Do informal caregivers of people with dementia mirror the cognitive deficits of their demented patients?

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Wednesday 6th July 2016
Parallel Session A - 09.00 - 12.45

Oral Presentation Session: Medical conditions **09.00 - 10.30**	**Oral Presentation Session: Assessment** **09.00 - 10.30**
City Suite	**Plaza Suite A**
Ownership and self-attribution in illusory movements: the role of parietal structures Davide Crivelli **09.00 - 09.15**	**Development and validation of the children's cognitive screening instrument** Lois Coy **09.00 - 09.15**
The Veterans Aging Cohort Study (VACS) Index predicts neurocognitive impairment in people with HIV: Results from the Ontario HIV Treatment Network (OHTN) cohort study Sean Rourke **09.15 - 09.30**	**Performance validity test performance and post-concussive symptom severity following uncomplicated mild traumatic brain injury in children and adolescents** Lisa Stanford **09.15 - 09.30**
Postoperative cognitive decline in elderly oncological patients: incidence and risk factors. E. Rotteveel **09.30 - 09.45**	**Evaluating drawing strategy of the Rey Osterrieth Complex Figure (ROCF) and its unique contribution to assessing visual memory performance** Sarai Boelema **09.30 - 09.45**
The Veterans Aging Cohort Study (VACS) index and neurocognitive change: A longitudinal study Maria Marquine **09.45 - 10.00**	**Equal versus separate distributions of MMPI-2-RF validity scales relative to number of failed performance validity measures** Robert Stegman **09.45 - 10.00**
Patterns of early neuropsychological and academic achievement in neurotypicals and young children with Williams syndrome Jessica Reeve **10.00 - 10.15**	**Response bias is prevalent in neuropsychological assessment: A study of social security disability claimants in the Netherlands** Jos De Jonghe **10.00 - 10.15**
Attentional-intentional deficits associated with end stage renal disease and dialysis are normalized with kidney transplantation Michal Harciarek **10.15 - 10.30**	**Impaired communication between the motor and somatosensory homunculus is associated with poor manual dexterity in autism spectrum disorder** Abigail Thompson **10.15 - 10.30**
Symposium Session **11.00 - 12.00**	**Symposium Session** **11.00 - 12.00**
Neurorehabilitation in multiple sclerosis Convenor: Nadina Lincoln Discussant: Anita Rose Speakers: Roshan Nair, Shona Logan-King, Sinead Hynes **11.00 - 12.00**	**Practice and research insights from a culturally diverse developing country with wider cross-cultural relevance** Convenor: Ann Shuttleworth-Edwards Discussant: Ann Watts Speakers: Ann Watts, Ann Shuttleworth-Edwards, Sharon Truter **11.00 - 12.00**

Wednesday 6th July 2016
Parallel Session B - 13.00 - 14.30

Invited DoN Symposium Session 13.00 - 14.30	Symposium Session 13.00 - 14.30	Symposium Session 13.00 - 14.30	Oral Presentation Session: Speech and Language 13.00 - 14.30
Ballroom A	**Ballroom B**	**City Suite**	**Plaza Suite**
Executive functions - theory, Assessment and Rehabilitation Convenor: Jonathan Evans Speakers: Iroise Dumontheil, Tom Manly, Paul Burgess, Brian O'Neill **13.00 - 14.30**	**Numerical skills - assessment and intervention** Convenor: Margarete Delazer Discussant: Brian Butterworth Speakers: Marie-Theres Pertl, Marinella Cappelletti, Girgio Arcara, Silvia Benavides-Varela **13.00 - 14.30**	**Symptom validity: the blurred lines between crooks and genuine patients** Convenor and Discussant: Rudolf Ponds Speakers: Jos de Jonghe, Jeroen Roor, Isabella Niesten, Brechje Dandachi-FitzGerald, Harald Merckelback **13.00 - 14.30**	**Types of developmental dyslexia and their distribution in Hebrew** Naama Friedmann **13.00 - 13.15** **New word acquisition with a phonological loop deficit - A fast mapping Approach** Damien Appleton **13.15 - 13.30** **What was that again? Short-term retention in children with LI** Marja Laasonen **13.30 - 13.45** **Neuroanatomy of semantic and phonemic verbal fluency** Stephanie Forkel **13.45 - 14.00** **Effects of standard versus speeded priming on lexical access in picture naming and connected speech in older adults** Christina Sotiropoulou **14.00 - 14.15** **Discussion** **14.15 - 14.30**

Wednesday 6th July 2016
Parallel Session C - 15.00 - 16.30

Invited BNS Symposium Session 15.00 - 16.30	Symposium Session 15.00 - 16.30	Symposium Session 15.00 - 16.30	Oral Presentation Session: Executive function/TBI 15.00 - 16.30
Ballroom A	**Ballroom B**	**City Suite**	**Plaza Suite**
Memory and dementia: Cognitive neuroscience and clinical practice Chair: Julie S Snowden Speakers: Chris Bird, Michaela Dewar, Sebastian Crutch, Paul Hoffman **15.00 - 16.30**	**New insights into social cognition disorders** Convenor: Skye McDonald Speakers: Skye McDonald, Fiona Kumfor, Katherine Osborne-Crowley, Jacqueline Rushby, Michelle Kelly **15.00 - 16.30**	**Symposium: Understanding Gulf War illness: Brain-immune biomarkers, cognitive functioning and treatment development strategies 25 Years after the War** Convenor: Kimberly Sullivan Discussant: Roberta White Speakers: Kimberly Sullivan, Mohamed Abou Donia, Maxine Krengel, William Meggs, Julia Golier **15.00 - 16.30**	**Are executive function deficits a transdiagnostic risk factor for psychopathology?** Zvi Shapiro **15.00 - 15.15**
			The interactions between the amygdala and the ventromedial prefrontal cortex in their contributions towards emotional reactivity David Andrewes **15.15 - 15.30**
			Social cognition impairments after aneurysmal subarachnoid hemorrhage Anne Buunk **15.30 - 15.45**
			The impact of impact! Investigating executive problems related to Chronic Traumatic Encephalopathy (CTE) caused by contact sports Ashok Jansari **15.45 - 16.00**
			Evolution of health-related quality of life associated with post-traumatic stress and person characteristics of patients and their relatives 12 months after severe traumatic brain injury Chiara Haller **16.00 - 16.15**
			Ecological cognitive Rehabilitation based on interactive video and eye-tracking technologies. Rocio Sanchez-Carrion **16.15 - 16.30**
Keynote Presentation: Eleanor Maguire, What's possible and impossible following hippocampal damage in humans? **17.00 - 18.00**			
Award Recipient: Aikaterini (Katerina) Fotopoulou, Disorders of the Self Following Right Hemisphere Stroke: From the Bedside to the Lab **18.00 - 18.30**			

