differences in the shape of the profiles. Similarly, on functional neuroimaging of word and sentence reading tasks, responders showed development of the dorsal and ventral networks mediating reading skills, which was not apparent in the inadequate responders. Cortical thickness was most greatly reduced in the ventral components of the network in inadequate responders. Conclusions: There was clear differentiation of adequate and inadequate responders on neuropsychological and neuroimaging assessments. The differences were quantitative and consistent with a continuum of severity and not with qualitative differences, supporting a dimension conceptualization of instructional response and reading disabilities. Correspondence: *Jack Fletcher, PhD, Department of Psychology, University of Houston, 3695 Cullen Heyne 126 Houston TX 77204-5052, United States. jack.fletcher@times.uh.edu*

Naidoo R. When does a small lag become a delay? Identification of early markers of learning disabilities

The first warning signs of an emergent learning disability are often missed and often, by the time the child is first diagnosed with a learning problem, the child has been subject to significant collateral damage in self-esteem and self-efficacy, motivation, planning and ambition. A challenge for early caregivers (physicians, preschool teachers, and parents) is knowing when a minor lag is something to investigate further. The roles of processing speed, executive functioning, visual spatial dysfunction, and working memory across all learning difficulties will be explored in terms of their impact on the acquisition of learning. These will be discussed in terms of interventions that are available in terms of effacacy and empirical evidence for positive outcomes. The final part of this talk will focus on the how to develop a system of advocacy for early identification and intervention for these barriers to learning. Correspondence: *Reshma Naidoo, PhD, Nicklaus Children's Hospital, 2823 Day Avenue, Miami, United States. reshma.naidoo@mch.com*

Symposium. Evidence-based Practices in Neuropsychology: Current Status and Future Directions
Chair: Gordon Chelune
15:45-17:45

Loring D. Where is the evidence for evidence-based practice?

Evidence-based practice relies on the availability of the best available evidence, although at times the best available evidence is difficult to determine. Unfortunately, when reviewing research reports, the amount of critical detail necessary to make informed judgments regarding study breadth and quality is often incomplete. To increase research reporting transparency, explicit reporting standards have been developed. For neuropsychology, STROBE (STrengthening the Reporting of Observational studies in Epidemiology) is appropriate since neuropsychology reports are often based upon non-funded studies of patient samples. This presentation will highlight the relevance of the STROBE checklist in identifying issues to help readers establish generalizability of particular study findings and to assist in determining the relevance of a particular study's findings to a specific clinical question. We will also discuss how STROBE reporting facilitates meta-analytic approaches that summarize findings across multiple studies and which can provide estimates of effect sizes from multiple reports, but also highlight common misapplication of STROBE in

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which "methodological quality" and "reporting quality" are treated as equivalent. When there are sufficient numbers of studies, meta-analytic reviews are considered Class I levels of evidence. Despite high levels of evidence provided by meta-analytic reviews, inherent limitations of systematic reviews will also be discussed that include evaluation of effects from low or poorly powered studies to the file drawer problem in which null study results are not published, and consequently, are not readily available for inclusion in systematic reviews of the literature. Correspondence: *David Loring, PhD, Neurology Department, Emory University, 12 Executive Park Atlanta GA 30329, Atlanta. dloring@hsc.utah.edu*

Chelune G. Evidence-based test selection and choice of cutoff scores: What is the question?

Evidence-based practices (EBP) call for less emphasis on intuition and unsystematic clinical experiences and greater use of empirical research to guide clinical decision making. In diagnostic situations, good EBP requires the clinician to select test procedures based on available research that can best address specific clinical questions in a valid fashion and then to apply the test results in a way that reduces diagnostic uncertainty and best informs clinical decisions about the individual patient. This presentation illustrates that careful consideration of the purpose(s) of the evaluation is critical to evidence-based test selection and choice of cut-off scores for defining positive and negative outcomes. Using pre- and post-surgical data from a cohort of 109 consecutive patients with intractable right (n = 57) or left (n = 52) temporal lobe epilepsy, it is demonstrated that tests that purportedly measure the same cognitive function can have either comparable receiver operating characteristics (AUC = .652 versus .612) or significantly different characteristics (AUC = .788 versus .618) depending on the diagnostic question addressed. Additionally, the choice of cut-off scores to denote a positive versus negative finding depends on whether it is preferable to optimize the overall correct hit-rate or whether the clinician wants to rule-in or rule-out the condition of interest. The issues and methods presented here generalize to EBP in general. Correspondence: *Gordon Chelune, PhD, University of Utah School of Medicine, Ctr. for Alzheimer's Care, Imaging & Research 650 Komas Dr, Ste., 106A Salt Lake City, Utah 84108 USA. gordon.chelune@hsc.utah.edu*

Miller L. Performance-based measures of functional independence: Relationship to cognitive functions

Consistent and inevitable changes occur in many of the most basic cognitive processes as we age, including memory, information processing, attention to multiple stimuli, maneuvering effectively in space, and even some aspects of language such as naming and language fluency. It makes sense that these changes must affect our ability to function independently. However, the extant literature on this topic is controversial. While many studies find some relationship between age-related cognitive changes and subsequent Functional Independence (FI), the size and even direction of those relationships are contentious, and surprisingly modest relationships have been reported. Our data suggest that this inconsistency and the finding of low effects sizes are based at least in part on the measurement methods. We present data from multiple studies from our laboratory arguing that performance-based FI evaluation provides different/better information regarding the cognition-FI relationship and accounts for greater amounts of variance within their association. These findings have implications on not only how we assess aging effects, but also how we assess the impact of early identification of dementing illnesses in older adults. When more valid data on FI are acquired, such as through performance-based methods, more frequent and stronger cognition FI associations are found. Thus, previous views of only a modest relationship, as well as views of a lack of functional impairment in Mild Cognitive Impairment (MCI), need to be revised. Finally, we argue that this should influence policy, diagnostics, and even evaluation of decision-making authority when it comes to older adult assessment. Correspondence: *Lloyd Mille, PhD, University of Georgia, 110 Hooper Street, Psychology Bldg, Rm 163, University of Georgia Athens, GA 30605, United States. lsmiller@uga.edu*

Paper Presentations. HIV
15:45-17:45

Rourke SB, Rachlis A, Gill MJ, Carvalhal A, Atkinson M, Murphy C, Bekele T, Power C, Brunetta J, Robbins R, Sota T, Marcotte T, Cysique L, Arbess G, Kovacs C. Concurrent validity of four screening tests for HIV associated neurocognitive disorders (HAND): Sensitivity, specificity and classification accuracy

Background: Effective cognitive screening instruments are needed to differentially assess and manage milder forms of HIV-associated neurocognitive disorders (HAND). We assessed concurrent validity of four screening tests against the gold standard for HAND diagnosis. Methods: Sample included 220 HIV-positive adults (mean age: 51 years; 86% men) attending a clinic in Toronto, Canada. Four screening tests: Cogstate Brief Battery (CBB), HIV Dementia Scale (HDS), Computer Assessment of Mild Cognitive Impairment (CAMCI), and Montreal Cognitive Assessment (MoCA) were administered. Impairment was defined as raw score of > 10 (HDS), ≥ 30 percentile (CAMCI), a score of > 26 (MoCA), and impairment in two or more domains (CBB). Participants completed neuropsychological battery assessing processing speed, attention/working memory, learning/memory, and executive functions. Clinical HAND diagnosis was made according to Antinori (2007) criteria. Validity of screening tests was assessed against the gold standard. Results: 129 participants (59%) had a clinical diagnosis of HAND (ANI = 20; MND = 94; HAD = 15). Sensitivity estimates were: 72% (MoCA), 61% (CBB), 42% (HDS), and 31% (CAMCI). Specificity estimates were: 98% (CAMCI), 95% (HDS), 82% (CBB), and 73% (MoCA). AUC estimates were 0.723 (MocA), 0.714 (CBB), 0.682 (HDS), and 0.644 (CAMCI). Combining of any two screening tests (test positive by either one or both tests) resulted in modest classification accuracy improvements (AUC ranges: 0.736-0.758). All four screening tests were better at detecting symptomatic HAND (10%-32% higher

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AUC) compared to non-symptomatic HAND. Conclusions: Our results suggest that the MoCA and CBB screening tests have only modest global classification accuracy for assessing mild HAND in people with HIV. Correspondence: *Sean B. Rourke, PhD, University of Toronto. sean.rourke@utoronto.ca*

Rourke SB, Rachlis A, Sota T, Kovacs T, Kovacs C, Bekele T, Nam S, Brunetta J, Cysique L, Gill MJ, Carvalhal A, Arbess G. Persistence of neurocognitive impairment and milder forms of HIV-associated neurocognitive disorders (HAND) over 20 years in the HAART era: Evidence from St Michael's Hospital Neuro HIV Clinical Cohort (Toronto, Canada)

Background: Although mild forms of HIV-associated neurocognitive disorders (HAND), i.e., Asymptomatic Neuropsychological Impairment (ANI) and Mild Neurocognitive Disorder (MND)], remain prevalent in HAART era, there is an ongoing debate around the clinical significance of ANI and risk for symptomatic HAND. We examined the trend of neurocognitive impairment (NCI) and HAND in a prospective cohort of over 1 000 HIV-positive people in Toronto, Canada. Methods: A neuropsychological battery that assessed attention/working memory, complex psychomotor skills, verbal/visual learning and memory, and executive functioning was administered. Beck Depression Inventory and Patient Assessment of Own Functioning Inventory were also administered. NCI was determined using Global Deficit Score cut-off of ≥ 0.5 and those with NCI were classified into ANI, MND, or HIV-associated Dementia (HAD) using Antinori *et al*. (2007) criteria. We included 788 patients (91% men; mean age = 45.4 years) in final analyses (Epoch 1: 1996-2000, n = 174; Epoch 2: 2001-2005, n = 217; Epoch 3: 2006-2010, n = 188; and Epoch 4: 2011-2016, n = 209). Results: Overall, 45% of patients had HAND (n = 358; ANI = 17%; MND = 23%; HAD = 5%). HIV viral load outcomes (% undetectable) improved significantly ($p < 0.001$) between Epoch 1 (37%) and 4 (68%). Depression (range 39-45%) and subjective cognitive complaints (range 48-54%) remained stable. NCI rate remained stable in depressed (46%-48%), but increased slightly (33% to 44%) in non-depressed patients. Prevalence of HAND increased marginally ($p = 0.11$) from 39 to 46% [ANI: 14 to 17%; MND 21 to 25%; and HAD remained stable (4-5%)]. Conclusions: Despite improvements in clinical outcomes and relatively stable levels of depression, rate of ANI/MND remain prevalent over the 20-year period. Further work is underway to examine prospective changes in HAND and the effects of aging/comorbidities on ANI/MND. Correspondence: *Sean B. Rourke, PhD, University of Toronto. sean.rourke@utoronto.ca*

Motswai P, Cassimjee N, Jedlinski S. Older adults with HIV: Neuropsychological functioning and health-related quality of life

The wider availability of anti-retroviral therapy has resulted in a concomitant increase in adults aging with HIV and the persistence of milder forms of neuropsychological impairment in this cohort. This study investigated a) the differences in neuropsychological functioning between HIV positive older adults (HIV+) and an HIV negative (HIV-) matched control group and b) the relationship between health-related quality of life (HRQoL) and neuropsychological outcomes in older adults with HIV. Participants from a semi-urban community clinic volunteered to participate in the study. The performance of fifty participants (33 HIV+ and 17 HIV-) who met the inclusion criteria were compared on the following measures: Dementia Rating Scale-2, the Stroop Colour and Word Test, the Symbol Digit Modalities Test and the D-KEFS Trail Making Test. Mann-Whitney U test comparison results following bootstrap analysis indicated that the HIV positive group had poorer performance profiles in global cognitive functioning, memory, executive functioning, visuoconstruction ability, psychomotor functioning and processing speed in comparison to the HIV negative group. Significant associations were found between the EuroQol-5 dimension 5-level (EQ-5D 5L) HRQoL measures of anxiety/depression, pain/discomfort and self-care, and neuropsychological performance. Exploratory cluster analysis revealed that age and clinical features have a moderating influence on the relationship between HRQoL and neuropsychological functioning. The findings suggest that a better understanding of the neuropsychological profiles of adults aging with HIV is needed to inform integrated intervention strategies specific to addressing the health care needs of this subgroup. Correspondence: *Phenyo, K Motswai, MA Research Psychology, Psychology Department, University of Pretoria, 2 Lynnwood Road, Pretoria, 0002, South Africa. phenyo.molamu@gmail.com*

Arends J, Hakkers C, Beunders A, Ensing M, Barth R, Boelema S, Devillé W, Tempelman H, Coutinho R, Hoepelman A. Neurocognitive impairment has a high prevalence in a sub-Saharan HIV-positive population compared to HIV-negative controls; the MoCA-Basic is not an optimal screening tool in this setting

Background: HIV Associated Neurocognitive Disorders (HAND) is a frequently occurring comorbidity in HIV-infected patients. It's diagnosed by a NeuroPsychological Assessment (NPA). The varying prevalence rates reported in resource-limited settings are due to difficulties in NPA and lack of reliable culture- and language-appropriate normative data. Easy to use screening tools are needed in these settings. Methods: cross-sectional case-controlled clinical trial in 44 HIV+ patients (stable cART with a CD4 count over 100/mm3) and 73 HIV- controls completing an NPA and a cognitive screening tool (MoCA-B). Published normative data, as well as the age-adjusted data from our own HIV-negative control group were used to calculate Z-scores from the NPA raw scores to diagnose HAND. Results: 117 patients (24.6% mage, mean age 35.5 years, and mean years of education 10.2) were included. HAND prevalence was high in HIV+ patients (66%) when calculating Z-scores using published normal data. However, prevalence was only 48% when Z-scores were calculated using the data from our own HIV- cohort. There was a moderate correlation between MoCA-B score and NPA total Z-score (Pearson's R = 0.58), but the MoCA-B had poor PPV (0.79) and NPV (0.53) for mild cognitive impairment compared to NPA. Conclusion:

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HAND has a high prevalence in a sub-Saharan HIV+ population although the use of published norms may cause overestimation. The MoCA-B is not a reliable screening tool for cognitive decline in sub-Saharan settings. Correspondence: *Joop E. Arends, MD, PhD, Associate professor infectious diseases, Department: Internal medicine section infectious diseases, Heidelberglaan 100, 3581 RX, Utrecht. j.e.arends@umcutrecht.nl*

Poster Presentations. Electropsychology/EEG/Epilepsy/Neurostimulation/HIV/Functional Imaging/Behavioural Neurology/Psychopathology/Forensic 15:45-17:45

McMillan T, Nair V, Meyerand B, Almane D, Birn R, Hwang G, Binder J, Conant L, Struck A, Mohanty R, Deyoe E, Nencka A, Kawsar F, Maganti R, Raghavan M, Prabhakaran V, Hermann B, Mathis J, Humohries C, Felton E, Rozman M, Zhao G. Characterizing cognitive alterations in temporal lobe epilepsy using machine learning