Thursday 7th July 2016
Parallel Session D - 08.30 - 10.00

Invited Symposium Session 08.30 - 10.00	Symposium Session 08.30 - 10.00	Symposium Session 08.30 - 10.00	Symposium Session 08.30 - 09.30
Ballroom A	**Ballroom B**	**City Suite**	**Plaza Suite**
Avoiding the silver tsunami: Strategies to optimize brain aging Convenor and Discussant: Joel Kramer Speakers: Rose Ann Kenny, Karen Ritchie, Linda Clare **08.30 - 10.00**	**The modality that neuropsychology neglected: Interoception** Convenor: Paul Jenkinson Discussant: Aikaterini (Katerina) Fotopoulou Speakers: Aikaterini (Katerina) Fotopoulou, Agustín Ibañez, Sarah Garfinkel, Hyeong-Dong Park **08.30 - 10.00**	**Are modern clinical neuropsychological assessment procedures really "modern?"** Co-Convenors: Bernice Marcopulos and Emilia Lojek Discussant: Ben Schmand Speakers: Diane Howieson, William Barr, Roy Kessels, Laura Germine **08.30 - 10.00**	**Understanding and treating the chronic and progressive consequences of moderate-severe traumatic brain injury** Convenor: Robin Green Discussant: Huw Williams Speakers: Robin Green, Jennifer Tomaszczyk, Brenda Colella **08.30 - 09.30**
			Special Guest Presentation **09.30 - 10.15**
			Special Guest Presentation: Single case studies - A video presentation Elizabeth Warrington **09.30 - 10.15**
Keynote Presentation: Edward De Haan, The Neuropsychology of Vision **10.30 - 11.30**			
Keynote Presentation: Angela Sirigu, Oxytocin and serotonin mechanisms in the healthy and the autistic brain **11.30 - 12.30**			

Thursday 7th July 2016
Parallel Session E - 14.00 - 15.30

Invited FESN Symposium Session 14.00 - 15.30	Student Symposium Session 14.00 - 15.30	Symposium Session 14.00 - 15.30	Oral Presentation Session; Memory 14.00 - 15.30
Ballroom A	**Ballroom B**	**City Suite**	**Plaza Suite**
Neuropsychology research in stroke: from fundamentals to novel applications in assessment and rehabilitation Convenor: Nele Demeyere Speakers: Nele Demeyere, Dario Cazzoli, Céline Gillebert, Martine van Zandvoort, Cathy Price **14.00 - 15.30**	**Aspects of anosognosia and the self** Convenor: Coco Bernard Discussant: Daniel Mograbi Speakers: Daniel Mograbi, Valentino Moro, Robin Morris, Stephanie Cosentino **14.00 - 15.30**	**Cross-cultural neuropsychology: A South Asian perspective** Convenor: Narinder Kapur Discussant: Barbara Wilson Speakers: Narinder Kapur, Ratnavalli Ellajosyula, Farzana Mulla, Aparna Dutt, Suvarna Alladi **14.00 - 15.30**	**Interference and decay in spatial memory in Korsakov patients** Albert Postma **14.00 - 14.15**
			Call me later: Using a naturalistic prospective memory task to measure everyday behaviour Jessica Fish **14.15 - 14.30**
			Material specific MTL and extra-MTL responses supporting recognition memory: Interactions between stimulus content and memory kind Alex Kafkas **14.30 - 14.45**

			Episodic memory and parietal cortex: Relationship between egocentric visual spatial representation and quality of recall Charlotte Russell **14.45 - 15.00**
			Errorless skill acquisition in Korsakoff's syndrome Erik Oudman **15.00 - 15.15**
			Specific alterations of thalamic nuclei in alcoholics with and without Korsakoff's syndrome: a Diffusion Tensor Imaging (DTI) investigation Anne-Lise Pitel **15.15 - 15.30**
Keynote Presentation: Birch Lecture - Giacomo Rizzolatti, From mirror neurons to the mirror brain **16.00 - 17.00**			

Friday 8th July 2016
Parallel Session F - 08.30 - 10.00

Invited Symposium Session **08.30 - 10.00**	**Symposium Session** **08.30 - 10.00**	**Oral Presentation Session: Dementia and Neurodegeneration** **08.30 - 10.00**	**Oral Presentation Session: Child Neuropsychology** **08.30 - 10.00**
Ballroom A	**Ballroom B**	**City Suite**	**Plaza Suite**
Treating fatigue and sleep disturbance following brain injury with cognitive behavioural therapy Convenor and Discussant: Jennie Ponsford Speakers: Jennie Ponsford, Sylvia Nguyen, Dana Wong, Adam McKay **08.30 - 10.00**	**INS International Liaison Committee Symposium: Cross-cultural adaptation of neuropsychological tests - issues, challenges and solutions.** Convenor: Jonathan Evans Discussant: Lisa Drozdick Speakers: Alberto Fernández, Aparna Dutt, Parisuth Sumransub, Srinivasan Jayaraman, Natalia Ojeda **08.30 - 10.00**	**A longitudinal study of dual task abilities in preclinical familial Alzheimer's disease** Sarah Macpherson **08.30 - 08.45**	**Working memory, short-term memory, attentional control and mathematics performance in moderate to late preterm children - implications for intervention** Emma Matthews **08.30 - 08.45**
		Clinical versus statistical prediction: the case of Parkinson's disease dementia Ben Schmand **08.45 - 09.00**	**Cognitive phenotypes in idiopathic childhood epilepsy** Bruce Hermann **08.45 - 09.00**
		The functional impact of computer versus compensatory training in mild Cognitive impairment Melanie Chandler **09.00 - 09.15**	**Ecological assessment of executive functions in preschool children with sickle cell disease** Michelle Downes **09.00 - 09.15**
		Mild cognitive impairment (MCI) after bilateral pallidal deep brain stimulation for Parkinson's disease under general anaesthesia Alexander Tröster **09.15 - 09.30**	**Predictors of post-concussive symptoms in young children: Influence of injury versus non-injury factors** Coco Bernard **09.15 - 09.30**
		Cognitive complaints in healthy individuals: association with clinical, cognitive and neuroimaging measures Patricia Díaz Galván **09.30 - 09.45**	**Acute and post-acute standardized assessments predict post-concussive symptoms after paediatric mild traumatic brain injury** Keith Yeates **09.30 - 09.45**