Objectives: To determine the applicability of machine learning techniques to classify patients with temporal lobe epilepsy (TLE) and healthy controls using conventional and experimental cognitive measures. Participants and methods: Participants were 37 individuals with TLE (Mage = 41.75, 22 females, Medu = 14.41) and 37 healthy controls (Mage = 38.73, 22 females, Medu = 14.95) from the Epilepsy Connectome Project, matched for age, gender and education. Fourteen cognitive measures were used including traditional tests of intelligence (WASI-II), memory (R-AVLT), dexterity (Grooved Pegboard), spatial orientation (JOLO), letter fluency (FAS), semantic fluency (Drane Fluency), and object naming (BNT). Four experimental measures from the NIH Toolbox were included: processing speed (Pattern Comparison), cognitive flexibility (Dimensional Change Card Sort), inhibition (Flanker), and working memory (List Sorting). Support Vector Machine (SVM) and Random Forest (RF) were used for the binary classification. For SVM, Spider Machine Learning Toolbox 3 was used with a linear kernel. For RF, a MATLAB script "TreeBagger" was used with 64 trees. For performance estimation, leave-one-out-cross-validation (LOOCV) was used. Within each loop, a t-test was computed for each feature between patients and controls. Only a certain number of 'top features' with the lowest p-values entered the training. Results: SVM demonstrated 79.7% accuracy using the seven top features, while RF showed 82.4% accuracy using six top features which included RAVLT, BNT, WASI FSIQ, semantic fluency, and Grooved Pegboard (dominant and non-dominant). Conclusion: Machine learning can classify TLE patients from controls on the basis of cognitive data with reasonable accuracy. Use of Random Forest with conventional cognitive measures provided the best discrimination. Correspondence: *Taylor McMillan, University of Wisconsin-Madison, UW Medical Foundation Centennial Building, Dept of Neurology, Rm 7220 1685 Highland Ave, Madison, WI 53704 United States. mcmillan@neurology.wisc.edu*

Light S, Bezdek M, Taiwo Z. Unique prefrontal correlates of empathy subtypes and the role of anhedonia revealed by fMRI

The unique neural correlates of empathic happiness and empathic concern (positive and negative vicarious emotion, respectively) was investigated using fMRI. Twenty healthy adults (Mage = 22.65, SD = 6.85, 60% female) completed an fMRI-based empathy induction paradigm consisting of empathic concern and empathic happiness eliciting video clips from the television show "Extreme Makeover: Home Edition". ROI analyses were completed using AFNI utilizing select video clips that were rated by participants as most evocative of each empathy subtype. Participants also completed the Interpersonal Reactivity Index, the Positive Empathy Scale, and the Snaith-Hamilton Pleasure Scale (to measure anhedonia). We *a priori* predicted separable neural correlates for the two empathy subtypes, along with a negative relationship between empathy and anhedonia. ROI analyses (cluster-corrected $p < 0.001$) revealed that insula activation during peak empathic happiness eliciting video clips predicted trait empathic happiness scores ($R2 = 25\%$, $p = .05$). Greater activation in the dorsolateral prefrontal cortex during peak empathic concern eliciting video clips predicted greater trait empathic concern ($R2 = 27\%$, $p < .05$). Finally, greater activation in mid-anterior orbitofrontal prefrontal cortex during peak empathic happiness video clips predicted greater hedonic capacity ($R2 = 49\%$, $p < .05$) (i.e. lesser anhedonia). These findings support our hypotheses and prior work suggesting insular cortex is involved in empathic processing. However, it adds to this literature by providing the first indication that successful expression of empathy subtypes relies on differential prefrontal cortex function. Furthermore, the results suggest that brain activation during empathic happiness specifically relates to anhedonia. Correspondence: *Sharee Light, PhD, University of Wisconsin-Madison. slight@gsu.edu*

Vicentini J, Weiler M, De Campos BM, Valler L, De Almeida SRM, Min l. Functional reorganization of the Default Mode Network in ischemic stroke: A prospective study

Introduction: Resting-state functional connectivity is defined as a temporal correlation between spatially remote regions of the brain. The Default Mode Network (DMN) is one of most prominent resting-state functional networks of the brain and it has been associated to self-referential processing. Previous studies reveal that DMN functional connectivity can be altered in neurological disorders, such as stroke. Brain reorganization is a fundamental mechanism during patient recovery after a stroke, since it involves the capacity of the brain to restore itself or compensate for damage caused by the lesion. We aimed to explore the mechanism of DMN functional connectivity recovery in ischemic stroke through a longitudinal study. Materials and methods: Twenty stroke patients aged between 45 and 80 years, who had experienced their first-ever ischemia, without previous neurological history, were submitted to functional Magnetic Resonance

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Imaging (fMRI) acquisition using a 3T scanner (Philips Achieva®) on their first and sixth month after a stroke. Image processing based on realignment, segmentation, normalization (MNI-152) and smoothing used the UF2C (User Friendly Functional Connectivity) toolbox. Paired t-test performed in SPM12 for MATLAB followed the parameters of $p < 0.001$ uncorrected and cluster size with at least 50 voxels. Results: We found an increased connectivity of DMN functional connectivity in posterior cingulate cortex (PCC) in the first month post stroke, when compared to six months after ictus. Increased DMN functional connectivity in the first month after ictus suggests failure to suppress activity in some of the core regions of DMN, which is associated with self-referential processing. However, six months after the stroke, there is a functional improvement in this network, suggesting that the first six months are a critical period for neural reorganization. Conclusion: Abnormal DMN functional connectivity was found following a stroke in the sub-acute stage. There was a natural recovery of this network six months' post stroke. Our findings are exploratory, and further research may facilitate the understanding of potential mechanisms underlying self-referential processing in stroke recovery. Correspondence: *Jessica Vicentini, PhD, University of Campinas, Rua Vital Brasil, 251, 2 andar, Ressonância Magnética - Cidade Universitária. je_vicentini@hotmail.com*

Cassimjee N, Van Coller R, Slabbert P, Vaidyanathan J. Longitudinal neuropsychological outcomes in a patient with Tourette Syndrome after deep brain stimulation of the antero-medial globus pallidus interna: A retrospective case review

Bilateral deep brain stimulation (DBS) of the antero-medial global pallidus interna (GPi) is a plausible treatment option in medication refractory Tourette Syndrome (TS). TS pathophysiology involves cortico-striato-thalamo-cortical circuitry wherein GPi is the modulating agent. DBS studies and GPi functional area distinction indicate that stimulation of antero-medial sub-territory improves obsessive compulsive disorder (OCD) symptoms in TS. This case review assesses neuropsychological outcomes of DBS in a 25-year-old male with typical co-morbidities (attention deficit disorder and OCD). Clinical history of symptomatology indicated presence of multiple complex motor and phonic tics from a young age which interfered with functional activities, disrupted social behaviour and impaired occupational competency. Neuropsychological evaluation before surgery was conducted utilizing the Repeatable Battery for the Assessment of Neuropsychological Status as the main outcome measure. Secondary associated measures included Trail Making Test, Yale Global Tic Severity Scale, Yale-Brown Obsessive-Compulsive Scale, Gilles de la Tourette Syndrome-Quality of Life (QOL) Scale, Beck Depression and Anxiety Inventory and Barratt Impulsiveness Scale. The patient was re-assessed ten months after GPi-DBS and results indicated alleviation of psychiatric features, improvement in motor and vocal tics and consistent neuropsychological functioning. Psychiatric status review showed improvement in OCD, depression and anxiety symptoms, minimal change in impulsiveness profile and significant change in self-reported QOL. Variable changes in the neuropsychological profile were observed. Overall total neurocognitive performance improved marginally. Consistently poor performance was noted in executive functioning over and above any deficits in underlying component skills. This case review demonstrates that GPi-DBS was efficacious, resulting in general improvement of functioning. Correspondence: *Nafisa Cassimjee, PhD, Department of Psychology, University of Pretoria, Postnet Suite Suite 774 Private Bag X37 Lynnwood Ridge 0040, Pretoria, South Africa. dr.hessen@gmail.com*

Gouse H, Henry M, Marcotte T, Thomas K, Josko J, Dreyer A, Robbins R. The impact of HIV-associated neurocognitive impairment on driving simulator performance in South Africa: A pilot study

Objective: The lifespan of HIV-infected individuals is extended by combination antiretroviral therapy, however HIV-associated neurocognitive impairment (NCI) remains highly prevalent. Impact of such impairment on vocational functioning is poorly understood. To explore this, we examined driving simulator performance in HIV+ drivers from Cape Town, and assessed their driving-history and habits. Methods: Thirty-five HIV+ drivers with (n = 7) and without (n = 28) NCI were administered a comprehensive neuropsychological test battery, two driving simulator tasks (Lane Tracking and Challenge Drive), and the Driving Habits and History questionnaire (DHHQ). Results: NCI individuals were older (M = 44, SD = 6.55 vs M = 38, SD = 6.88, p = .04) than unimpaired individuals. On the Challenge Drive, they tended to drive more slowly (M = 7.50, SD = 5.99 vs M = 3.36, SD = 3.91, p = .02), and to exceed the speed limit by > 10km/h more frequently (M = 4.33, SD = 6.44 vs M = .80, SD = 1.87, p = .01). There was a trend toward a between-group difference for more frequent hard braking (M = 5.14, SD =3 .93 vs M = 3.26SD = 2.33, p = .06). On DHHQ, results were equivalent except for NCI drivers reporting driving longer distances per month compared to unimpaired drivers (M = 1225.87, SD = 618.67 vs M = 703.69, SD = 714.37, p = .05). Conclusion: Older individuals may be predisposed to NCI. NCI drivers presented with increased driving risk behaviour, specifically poor speed control and harsh braking. The longer distances they reported traveling may translate into increased risk exposure. Equivalence between the NCI and unimpaired groups on self-reported driving behaviour suggests that those with NCI do not perceive any negative impact on real-world driving behaviour. Further investigation into the effects of HIV-associated NCI in South African drivers is warranted. Correspondence: *Hetta Gouse, PhD, University of Cape Town, 103 Woodhill, 15 Woodside Road, Tamboerskloof, Cape Town, South Africa. hetta.gouse@uct.ac.za*

Garcia-Anacleto A, Salvador-Cruz J. Development of inhibitory control and attention processes in healthy preschool children: An ERP study

Inhibitory Control is the skill to stop preponderant responses (Diamond, 2013). To perform this control effectively there is a certain level of maturity required in attention processes (Rothbarth, Sheese, Rueda & Posner, 2011). Go/No-Go is the

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simplest task to assess inhibitory control (Simpson & Riggs, 2006) and the Oddball task has been associated with attention processes (Polich, 2007). However, the relation between Go/No-Go and Oddball haven't been established in the same population of children. The purpose of this study was to distinguish behavioural performance and to link Event-Related Potential (ERP) in Go/No-Go and Oddball tasks in groups of children aged 4 and 5 years old. Results: Go/No-Go task shows that the 4-year-old group achieve a 48.11% and the 5-year-old group a 61% of correct performance. Meanwhile in Oddball task correct performance of 4-year-old group was 64.16%, and of 5-year-old group 84.56%. Physiological results: ERP comparisons between Go/No-Go and Oddball show main differences at 400ms. (F1-15 = 8,592, p = .01) and 500ms. (F1-15 = 5.174, p = .04), and between electrodes localization regions: FC, C, CP & P (F3-45 = 2.794, p = .05) in 5-year-old group. Comparisons between age groups present differences between electrodes localization region: FC, C, CP & P at 500ms. (F3-45 = 4.932, p = .005) and at 600ms. (F3-45 = 2.827, p = .05) in GO/NoGo tasks. Conclusion: the 5-year-old group presents a better performance in both tasks, and a clear distinction of the ERP activity associated with each paradigm. Correspondence: *Antonio Garcia-Anacleto, PhD. Judith Salvador-Cruz. division in postgraduate studies and research, Faculty of higher education (FES) Zaragoza, UNAM, México. batalla 5 de mayo s/n esquina fuerte de Loreto, col. Ejército de oriente, Iztapalapa, CDMX. npsic.garcia@gmail.com*

Dhillon S, Egeto P, Zakzanis K, Beaulieu S, Tourjman SV, Purdon SE. Cognitive change with treatment for Major Depression and functional outcomes: A meta-analytic review of the literature

Major Depressive Disorder (MDD) is the current leading cause of disability worldwide and is a primary risk factor for suicide. It is widely recognized that the psychological symptoms that characterize MDD can be disabling, resulting in functional impairment. In contrast, although cognitive impairment (CI) is also prominent in those with MDD, its relationship to psychosocial and workplace functioning has yet to be elucidated empirically. To this end, we undertook a quantitative review of the research literature and employed meta-analytic methods to examine cognitive changes that may occur over the course of treatment for MDD and its relationship to functional disability. Twenty studies were selected for the quantitative review. The analysis of all 20 studies that included pre- to post-treatment CI measurement suggested variability in effect size but gains in most domains. We found that test measures of psychomotor speed and verbal learning were most sensitive to antidepressant intervention and that depression severity and cognitive impairment have differential contributions to physical and functional disability in the illness. Based on our findings, cognitive impairment is an essential feature of the illness that has a direct relationship on functioning and should be targeted by specific psychopharmacological agents and psychotherapy.

Saturday 08 July 2017
Plenary. Rehabilitation of Memory and Executive Functions
Presenter: Jonathan Evans
09:00-10:00

Evans J. Rehabilitation of Memory and Executive Functions

Everyday life requires the ability to carry out tasks and activities with multiple steps, to maintain multiple goals or intentions over time, and to interrupt one task in order to complete another intended action. Successful task management and prospective remembering require the carefully coordinated interaction of memory and executive functions. These cognitive processes are frequently impaired after damage to the brain and are therefore a key target for neuropsychological rehabilitation. A big question for rehabilitation is whether interventions should aim to restore lost functions or to compensate for them. The evidence to date suggests that the greatest benefits come from compensatory strategies. Technology-based solutions offer significant potential in supporting prospective memory and the management of complex tasks. I will present evidence that technology-based reminding systems (pagers, smartphones, smart-watches) can improve task performance in people with brain injury and dementia, although uptake of technological solutions, while increasing, remains low. We have explored the barriers to uptake of technology and have developed an app designed to address the limitations of standard smartphone reminding systems. I will discuss the use of alerting, or 'non-contingent' reminders in combination with cognitive training programmes such as Goal Management Training, and the use of a voice-based interactive technology system used to support complex sequence learning. Given the ubiquity of mobile technology, including in low and middle-income countries, technology-supported neuropsychological interventions have huge potential to improve the lives of people with cognitive impairment. Correspondence: *Jonathan Evans, PhD, University of Glasgow. jonathamn.evans@glasgow.ac.uk*