		Transcranial direct current stimulation enhances sustained attention in ageing - a simultaneous tDCS-EEG investigation Méadhbh Brosnan **09.45 - 10.00**	**Rasmussen Syndrome: Cognitive trajectories and brain changes** Sarah Rudebeck **09.45 - 10.00**
Keynote Presentation: Cathy Price, From Neuropsychology to Neuroimaging and back again **10.30 - 11.30**			
President's address: Kathleen Haaland, Cognitive and Motor Aspects of Limb Apraxia **11.30 - 12.30**			
Keynote Presentation: Barbara Wilson, Assessment and management of people with a disorder of consciousness **14.00 - 15.00**			

Friday 8th July 2016
Parallel Session G - 15.30 - 17.00

Invited Symposium Session **15.30 - 17.00**	**Symposium Session** **15.30 - 17.00**	**Symposium Session** **15.30 - 17.00**	**Symposium Session** **15.30 - 16.30**
Ballroom A	**Ballroom B**	**City Suite**	**Plaza Suite**
Integration of semantic and social knowledge to the encoding, retrieval, and simulation of past and future episodes Co-Convenors: Francis Eustache, Pierre Gagnepain and Armelle Viard Speakers: Marlieke van Kesteren, Pierre Gagnepain, Roland G. Benoit, Armelle Viard **15.30 - 17.00**	**Living with cognitive disability: innovations in neuropsychological assessment and rehabilitation for people with progressive neurodegenerative conditions** Convenor: Linda Clare Discussant: Robin Morris Speakers: Dawn Langdon, Aileen Ho, Laura Goldstein, Aleksandra Kudlicka, Tamlyn Watermeyer **15.30 - 17.00**	**The clinical utility of neuropsychological genetics: Treatment follows cognitive phenotyping** Convenor: Jos Egger Discussant: Tjitske Kleefstra Speakers: Tjitske Kleefstra, Jos Egger, Karlijn Vermeulen, Linde Van Dongen, Renée Roelofs **15.30 - 17.00**	**Complexity of assessment for people in prolonged disorders of consciousness** Convenor: Anita Rose Discussant: Agnes Shiel Speakers: Milla Johnson, Samira Dhamapurkar, Olivia Gosseries **15.30 - 16.30**

Wednesday 6th July 2016
Poster Session 1 - 11.00 - 13.00

Including Aging, Mild Cognitive Impairment, Medical/Neurological Disorders (Adult), Medical/Neurological Disorders (Child), Behavioral Neurology/Cerebral Lateralization

Aging
Poster Session 1 - 11.00 - 13.00, Ballroom Foyer (Floor -2)

Presenter	Poster Title
Alfonso Caracuel	Computerized verbal memory training in the elderly with VIRTRA-EL: a free cognitive stimulation software
Katerina Cechova	Episodic-like memory changes during healthy aging
Daniel Cox	Hippocampal subfield diffusivity changes and recollection memory in healthy ageing
Davide Crivelli	Executive functions empowerment in healthy aging: what about electrophysiological markers?
Catherine Crompton	Collaborative learning in healthy aging: Does interlocutor identity matter?
Aviah Gvion	Lexical retrieval in healthy aging
Takeshi Hatta	Cognitive age-related decline is more prominent in executive function than in elementary perceptual speed: evidence from the Yakumo Longitudinal Study
Meng-Yang Ho	Testing the difference engine model of processing speed in older participants
Akihiko Iwahara	Prenatal sex hormone exposure (2D:4D) and cognitive functions in middle aged and older adults
Gitit Kave	A longitudinal study of demographic effects on naming people and objects after age 70
Jose Lara-Ruiz	Pattern of ADL performance across older adults with different types of cognitive impairment
Alejandra Machado	Age prediction by means of multiple cognitive measures: a novel multivariate approach in normal aging
Hana Markova	Prevalence of subjective cognitive complaints and association with cognition and depressivity in healthy elderly: data from Czech NANOK study
Yaiza Molina	Size of the intervals of comparison or critical points in the detection of cognitive and neuroanatomical decline in normal aging
Johanna Nijsten	Dying of apathy: the prognostic value of apathy on mortality in Nursing Homes
Tomas Nikolai	Czech normative data for older adults of Uniform Data Set neuropsychological test battery
Roxanna Rosen	Patient performance and self-reported functionality on the RBANS and WHODAS among elder adults on a psychiatric inpatient unit
Miranda Smit	Developmental patters of visuotactile prediction in peripersonal space
Artemis Stefani	Executive functioning performance among older Cypriots with depression symptoms: Results from the neurocognitive study on aging

Mild Cognitive Impairment
Poster Session 1 - 11.00 - 13.00, Ballroom Foyer (Floor -2)

Presenter	Poster Title
Pilar Andres	In-Out test: diagnosis of mild cognitive impairment with a new cognitive paradigm
Elina Boycheva	Cognitive domains of the Mattis Dementia Rating Scale-2 for prediction of conversion to dementia in amnestic mild cognitive impairment
Alfonso Caracuel	The Addenbrooke's Cognitive Examination, ACE-III: a brief screening tool for mild cognitive impairment

Nidhi Dev	Predictive value of standard neuropsychological tests in amnestic mild cognitive impairment: A three year follow up study.
Adela Fendrych Mazancova	Frontal Assessment Battery: Validity in Parkinson's disease, mild cognitive impairment, and Czech normative data
Sara Fernández-Guinea	Cognitive phenotypes to differentiate between normal and pathological aging: The role of executive functions.
Sara Fernández-Guinea	What do executive functions tell us about the evolution of mild cognitive impairment?
Mau-Sun Hua	Deterioration and predictive values of semantic clustering in amnestic mild cognitive impairment
Masashi Odagiri	Subtle changes of functional ability in patients with mild cognitive impairment: quantitative analysis using an eye-tracking system
Marco Timpano Sportiello	Differences in memory profile between PD-MCI patients and MCI patients of different etiologies on the Wechsler Memory Scale-IV

Medical/Neurological Disorders (Adult)
Poster Session 1 - 11.00 - 13.00, Plaza Foyer (Floor -4)

Presenter	Poster Title
Stuart Anderson	Neuropsychological outcome of cerebral malaria: An adult case study
Linda Byrne	A meta-analysis and systematic review of the effects of deep brain stimulation (DBS) on cognition
Benjamin Deck	The cognitive profile of statin users in Parkinson Disease
Irati Esnal	Prolonged mechanical ventilation is associated with verbal memory worsening in ICU survivors at hospital discharge
Sol Fernandez-Gonzalo	Neurocognitive and psychopathological sequelae in medical and surgical critically ill survivors: the relationship with clinical variables during ICU stay
Maite Garolera	Body Mass Index and subjective anxiety as predictors of worse cognitive outcome
Maite Garolera	Subtle frontal deficits in young adults with familial hypercholesterolemia
Yen-Hsuan Hsu	White matter degradation of the anterior thalamic radiation correlates with encoding deficit in cerebral small vessel disease: a preliminary diffusion tensor imaging study
Janneke Koerts	Medical decision-making in patients with Parkinson's disease
Janneke Koerts	Working capacity of patients with Parkinson's disease - a systematic review
Lenka Kramska	Cognitive performance in primary Whipple's disease of the brain – a case report
John Lucas	Long-term verbal fluency and verbal memory outcomes following left-side tandem and single-target deep brain stimulation in Parkinson's disease
Linda Monaci	Exploring the psychometric proprieties of the Personal Problems Questionnaire in a sample of chronic pain patients and in a healthy community norming sample
Eva Nekvapilova	Diabetic neuropathic pain: catastrophizing as a predictor of pain intensity and disability

Medical/Neurological Disorders (Child)
Poster Session 1 - 11.00 - 13.00, Plaza Foyer (Floor -4)

Presenter	Poster Title
Laurie-Anne Dion	Sex-specific effect of long-term exposure to manganese in water on IQ in adolescents.
Anna Hood	A meta-analysis of cognitive deficits in children with sickle cell disease: the impact of cerebrovascular disease
Georgia Pitts	Damage to subcortical white matter microstructure after severe and recurrent hypoglycaemia
Susan Rose	Towards understanding the cognitive phenotype of Rett's Syndrome
Susan Rose	Attention in children with Rett Syndrome: Anticipatory and reactive saccades
Robyn Stargatt	Behavioural executive function in pre-school children with cerebral palsy
Emily Talbot	Acute disseminated encephalomyelitis (ADEM) in childhood: A case series

Behavioral Neurology/Cerebral Lateralization Poster Session 1 - 11.00 - 13.00, Plaza Foyer (Floor -4)	
Presenter	**Poster Title**
Henrietta Howells	The left frontal aslant tract is important for written communication regardless of handedness
Yuko Meguro	A case presenting delusions of pregnancy after anterior communicating artery aneurysm rupture.
Stefano Sandrone	Myelin mapping of the corpus callosum: discrepancy between *in vivo* T1-weighted/T2-weighted MRI and post-mortem histology
Aleksandra Wojtowicz	The influence of right and left deviations of spatial attention on emotional picture recognition

Wednesday 6th July 2016
Poster Session 2 - 14.30 - 17.00

Including Dementia (Alzheimer's disease), Dementia (non-Alzheimer's disease), Multiple Sclerosis/ ALS/demyelinating, Drug/ Toxin related disorders (including alcoholism), Cancer, HIV/AIDS/infectious disease, Cross cultural

Dementia (Alzheimer's Disease) Poster Session 2 - 14.30 - 17.00, Ballroom Foyer (Floor -2)	
Presenter	**Poster Title**
Sarah Banks	Relationship between CSF biomarkers, hippocampal volumes and performance on neuropsychological tests
Eva Bolcekova	RBANS cognitive profiles of patients with different neurodegenerative diseases
Juhee Chin	The characteristics of sleep problems in patients with subjective memory impairment, amnestic mild cognitive impairment and Alzheimer's disease
Israel Contador	Influence of education on cognitive decline in older adults with dementia: A longitudinal population-based study (NEDICES)
Mireia Hernández	Does the greater efficiency of executive control of bilinguals act as a compensatory mechanism against cognitive decline?
Emi Ito	Efficient use of verbal fluency tests to detect dementia in terms of sensitivity and specificity
Andrew Kirk	Declining use of anticholinergic medications over eleven years in patients referred to a rural and remote memory clinic
Sylvie Martins	Self-defining memories in Alzheimer's disease and normal aging
Anthony Martyr	Awareness of functional ability in people with early-stage dementia
Jwala Narayanan	The Fifteen minute Assessment of Cognition over the Telephone (FACT): A telephone interview to detect and monitor cognitive deficits in dementia
Hanne Rollinger	Transformation formulae between the Mini Mental Status Examination (MMSE) and the Montreal Cognitive Assessment (MoCA) and screening properties of the MoCA
Sushmita Sircar	Distinguishing Alzheimer's disease from vascular dementia by examining pattern of executive function errors
Julie Suhr	Does subjective cognitive decline accurately reflect cognitive functioning?
Lynette Tippett	Self-continuity and narrative identity in mild cognitive impairment and early Alzheimer's disease
Clara Vila-Castelar	Early predictors of response to donepezil in Alzheimer's disease: sensitive attention measures of accuracy and variability predict future neuropsychiatric function