Symposium. The Influence of Medical Insurance on Neuropsychology Practice in Three Southern African Countries
Chair: Sharon Truter
10:30-12:30

Kgolo T. Neuropsychology in Botswana: From registration to medical aid remuneration

There continues to be a steady yet progressive growth of Psychology in Botswana, both in its scholastic and clinical practice. In recent years, the insurmountable growth of Psychology as a discipline has led to the steady rise in the need by the different professions to define their specialty and the population that they serve. Defining the different professions starts right from the registration of practitioners, to the actual practice within one's specialty, as well as being able to register with the different medical aids keeping in

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mind their distinct roles and services provided. Until early in 2013, the Botswana Health Professions Council (BHPC) could only register clinical psychologists as a profession of Psychology. Subsequently, there are very limited medical aids in Botswana that psychologists can register with. More challenging still, the limited medical aids only register clinical Psychologists. With neuropsychology being an even newer profession in Botswana, neuropsychologists seemingly experience the most teething problems with registration, defining their scope of practice and registering with the different medical aids in Botswana. In reviewing the development and current status of neuropsychology in Botswana, this article serves to discuss the different challenges faced by neuropsychologists, from acknowledging the specialised services that they provide, to being able to register and claim with different medical aids. Through this revision, we endeavour to expose critical problems experienced by neuropsychologists in Botswana, especially with medical aid registration, as well as how these problems negatively affect the practice of neuropsychology. Correspondence: *Tumelo Kgolo, MA Counselling Psychology, University of Botswana, Psychology Department, Plot 15547 Broadhurst, Gaborone Botswana. 2miekay@gmail.com*

Maganlal U. To test or not to test - that is the question: A reflection of the neuropsychology dilemma in South Africa

This presentation will examine the challenges of working within the clinical neuropsychology field in South Africa, particularly the challenges regarding billing to medical insurers, where payment for neuropsychological assessments are limited to face to face time only, with no consideration given to the hours of work done pre- and post-assessment and where psychologists in the field are restricted in the appropriate use of ICD 10 codes. This paper consists of two parts. The first part looks at the role that a lack of knowledge about neuropsychology plays in the decisions made regarding remuneration for neuropsychological services by medical funders. The presenter will describe the outcomes of an initiative to educate medical insurance decision makers regarding the purpose and process of neuropsychological assessments. She will explain the nature of the educational initiative, the reactions of the receivers and the outcome of discussions that followed from this process. The second part critically examines the applicability of billing models from other countries, specifically the US, to the South African situation. This is with the view of finding a more appropriate billing model to propose to South African medical fund decision makers, once they have been made more receptive to the idea. Correspondence: *Urvashi Maganlal, Clinical Psychologist BSc (Chem), PDMM (Unisa), BA Psych (Hons), MA (Neuropsychology dist. Wits), Centre of Advanced Medicine, 13 Scott Street, Waverley, 2090. urvashi.maganlal@gmail.com*

Annandale W. Exploration of a model to improve availability of medical insurance funds for neuropsychological services in Namibia

In Namibia, there are restrictions on the extent to which local medical aid funds provide benefits for neuropsychological assessments and rehabilitation. This has an impact on both practitioners and patients. In this paper, a brief history of neuropsychology in Namibia will be provided and the most prevalent difficulties facing psychologists providing neuropsychological services, particularly in the light of limited medical aid remuneration, will be sketched. As a solution to the difficulties, the presenter will propose a model for neuropsychological services to be paid out of a separate pool of benefits, rather than the same pool of benefits for "psychotherapy". The reasoning for this proposal and the results of initial discussions with relevant decision makers in this regard will be discussed. Finally, questions regarding who can claim from the pool, which codes should be used and what cost structure should be proposed will be presented as discussion points. While this proposed model and initiative is taking place in Namibia, progress made in Namibia holds promise for other countries of the Southern African Development Community, such as South Africa, Zimbabwe, Botswana, Malawi, Lesotho, Swaziland and Mozambique, since there is a high degree of cooperation between the respective countries' health care funders. Correspondence: *Willem Annandale, MA, PO Box 9500 Windhoek Namibia. nampsych1991@gmail.com*

Paper Presentations. HIV/Epilepsy 10:30-12:30

Kabubu N, Lydersen S, Menon JA, Heaton RK, Franklin Jr D, Hestad K. Effect of age and level of education on neurocognitive impairment in HIV positive Zambian adults

Age and level of education are known to influence neurocognition in healthy adults. It is also reported that HIV infection may accelerate brain aging. Conversely, higher education may possibly protect against HIV associated neurocognitive disorders. In the current study, we sought to assess the effect of age and education in an HIV-1 clade C infected adult population in urban Zambia. Demographically corrected Zambian norms on a neuropsychological (NP) test battery were used to correct for normal age and education effects. The study assessed 286 HIV positive (+) males (37.1%) and females (62.9%) with a mean age of 41.35 (SD = 2.2) and mean years of education = 10.16, SD (8.6). A comprehensive neuropsychological (NP) Test Battery was used to assess cognitive domains frequently affected by HIV: attention/working memory, learning and delayed recall, executive function, verbal fluency, processing speed, verbal and visual episodic memory, and fine motor skills. Results suggest that only in younger HIV+ Zambians, higher education evidenced protective effects against NC impairments overall, and specific domains of executive functions, learning and speed of information processing. Impairment scores did not support accelerated overall brain aging although the restricted age range and relative youth of

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our total sample may have precluded detection of such tendencies. This implies that there is a need to closely monitor the younger less educated HIV+ population in Zambia in order to help mitigate the observed negative cognitive effects. Correspondence: *Norma Kabuba*, *PhD student, University of Zambia Psychology Department, Box 32379 Lusaka, Great East Road campus. zewelanjik@gmail.com*

Robbins R, Joska J, Gouse H, Brown H, Ehlers A, Scott T. Sensitivity and specificity of a tablet app to detect neurocognitive impairment among HIV+, isiXhosa-speaking South African adults

Background: Despite remaining prevalent, HIV-associated neurocognitive impairment (NCI) is rarely screened for, especially in resource-limited settings (RLS), such as South Africa, where there is a dearth of locally normed tests and expertise to administer them. NeuroScreen is an Android tablet app developed to screen for NCI in RLS. It consists of eight tests measuring learning, memory, processing speed, attention, motor speed, and executive functions. This study examined the sensitivity and specificity of NeuroScreen to detect NCI among HIV+ isiXhosa-speaking South Africans when administered by lay health workers. Methods: NeuroScreen was administered to one hundred and two HIV+ adults who then completed a comprehensive neuropsychological (NP) battery. Locally normed, unadjusted T-scores were computed for all NP tests and used to calculate a global deficit score (GDS) to determine NCI status. A Receiver Operating Characteristic (ROC) curve was computed with the NeuroScreen total score and GDS cut-score of ≥ 0.5. Results: Participants were 33 years old (SD = 7.5), 83% female, and 20% graduated high school. Using the GDS cut-score, 27% had NCI. The area under the curve for NeuroScreen was 73%. The NeuroScreen total score of ≤ 392.25 maximized sensitivity (82%) and specificity (65%). This yielded a positive predictive value of 46%, and negative predictive value of 91%. Conclusions: NeuroScreen has useful test characteristics when administered by lay health workers, although it may overestimate NCI compared to a full FNP battery. Because of limited locally available normative data, these test characteristics and discrepancies between NeuroScreen and the NP battery should be examined further with demographically adjusted norms. Correspondence: *Robbins Reuben, PhD, Columbia University and New York State Psychiatric Institute, 1051 Rivderside Drive Unit 15, New York. rnr2110@cumc.columbia.edu*

Lee G, Park Y. Is epilepsy a progressive disease? Evidence from neuroradiological and neuropsychological studies

Investigations into the pattern of change in brain and cognition among patients with refractory epilepsy over time have yielded contradictory results. A particularly difficult question to answer has been whether or not uncontrolled epilepsy should be considered a progressive neurological disease. Neuroradiological Studies: Both cross-sectional and longitudinal neuroradiological studies, including volumetric MRI, voxel-based morphometry (VBM), and cortical thickness analyses, have provided consistent data demonstrating progressive structural brain damage in patients with refractory temporal lobe epilepsy (TLE). These MRI-based sensitive and reproducible methods have shown atrophy and gliotic changes in the hippocampus and neocortex of patients with TLE. These methods suggest epilepsy is a progressive disease and have found associations of seizure duration and frequency with neuronal damage. Neuropsychological Studies: Recent cross-sectional neuropsychological studies have suggested many of the cognitive deficits seen in patients with refractory epilepsy are established by late childhood or early adulthood, and then show normal age-related patterns of decline throughout the rest of adulthood and late life, suggesting epilepsy is not a progressive disease (Baxendale *et al*., 2010; Helmstaedter & Elger, 2009). Although there are fewer (N ~ 30) longitudinal cognitive studies, and most have significant methodological limitations (e.g., no control group), they suggest there is evidence of progressive cognitive decline over time (Dodrill, 2004; Seidenberg *et al*., 2007). Correspondence: *Gregory Lee, PhD, Medical College of Georgia, 2907 Bransford Road Augusta, GA 30909 USA. glee@augusta.edu*

Banks S, Jones-Gotman M. Aging without a hippocampus: Very long-term outcome from temporal lobe surgery for intractable seizures

Over the past few decades, surgery has become an option in the successful treatment of medically intractable seizures. To date there have been few long-term follow-up studies, so it is unclear if such surgery is associated with progressive decline in cognition as age becomes a factor. Given that the Montreal Neurological Institute was a major location for the development of this surgical technique and associated neuropsychological evaluations, we were able to recruit patients from this cohort 30-plus years after their surgery. Nineteen patients were recruited. Eight had undergone left hemisphere surgeries (LTLE), and 11 had undergone right hemisphere surgeries (RTLE). They had a mean age of 63 years. We also recruited age- and education-matched controls. We administered similar tests to those that had pre- and post-surgically, as well as more contemporary measures. The patients also underwent MRI scans including DTI, and genetic testing for ApoE status. Compared with controls, patients demonstrated modality specific memory impairment, with LTLE patients showing reduced naming, verbal reasoning and verbal memory. RTLE patients demonstrated reduction in design fluency and nonverbal memory. In comparison with their own post-operative assessments, LTLE patients showed some decline on Block Design, but no change on memory or other scores. RTLE patients showed decline in nonverbal memory and on arithmetic, but not on verbal memory or other tests. We demonstrated relatively isolated cognitive impairments in these patients, with some declines with time. We will further evaluate their neuroimaging and genetics to determine whether or not the extent of surgery, integrity of the unoperated hemisphere, current seizure status or genetics may help explain variations in long term outcome. Correspondence: *Sarah Banks*, *PhD, Cleveland Clinic Lou Ruvo Center for Brain Health, 888 w bonneville avenue, Los Vagas. bankss2@ccf.org*

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Harris M. Neuropsychological Assessment Battery (NAB) memory outcomes after temporal resection in epilepsy

Objective: Previous epilepsy research has found verbal memory decline with language dominant (LD) temporal resection, but less decline with non-language dominant (NLD) resection. This study examined memory outcomes from temporal lobe resection and explored predictors of memory change. Participants and methods: Pre- and post-surgical scores on the Neuropsychological Assessment Battery (NAB) Memory Module were compared for 13 anterior temporal lobe resection patients (M(SD)age = 34.9 (6.2) years; M(SD)education = 13.2 (3.6) years). Relationships between epilepsy-related variables and NAB scores were investigated. Results: Five patients showed verbal memory decline of at least one standard deviation (4 LD resection) while two showed visual memory decline (1 LD) and five showed memory improvements. LD resection patients declined more than NLD resection patients in a delayed list recall task ($F1,11 = 6.327$, $p = .016$). PET imaging findings contributed significantly to prediction ($F1,9 = 4.021$, $p = .041$), with decreased uptake on resection side predicting less decline in list memory. Patients with prior memory impairment demonstrated less memory change. Higher contralateral injection Wada memory scores were significantly correlated with decline in delayed list recall ($r = -.523$, $p = .047$). Conclusions: The current results using updated memory tests supported previous research, suggesting an increased risk of verbal memory decline with surgery in the LD temporal lobe, higher contralateral Wada memory performance, and high pre-surgical memory scores. PET imaging findings contributed significantly to memory change prediction. Examination of pre-surgical memory using Wada and pre-surgical neuropsychological testing, as well as examination of imaging data may aid in prediction of memory change. Correspondence: *Matthew Harris, PhD, University of North Carolina, 5910 Lyon Farm Drive Durham, NC 27713 United States of America. matthew_harris@med.unc.edu*

Hessen E. Risk factors for parent-reported executive problems in children and youth with epilepsy

Objectives: Executive problems in children and youth with epilepsy influence their ability to handle important aspects of daily life activities. The present study sought to explore risk factors for executive problems for patients with epilepsy in this age group. Methods: The cohort consisted of one hundred and one consecutive patients aged 10-19 years with focal or genetic generalized epilepsy. All underwent a neuropsychological assessment, including parent completion of the Behaviour Rating Inventory for Executive Function (BRIEF) as well as screening for psychiatric symptoms, using the Strengths and Difficulties Questionnaire (SDQ) for both patients and parents. Results: Multivariate logistic regression analysis showed that poor score on a composite measure of executive tests (T score < 35), as well as high score on parent screening for psychiatric symptoms were independent significant risk factors for poor score (T score > 65) on the Metacognitive Index on BRIEF. Similar analysis showed that high score on parent screening for psychiatric symptoms was an independent significant risk factor for poor score (T score > 65) on the Behavioural Rating Index on BRIEF. Other epilepsy-related or psychosocial factors were not significantly associated with reported executive problems. Conclusions: Multiple factors are associated with executive problems in children and youth with epilepsy. In this study, tested executive dysfunction and high level of psychiatric symptoms were independent risk factors for reported problems with cognitive aspects of executive functions while high level of psychiatric symptoms was an independent risk factor for reported problems with behavioural aspects of executive functions. Correspondence: *Erik Hessen, PhD, University of Oslo, Krags vei 13, 0783 Oslo, Norway. dr.hessen@gmail.com*

Symposium. Reflections on Ecologically Valid Measurement Techniques for Assessing Planning, Multi-Tasking and Organisation in Patients with Dysexecutive Impairment
Chair: Robin Morris
10:30-12:30

Morris R, Tierney K, German E, Silber E. Individual task processing not multi-tasking is the likely cause of ecological task difficulty in people with multiple-sclerosis