Dementia (non-Alzheimer's Disease)/ Small vessel disease Poster Session 2 - 14.30 - 17.00, Ballroom Foyer (Floor -2)	
Presenter	**Poster Title**
Alba Gavaldà	Robot syndrome: A case of severe emotional aprosody as the onset of frontotemporal dementia
Atsuko Hayashi	A Japanese patient with primary progressive aphasia (PPA) characterized by logopenic progressive aphasia (LPA) and semantic dementia (SD): A 3-year follow-up study
Hanna Jokinen	Cognitive reserve as a predictor and moderator of long-term cognitive and functional outcome in cerebral small vessel disease
Linda Jütten	Do informal caregivers of people with dementia mirror the cognitive deficits of their demented patients? - a pilot study
Valerie Lohner	Apathy, but not depression, is associated with executive dysfunction in cerebral small vessel disease

Catherine Merck	Does the left posterior fusiform gyrus play a critical role in fruit and vegetables categorization? Evidence from 19 semantic dementia patients
Otto Pedraza	Visuoperception in dementia with Lewy bodies
Masahito Takagi	Epilepsy complicates verbal function of primary progressive aphasia

Multiple Sclerosis
Poster Session 2 - 14.30 - 17.00, Ballroom Foyer (Floor -2)

Presenter	Poster Title
John DeLuca	Assessing everyday life performance using a web-based assessment: Actual Reality™
Rachel Goodwin	Evaluation of NeuroText as a memory aid for people with multiple sclerosis: a qualitative inquiry of patient feedback
Gabriel Leonard	Non-invasive neuromodulation combined with intensive cognitive and physical rehabilitation induces neuroplastic changes in patients with multiple sclerosis - an fMRI study
Micaela Mitolo	Network-based cognitive rehabilitation in patients with relapsing-remitting multiple sclerosis: functional and structural connectivity changes
Cristina Roman	Cognitive intra-individual variability (C-IIV) predicts brain atrophy in multiple sclerosis

Substance Abuse/ Addiction/ Alcoholism
Poster Session 2 - 14.30 - 17.00, Plaza Foyer (Floor -4)

Presenter	Poster Title
Omar Alhassoon	Role of group mismatching on education in verbal versus nonverbal memory differences among recently detoxified alcohol-dependent patients
Michela Balconi	Brain oscillations, inhibitory control mechanisms and rewarding bias in internet addiction
Sarai Boelema	The absence of differences in neuropsychological functioning between adolescent alcohol users and abstainers. Longitudinal findings from the TRAILS study
Mariana Cherner	COMT Val^{158}Met allele may exacerbate methamphetamine-related learning dysfunction
Alena Javurkova	Cognition in chronic nonmalignant pain patients under long-term opioid therapy
Myung-Sun Kim	Neuropsychological profile of college students with binge drinking
Serge Walvoort	Measuring illness insight in patients with alcohol-related cognitive dysfunctions using the Q8 questionnaire: A validation study

Cancer
Poster Session 2 - 14.30 - 17.00, Plaza Foyer (Floor -4)

Presenter	Poster Title
Bénédicte Giffard	Cognitive performance and grey matter volume prior and after breast cancer chemotherapy
Sophie Rijnen	Computerized neuropsychological screening in clinical care for patients with low-grade gliomas: incidence and severity of cognitive deficits
Martine van Zandvoort	The feasibility of testing working memory in awake craniotomy in tumor Patients
Eline Verhaak	Cognitive functioning in patients with 1-10 brain metastases scheduled for treatment with Gamma Knife radiosurgery

HIV/AIDS/infectious disease
Poster Session 2 - 14.30 - 17.00, Plaza Foyer (Floor -4)

Presenter	Poster Title
Silvia Cañizares	Inflammation and cardiovascular biomarkers are associated with cognitive performance in HIV patients.
M.H.M. Ensing	Switching to a non-Efavirenz containing regime improves cognition in HIV-infected patients
Naledi Ketlogetswe	Judgment/problem-solving and neuropsychological test performance in non-demented older adults with HIV
Garau Maria	How do the immunological state and years of evolution affect cognitive performance in HIV patients co-infected with HCV?
Sean B. Rourke	Contributions of social determinants of health and medical comorbidities to neurocognitive performance in people living with HIV: Population health results from the Ontario HIV Treatment Network (OHTN) Cohort Study
Marta Sobańska	The numerical Stroop task helps detect subtle decline in executive functioning in HIV-infected patients on effective HAART

Cross cultural Poster Session 2 - 14.30 - 17.00, Plaza Foyer (Floor -4)	
Presenter	**Poster Title**
Jerzy -Marek Celinski	Toward a culturally fair comparison between CARB and PsychoAssistant.
Aparna Dutt	Adaptation of the ACE III naming test for the Bengali speaking population: Approach to reduce cultural bias
Noorjehan Joosub-Vawda	Aspiring towards a model of cross-cultural neuropsychological rehabilitation in South Africa
Ranita Nandi	Cognitive abilities and knowledge base in urban Indian Illiterates: A pilot study
Tyler Owens	Foreign language triage service for neuropsychological assessment in an academic medical center: A program development case study
Arleta Starza-Smith	Cultural complexity in paediatric neuropsychological assessment and formulation
Parisuth Sumransub	Validity of Thai Addenbrooke's Cognitive Examination III (Thai-ACE III) and Thai Prospective and Retrospective Memory Questionnaire (Thai-PRMQ) in the detection of early stage Alzheimer's disease
Sze Yan Tay	Effects of cognitive reserve on performance of MOCA in healthy elderly adults
Sze Yan Tay	Validity and utility of the Singapore Famous Faces Test (SFFT) in the detection of cognitive impairments
Nataliya Varako	East and West traditions in neuropsychological rehabilitation: building bridges

Thursday 7th July 2016
Poster Session 3 - 08.30 - 10.30

Including Memory Functions, Visuospatial Functions/Neglect/Agnosia, Cognitive Neuroscience, Emotional Processes, Executive Functions/Frontal Lobes, Imaging (Functional), Imaging (Structural)