Background: Multiple Sclerosis (MS) is a multi-faceted condition, also associated with neuropsychological dysfunction and this includes everyday difficulties in executive functioning. The study aimed to investigate cognitive abilities in relapsing remitting MS (RRMS) using a novel modification of the Hotel Task. In particular, performance of participants with RRMS was compared on high and low executive demand conditions of this task. Method: Nineteen participants with RRMS and 19 matched healthy controls completed standard and structured conditions of the Hotel Task, with comparisons made with standard neuropsychological tasks and questionnaires measuring non-cognitive symptoms and everyday cognitive functioning. Results: Participants with RRMS displayed significantly less efficient performance on both conditions of the Hotel Task compared to controls, and performance did not differ significantly between conditions, the exception being impairment in prospective memory. Conclusions: The study shows that RRMS is not associated with disproportionate impairment in multitasking, although specific impairments in prospective memory may be present. Correspondence: *Robin Morris, MA, Msc, PhD, King's College Institute of Psychiatry, Psychology and Neuroscience, PO Box 078, Psychology Institute of Psychiatry, Psychology and Neuroscience De Crespigny Park. Robin.Morris@kcl.ac.uk*

Morris R, Jansari A, Denmark T, Tailor J, Ashkan K. The frontal paradox demonstrated in patients with focal neurosurgical prefrontal lesions using a virtual reality measurement of multi-tasking

Introduction: The "frontal paradox", often observed in patients with prefrontal lesions, in which there is normal performance on tests of executive functioning (EF) despite behavioural disorganisation in everyday life, could be driven

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by lack of ecological-validity of current assessments. The Jansari assessment of Executive Functions (JEF©, Jansari *et al*., 2014) is a new tool addressing this lack using virtual-reality (VR). This multi-tasking procedure, which simulates clerical office work, was used to explore the performance of individuals with neurosurgical prefrontal lobe lesions (PLL) and compared to performance on traditional "paper and pencil" EF tests. Method: Nineteen individuals with PLL were compared with 19 healthy matched controls on JEF© versus non-VR measures of neuropsychological functioning, including tests and questionnaires concerning EF. Results: The results showed that the two groups differed only on two of the eight non-Virtual Reality EF measures. However, there were significant differences between the groups on JEF© total score $F(2.37) = 17.21$, $p < .001$, $\eta p2 = 3.2$ and on five of its eight individual measures relating to planning, adaptive thinking, creative thinking and both event and time-based prospective memory (all ps < 0.05). Within the PLL group, impairments were not related to lesion location and laterality. Conclusions: The current results suggest that lack of ecological validity of existing measures drives the frontal paradox. The findings support the use of laboratory-based VR such as JEF© in detecting impairments in EF in individuals with prefrontal lobe lesions and also potentially for simulating everyday impairment when developing new rehabilitation approaches. Correspondence: *Robin Morris, MA, Msc, PhD, King's College Institute of Psychiatry, Psychology and Neuroscience, PO Box 078, Psychology Institute of Psychiatry, Psychology and Neuroscience, De Crespigny Park. Robin.Morris@kcl.ac.uk*

Fish J, Manly T. Assessing multitasking in brain injury and normal ageing using the Hotel Test: A valid test in ten minutes?

Introduction: The Hotel Test is a desktop measure of multitasking in which participants are asked to imagine they are on a work trial at a hotel, and that their aim is to complete as much as they can from five tasks associated with running this hotel within a set time limit. Various versions of the test have been used in a range of clinical groups, and the pattern of results from such studies gives the initial indication that it is a sensitive and responsive measure. However, standardisation data have until now been lacking. Methods: Here, we present data from a group of neurologically healthy adults across the lifespan on a new 10-minute version of the Hotel Test, using data from a large-scale study of cognition and ageing. Results: The results will encompass the changes in multitasking ability that occur with age, and the relationship between multitasking performance and performance on tests of other cognitive domains. Data from two smaller clinical studies will also be presented, which demonstrate that this version of the test is sensitive to acquired brain injury, and that performance on it has a significant association with the rate at which participants with acquired brain injury attain their day-to-day goals. Conclusions: There is hence good evidence of its validity. In addition, as the test uses inexpensive materials and its protocol can be freely accessed, it has considerable potential clinical utility. Correspondence*: Jessica Fish*, *PhD, United Kingdom. Jessica.Fish@kcl.ac.uk*

Discussant

Presenter: Jonathan Evans
10:30-12:30

CE Workshop. The art, craft and science of diagnostic reasoning in clinical neuropsychology: From symptomatology to objective markers
Presenter: Coco Bernard
10:30-12:30

This workshop has been designed to build an awareness of diagnostic consultation in clinical neuropsychology as an integrated and principled mode of thought aimed at understanding the underlying causation of each patient's presenting problem. We will trace the process from the concerns and predicaments that bring the patient to clinical attention, to diagnostic formulation, unfolding the internal logic that characterises each step along the way. Unlike most other fields of clinical endeavour, our field has had a rather uneasy relationship with some of the key ideas that inform clinical reasoning; these include subjective experiences of a dysfunction (symptoms), the difference between the assessment of high level abilities and the use of markers to define disorders at a neurocognitive systems level, and the nature of diagnosis as opposed to prediction. This is understandable in terms of the controversies that have wound their way through the history of psychology in general, but it does limit the heights we can as diagnosticians, and need to achieve as neuropsychologists of the future. One aim of this workshop is to promote an understanding of how subjective concerns and objective findings interact in the course of problem-oriented diagnostic reasoning. A further aim is to consider the interaction between neurocognitive and neuroimaging markers in the differential diagnosis of conditions presenting as recent-onset memory concerns. It will be argued, contrary to the often-expressed opinion, that advent of increasingly sophisticated neuroimaging markers does not spell the impending obsolescence of neuropsychological expertise. Rather, it emphasizes the complexity of the relationship between brain disease, its symptomatic expression, and its functional implications. The workshop will be illustrated with case material. Teaching objectives:

•To provide an introduction to problem-oriented diagnostic reasoning, emphasizing the integration of clinical observation, subjective symptomatology, objective investigation, and the incorporation of neuroimaging markers

•To introduce attendees to the evaluation of subjective expressions of memory disorders, its role in generating diagnostically significant information, and its growing importance in the very early detection and differential diagnosis of dementias

•To build an understanding of neurocognitive markers as opposed to assessment of abilities, and to consider their respective applications and validation requirements

•To build a more nuanced view of neuropsychological

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diagnosis vis-à-vis "one size fits all" approaches. Correspondence: *Salling M, AM PhD MAPS. The University of Melbourne, Austin Health & Florey Institute of Neuroscience & Mental Health, Australia. coco.bernard@monash.edu*

Poster Presentations. Executive Functions/Frontal Lobes/Language and Speech/Memory 10:30-12:30

Herdman K, Ozubko J, Moscovitch M, Rosenbaum RS. Using Google Street View to investigate navigation of frequently travelled environments in developmental amnesia

The hippocampus has long been implicated in forming spatial representations of new environments. Developmental amnesic HC was previously tested on static paper-and-pencil mental navigation tasks to examine whether representations of environments navigated repeatedly over many years could be formed, despite congenital hippocampal system pathology and impaired episodic memory (Rosenbaum *et al*., 2015). HC showed intact coarse, schematic representations that lacked coherence and detail, and could not be used flexibly. This suggested that spatial representations of large-scale, real-world environments can be learned over time, even in the context of a hippocampal system that developed atypically. The current study aimed to substantiate these findings using a novel, dynamic Google Street View paradigm that improves ecological validity by allowing first-person, street-level navigation of real-world environments, while circumventing the restrictions of mobility, fatigue, and changing cues within the environment. HC and age-matched controls were asked to navigate highly familiar routes that they frequently travel, infrequently travelled routes, GPS follow-the-arrow control routes, and "mirrored" routes, which reverse east and west directions and require the reconfiguration of highly familiar routes. Preliminary results show that HC did not differ from controls across route conditions on parameters of navigational efficiency, such as number of pauses or turns, speed of navigation, and distance to target location, even on routes requiring the remapping of familiar routes. This is surprising given that HC's performance on static mental navigation tasks suggested rigid representations of environments. It may be that Google Street View provides necessary visual cues that aid in more flexible navigation. Correspondence: *Katherine Herdman, Clinical Psychology Doctoral Candidate, York University, M3J 1P3, Toronto, Canada. kherdman@yorku.ca*