Memory Functions Poster Session 3 - 08.30 - 10.30, Ballroom Foyer (Floor -2)	
Presenter	**Poster Title**
Emily Aiken	An individualized approach to cognitive rehabilitation of prospective memory deficits in individuals with traumatic brain injury
Linas Bieliauskas	Predicting subjective cognitive complaints: Contributions from depression, somatic preoccupation, and education level among older inpatient veterans admitted to a post-acute clinic
Liam Dorris	Sleep and forgetting in children with genetic generalised epilepsy.
Aparna Dutt	False recognition in behavioural variant frontotemporal dementia and Alzheimer's disease – disinhibition or amnesia?
Anna Dzieciol	Distinct white matter correlates of intelligence and memory: Evidence from developmental amnesia
Kazuki Nakamichi	Dissociable effects of facial expression and facial impression on memory for faces in Williams syndrome
Amanda Ng	Metacognition in prospective memory – A meta-analysis
Paeksoon Park	Remembering the past and imagining the future in patients with gambling disorder: a preliminary report
Judith Salvador-Cruz	The use of semantic strategies in the development of memory in elementary school children
Eli Vakil	Conceptual and perceptual processes involved in context effect in memory: Behavioral and eye tracking measures
Marta Agata Witkowska	Can you train your prospective memory by playing video games? A professional players perspective

Visuospatial Functions/Neglect/Agnosia Poster Session 3 - 08.30 - 10.30, Ballroom Foyer (Floor -2)	
Presenter	**Poster Title**
Lisa Arduino	A new interpretative model of neglect dyslexia and its rehabilitative application
Kentaro Hiromitsu	Out-of-body experiences following the posterior cingulate lesion
Tobias Loetscher	Impaired spatial perception in Cervical Dystonia?

Vincenza Montedoro	The development of an integrative visual-robotic diagnosis test for hemi-neglect
Elena Olgiati	Dissecting the mechanisms underlying reward effects in visual neglect
Radek Ptak	Early event-related activity predicts visual binding errors after bilateral parietal damage
Anouk Smits	Impact of lesion aetiology in a stroke and tumour population on the Rey-Osterreith complex figure

Cognitive Neuroscience
Poster Session 3 - 08.30 - 10.30, Ballroom Foyer (Floor -2)

Presenter	Poster Title
Michela Balconi	Competition in the brain: social, cognitive and personality effects
Daniel Blackburn	Conversation analysis in the memory clinic- Distinguishing dementia from functional memory disorder
Isabel Cando	Cognitive development of children or rural highlands in Chimborazo Ecuador: Association with stunting
Mélissa Chauret	Fear circuitry function through adolescence: influence of cerebral maturation and sex on emotional regulation
Jeanyung Chey	Opposing effects of stress on model-based choice behavior and its neural correlates
YanHong Dong	Cognitive trajectory and predictors for cognitive decline in Singaporean older adults with vascular cognitive impairment
Amy Peters	Acute stress-induced cortisol elevations attenuate engagement of fronto-striatal circuitry during emotion processing in depression
Maneet Saini	Emergence of cognitive, language and motor impairment associated with the mutation of the FOXP2 gene in a preverbal infant
Irene Venturella	The role of emotion on body ownership and the rubber hand illusion: an EEG-NIRS study

Emotional Processes
Poster Session 3 - 08.30 - 10.30, Plaza Foyer (Floor -4)

Presenter	Poster Title
Tanvi Dingankar	Emotional processing in anxiety using the face adaptation paradigm: An evoked potential study
Tricia King	An fMRI study of the individual variation in the oxytocin-mediated tendency to anthropomorphize in women
Catarina Kordsachia	Visual attention to the eye region of human faces predicts emotion recognition performance in Huntington's disease

Executive Functions/Frontal Lobes
Poster Session 3 - 08.30 - 10.30, Plaza Foyer (Floor -4)

Presenter	Poster Title
Omar Alhassoon	Inhibitory control in alcohol use disorder: Implications for cognitive rehabilitation
Lauren Bolden	Cortical excitability is related to attention, executive function, and mood in healthy adults
Maraike Coenen	Cognitive problems and mood in children with primary and secondary dystonia
Francesca Eleuteri	Effects of tobacco withdrawal on executive functions
Zahra Farahmand	Facial emotion recognition and its relationship with executive functions in bipolar I patients and healthy controls
Anders Gade	Switch if you can: A comparison of phonemic, semantic and alternating fluency, and fluency switching, in pre-manifest and manifest Huntington disease.
Samara Hussain	Bilingual advantage: Language proficiencies and inhibitory control in real-life like environment using E-prime
Tiffany Ip	Dissecting the role of the left middle frontal gyrus in Chinese reading: How important are the executive control processes?
Denise LaBelle	Dissociation of executive and attentional elements of the digit span task in a population of older adults: A Latent class analysis
FA Jonker	Graph theoretical approach: the bridge between cognition and behavior?
Anthony Martyr	Assessing inhibitory control in early-stage dementia and Parkinson's disease using the Hayling Test
Rui Mateus Joaquim	Deficits of operating memory and support of attention in teenagers with cleft palate

Executive Functions/Frontal Lobes Poster Session 3 - 08.30 - 10.30, Plaza Foyer (Floor -4)	
Presenter	**Poster Title**
Chiharu Niki	Change of performance of Iowa gambling task (IGT) after brain damage: comparison pre and post operation in patients with glioma
Graham Pluck	Frontal lobe contributions to academic achievement of university students
Graham Pluck	Preserved executive planning ability in 'at-risk' adolescents living in foster care homes
Marcos Rios-Lago	Dissociations after psychosurgery in obsessive-compulsive disorder: A case-controls design
Jaan Tulviste	TMS over the DLPFC induced changes in the selection bias in a non-veridical decision making task.
Francesco Vergani	The pre-SMA is a major hub for higher cognitive functions
Kim Verweij	Neuroanatomical correlates in the Stroop interference condition: a systematic review
Marta Witkowska	Executive control of hypertension patients - an fMRI study