Oviedo-Rodríguez E, Ramírez-Bermúdez J, Díaz-Victoria AR. Decision making and its relation to executive functioning in patients with Bipolar Disorder and Major Depressive Disorder

Decision making is a complex process that involves interaction of cognitive and emotional operations performed on various neural structures (Richard-Devantoy *et al.,* 2015). Objective: To evaluate the decision-making relationship in the "Card Game" (CG) sub-test with executive functioning in patients with Bipolar Manic Episode Disorder (BMED) and Major Depressive Disorder (MDD). Procedure: 30 hospitalized and diagnosed patients at the National Institute of Neurology and Neurosurgery with BMED (15 patients), MDD (15 patients) and 15 healthy controls (C) were evaluated. We used the Neuropsychological Battery of Executive Functions and Frontal Lobes, and the serious alterations in cognitive performance were ruled out with Cognistat. Results: With a significance of $p < 0.05$, there were differences in the net yield of CG between C and MDD ($p = 0.033$) and between C and BMED ($p = 0.022$). In BMED, a moderate positive correlation was found between CG score and semantic classification ($r = .521$); in MDD, a moderate positive correlation was found between mental subtract score and net score in CG ($r = 0.525$). Conclusions: The results suggest that performance in decision making when the risks may be known, as in the case of the MDD group, is related to working memory skills. The performance of the group with BMED is related to the abilities in the organization of the information. Impulsivity was not a determinant in the CG for any group. Correspondence: *Oviedo Rodrigu ez Eben Ezer, PhD, UNAM, INNN Avenida Benito Juárez #96, Colonia Barrio Norte CP 01410 Delegación Álvaro Obregón, Mexico. neuro_emotions@hotmail.com*

Massicotte E, Jackson P. Relationship between executive functions and food craving and their impact on junk food intake in obesity context

Recent neuroimaging data point toward an imbalance between cognitive control and reward systems in response to food cues in obese populations. At the behavioural level, executive functions (EF) are reduced in this population, but little is known regarding food craving (FC; related to the reward system) and its link with EF. The aim of this study was to characterize the link between EF and FC and their relationship with junk food intake (JFI) and obesity. Forty-eight participants (34 females) with BMIs ranging from 18.5 to 46.4 took part in two experimental sessions (at 11:00am and 12:30pm respectively on consecutive days) and were instructed to refrain from eating three hours before. Firstly, EF were assessed using the Delayed Discounting Task (impulsivity toward food and money) and the Stroop (inhibition, flexibility). Secondly, a cue-provoked FC protocol was administered followed by a food intake protocol (junk and healthy food). FC and flexibility were negatively correlated ($r = -0,29$; $p < 0.05$). FC and impulsivity toward food and money were positively related to obesity indices ($p < 0.05$). Using a multiple linear regression, a significant contribution of FC ($\beta = 0.45$; $p < 0.01$) and impulsivity ($\beta = -0.26$; $p < 0.05$) to the variance of JFI were found. Interestingly, this study showed that FC is associated with lower flexibility. Future investigations on the causality of this association would clarify its clinical implications. The results also suggest a role of impulsivity and FC in obesity. Finally, FC could be an interesting target for interventions aiming at reducing JFI. Correspondence*: Philip Jackson, PhD, École de psychologie, Université Laval (Research centres: Cirris,*

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Kessels R, Murk S, Walvoort S, Hampstead B. Mnemonic strategy training in Korsakoff's amnesia: A controlled pilot study

Objective: Korsakoff's syndrome (KS) is characterized by profound anterograde and retrograde amnesia for contextual, episodic information. So far, only a few studies have examined memory training in this patient group, with mixed results. This controlled study examined an associative mnemonic strategy training in KS with the aim to improve memory function. Methods: Fourteen KS patients were randomized to a mnemonic strategy training plus treatment as usual (TAU; N = 7) or TAU only (music/occupational therapy; N = 7). A baseline cued-recall assessment of object-location memory (OLM) was performed on day 1, followed by three 30-min mnemonic strategy training sessions for the mnemonic group over the subsequent days (2-4). On day 5, a post-intervention OLM assessment was performed in both groups, as well as a 1-week follow-up OLM assessment. All assessments used untrained object-location associations (near transfer). Results: Repeated-measures GLM did neither reveal overall changes over time ($p = .218$), nor a significant interaction between time and group ($p = .77$). A marginally significant group effect was found ($p = .073$), but adjustment for baseline performance did not alter the results. Discussion: Although previous research in aMCI patients have shown beneficial effects of mnemonic strategy training, these findings could not be extended to KS. This may be related to the small sample size, despite a within-subject design, the OLM paradigm as outcome measure, which may have been insensitive to subtle improvements, or the profound context-memory deficits in KS, possibly limiting the effects of strategy training in those with severe memory impairment. Correspondence: *Roy Kessels, PhD, Radboud University DCC – Neuropsychology Montessorilaan 3, 6525 HR Nijmegen.* r.kessels@donders.ru.nl

Raskin S, Race M. Development of a short form of the Memory for Intentions Test

The Memory for Intentions Screening Test (MIST) is a standardized measure of prospective memory (PM) (Raskin, 2009). However, the MIST can be difficult to incorporate in a full battery as it takes approximately 30 minutes. The aim of this study was to create a short form. Selected items from the original MIST were included, and standard self-report questionnaires were used as the ongoing task. Administration time is 18 minutes. To determine psychometric properties, 44 healthy adults ranging from age 18 to70 were included. To investigate the sensitivity of the task 20 individuals with acquired brain injury matched in age and years of education to the healthy group were included. Participants with significant depression, anxiety, global cognitive impairment or history of other neurological disorder were excluded. Questionnaires used were the Brain Injury Screening Questionnaire, and the Comprehensive Assessment of Prospective Memory. All subjects were also administered the two PM items from the Rivermead Behavioural Memory Test, the Stroop Colour-Word Interference Test, the Brief Test of Attention and the Hopkins Verbal Learning Test (HVLT). The correlation between scores from two independent raters was high ICC = .90, $p < .001$, indicating good inter-rater reliability. There was a significant correlation between MIST-S total score and the Rivermead items ($p < .01$) but not CAPM. MIST-SF total score was also significantly correnlated with total score on the Stroop ($p < .01$). MIST-SF time-based cue score correlated significantly with the HVLT ($p < .01$). Those with brain injury performed significantly more poorly on the 2-minute cue ($p < .05$), the event-based cue ($p < .05$) and the 24-hour measure ($p < .05$) than the healthy group. When the healthy adult group was separated between emerging adults (18-25 years) and adults (over 25 years), there were significant differences on MIST-SF 15-minute cue ($p < .01$), event-based cue ($p < .01$), action ($p < .001$), and 24 hours ($p < .001$). There were no effects of age on the CAPM. Education was correlated significantly with MIST-S total score ($p < .01$). Overall these data suggest that the MIST-SF is a valid and reliable measure. Correspondence: *Sarah Raskin, PhD, Trinity College, 300 Summit Street, Hartford, United States. sarah.raskin@trincoll.edu*

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