Imaging (Functional) Poster Session 3 - 08.30 - 10.30, Plaza Foyer (Floor -4)	
Presenter	**Poster Title**
Marta Aliño Costa	fMRI results using auditory emotional paradigm in different mental disorders: a systematic review
Fumiko Anzaki	Brain activities of a Japanese man with developmental stuttering in hearing and repetition tasks measured using functional near-infrared spectroscopy
Scott Langenecker	Cognitive control network connectivity and cognitive control task activation predict relapse of depression in young adults
Alex Marsh	Investigation of visuospatial memory lateralisation in temporal lobe epilepsy and health participants
Eliane Miotto	Verbal episodic memory neural correlates in patients with left frontal stroke lesions
Jessica Vicentini	Worse cognitive performance is associated to default mode network abnormalities in subacute ischemic stroke

Imaging (Structural) Poster Session 3 - 08.30 - 10.30, Plaza Foyer (Floor -4)	
Presenter	**Poster Title**
Francisco De Santiago Requejo	The long way from connectomics to cognition: Can we trust connectomics metrics based on tractography?
Flavio Dell'Acqua	Scaling-up human brain networks analysis in large tractography datasets with MegaTrack
E Wallace	Diffusion tensor imaging changes following adult traumatic brain injury: A meta-analysis

Thursday 7th July 2016
Poster Session 4 - 14.00 - 16.00

Including Assessment/Psychometrics/Methods (Adult), Assessment/Psychometrics/Methods (Child), Cognitive Intervention/Rehabilitation

Assessment/Psychometrics/Methods (Adult) Poster Session 4 - 14.00 - 16.00, Ballroom Foyer (Floor -2)	
Presenter	**Poster Title**
Joost Agelink van Rentergem	Minimizing false positives and enhancing sensitivity in normative comparisons: A user friendly stepdown resampling method
Asaad Baksh	Social cognition in adults with autism spectrum disorders - Validation of the Edinburgh Social Cognition Test (ESCoT)
Alberto Blanco-Campal	The Montreal Cognitive Assessment: A qualitative process approach version (MoCA-QPA)
Martin Bunnage	Performance validity test (PVT) failure rates in routine clinical neuropsychology practice within the National Health Service (NHS), UK
Ming-Shiou Chiang	A normative study on the Benton Visual Retention Test in Taiwan Sample
N.R. de Vent	Advanced Neuropsychological Diagnostics Infrastructure (ANDI): A novel normative database created from control datasets.

Unai Diaz-Orueta	European standardised process approach to cognitive evaluation in older people: project overview and preliminary results
Michael Ehrensperger	The German 7-item IQCODE - a validation study
Evgenia Gkintoni	Psychological distress and coping mechanisms in University students: A data mining approach
David Hardy	Inclusion of workload in neuropsychological assessment: A preliminary illustration with TBI patients
Sascha Meyer	Measuring cognitive change for normal aging, mild cognitive impairment and Alzheimer dementia: Reliable change index versus regression based index
Sascha Meyer	The whole continuum: visual associations to assess episodic memory from healthy persons to Alzheimer's disease.
Chiyoko Nagai	Eye movements during a scene description task: A pilot study of healthy subjects
Margaret Newson	Relationship between self-report of memory function on PRMQ and performance on standardized memory tests.
Yoko Okamura	Validation in Japanese of the Jansari assessment of executive functions (JEF©)
Liisa Elina Paavola	Still fit to drive? Evaluating the cognitive risk factors in traffic with elderly Finns
Robert Parish	Screening utility of three standalone neuropsychological validity measures in a military TBI clinic
Lisa Rapport	Response time patterns on the Warrington Recognition Memory Test in simulated and verified traumatic brain injury
María del Carmen Requena-Hernández	Normative data for the Rivermead Behavioral and Memory Test (RBMT) in Spanish older adults

Assessment/Psychometrics/Methods (Adult)
Poster Session 4 - 14.00 - 16.00, Ballroom Foyer (Floor -2)

Presenter	Poster Title
Panayiota Shoshilou	Measuring social cognition in Greek: Psychometric properties from an adaptation study in the adult Greek-Cypriot population
Isaac Tourgeman	Exploration of the Wechsler Memory Scale Fourth Edition and measures of executive function combined components model
Cathy Tran	Developing a culture fair Cognitive Estimates test
Ian van der Linde	Restandardisation of the National Adult Reading Test (NART) against the Wechsler Adult Intelligence Scale – 4th Edition (WAIS-IV)
Bjorn Vlaskamp	Non-dominant hand use increases completion time on TMT B but not on TMT A
Tay Sze Yan	A pilot study of the Singapore-Chinese version of Addenbrooke's Cognitive Exam III (ACE-III-SG-C) for detection of cognitive impairments

Assessment/Psychometrics/Methods (Child)
Poster Session 4 - 14.00 - 16.00, Ballroom Foyer (Floor -2)

Presenter	Poster Title
Kathryn McLennan	The relationship between subjective and objective measures of Executive Function and theory of mind in childhood
Judith Salvador-Cruz	ESNB-Mx (Escala de Signos Neuropsicológicos Blandos-Mexico): A new scale for assessing soft neurological signs in Mexican school children

Cognitive Intervention/Rehabilitation
Poster Session 4 - 14.00 - 16.00, Plaza Foyer (Floor -4)

Presenter	Poster Title
Tomoko Akamatsu	The effect of rehabilitation tourism for frontal lobe functions of people with Parkinson's disease in Japan
Marie Alsamour	Using action observation therapy for the treatment of hemiplegic cerebral palsy
Alfonso Caracuel	Can ICT-Based neuropsychological rehabilitation be effective in improving cognition or participation in brain-injury patients?
Raymond Chan	The transfer effect of working memory training to enhance hedonic processing in individuals with social anhedonia: A preliminary functional imaging study
Laia Costa Samarra	Additional effect of early neurocognitive rehabilitation on executive cognitive function in subacute stroke patients, in the context of intensive rehabilitation program

Matteo De Marco	Cognitive stimulation of the default-mode network in patients with mild cognitive impairment
Elisa Di Rosa	Cognitive reserve and neuropsychological rehabilitation: evidence from patients with acquired brain injury
YanHong Dong	Efficacy evaluation of a group- based cognitive intervention program for Asian patients with mild cognitive impairment: A pilot study
Liam Dorris	An exploratory RCT psychosocial group intervention for young people with epilepsy (PIE trial): 6-week post-intervention outcomes.
Ana Lúcia Faria	Personalizing cognitive rehabilitation through a web-based task generator: an evaluation study with stroke patients
Carmen García-Sánchez	Intensive melodic intonation in group therapy of chronic aphasic patients: Improves quality and frequency communication.
Maite Garolera	Neuropsychological and functional outcomes to cognitive stimulation therapy in Alzheimer's Disease: same profile in responders and non-responders?
Therese Gilligan	Rethinking the hemispheric re-balancing account of prism adaptation
Jenni Heikkilä	Audiovisual speech training for children with specific language impairment (SLI)
Wanping Huang	Cognitive improvement after cranioplasty: A rehabilitation perspective

Cognitive Intervention/Rehabilitation Poster Session 4 - 14.00 - 16.00, Plaza Foyer (Floor -4)	
Presenter	**Poster Title**
Nicole Hudl	Functional plasticity in the healthy elderly - A working memory training study
Kaisa Kanerva	Could a metamemory training support working memory intervention in preschool-aged children?
Narinder Kapur	Smartwatches can help in memory rehabilitation
Clare Kempnich	Brief computerized training to improve emotion recognition in Huntington's disease: A pilot study
Raquel López García	Neuropsychological intervention in a crossed aphasia patient
Joseph Maes	Training and transfer effects of response inhibition training in children and adults
Vesna Mlinarič Lešnik	The effects of the mindfulness based cognitive rehabilitation programme GOALS on processing speed, distractibility and mental flexibility
Jessica Morales Hernández	Neuropsychological intervention under the model of rehabilitative teaching in a patient with sequelae of cerebrovascular accident (CVA).
Emilie Ouellet	Memory training in persons with subjective cognitive decline: virtual reality and transfer
Ana Paula Pereira	Qualitative perspective in service evaluation of neuropsychological rehabilitation program
Sophie van der Linden	Home-based cognitive rehabilitation in brain tumor patients: Feasibility of the evidence-based ReMind program
Natalia Varako	Integration of neurofeedback into holistic model of neurorehabilitation

Friday 8th July 2016
Poster Session 5 - 08.30 - 10.30

Including Acquired Brain Injury, including TBI/Cerebrovascular Injury and Disease (Adult), Acquired Brain Injury, including TBI/ Cerebrovascular Injury and Disease (Child), Psychopathology/Neuropsychiatry (Including Schizophrenia), Forensic Neuropsychology

Acquired Brain Injury, including TBI/ Cerebrovascular Injury and Disease (Adult) Poster Session 5 - 08.30 - 10.30, Ballroom Foyer (Floor -2)	
Presenter	**Poster Title**
Tatiana Aboulafia Brakha	Effects of group psychotherapy on anger management following acquired brain injury
Mark Allen	Standardization of quantitative-fMRI for neurocognitive assessment and rehabilitation of mTBI
Alina Fong	Assessing longitudinal neurorehabilitative outcomes using the standardized application of fNCI in mTBI
Noga Balaban	Learning from right brain damaged individuals about two aspects of meaning
Alfonso Caracuel	CloudRehab: An app for the patient´s empowerment after acquired brain damage
Silvia Chapman	Personality correlates of anosognosia: A pilot study

Jacinta Douglas	Marital coping and satisfaction following severe traumatic brain injury
Alba Gómez	Neuropsychological and behavioral assessment after surgical repair of incidental unruptured intracranial aneurysms.
Sarah Hall	Examining the importance of skills in perceiving, understanding and regulating emotions for community integration after acquired brain injury
Ana Havelka Mestrovic	Personality changes following surgery of aneurism of brain arteries
Maria Hennessy	It's PTA Jim, but not as we know it.
Lenka Kramska	Neuropsychological performance after EC-IC bypass surgery – preliminary results.
Adriana Leveroni	Anterograde amnesia with preserved recognition: a case study of a bilateral fornix stroke
Graham Lowings	Educating adults with acquired brain injury: A practical guide to support adults with neurological conditions. (Supported by Internet based resources and guides)
Christine Padgett	Does Apolipoprotein ε4 interact with age or sex in cognitive function after traumatic brain injury?
Ana Paula Pereira	Social support and occupational aspects of adults after stroke
Andreea Rădoi	Subjective endorsement of cognitive postconcussional symptoms in a cohort of mild TBI patients. A pilot study
Caroline Roberts	Comparing semantic autobiographical memory performance in and out of post-traumatic amnesia
Dana Wong	The role of Valued Living following traumatic brain injury

Acquired Brain Injury, including TBI/ Cerebrovascular Injury and Disease (Adult)
Poster Session 5 - 08.30 - 10.30, Ballroom Foyer (Floor -2)

Presenter	Poster Title
Myrthe Scheenen	mTBI patients "at-risk" of suffering from persisting complaints: the role of coping, mood disorders and post-traumatic stress
Mitsuyo Shibasaki	Discrimination Thresholds for Recognizing facial emotions in patients with traumatic brain injury
Anna Suades	Decision-making after aneurysmal subarachnoid haemorrhage
Eleanor Williams	The impacts of "diagnosis threat" on neuropsychological assessment outcomes in individuals receiving clinical services for traumatic brain injury
Chi Cheng Yang	A follow-up investigation of work quality in patients with mild traumatic brain injury: Relationships between post-concussion symptoms, work status and work stability
Zai-Ting Yeh	Social cognition abilities following traumatic brain injury: The assessment of emotion expression and theory of mind

Acquired Brain Injury, including TBI/Cerebrovascular Injury and Disease (Child)
Poster Session 5 - 08.30 - 10.30, Ballroom Foyer (Floor -2)

Presenter	Poster Title
Rachael Elward	Emergence of motor and cognitive deficits in infants with transposition of the great arteries
Declan Heaslewood	Evolution of post-concussion symptoms in a consecutive sample of children presenting to the emergency department
Sian Hocking	“We knew our lives were changed forever from that point” - Parental Adjustment and the role of social support in paediatric acquired brain injury: An interpretative phenomenological analysis
Christianne Laliberté	Effect of the home environment on long-term executive functioning following early childhood traumatic brain injury
Janet Leathem	An examination of concussion symptom base rates in children aged 5-18 years
Steve Mahan	A systematic review of psychological interventions to rehabilitate prospective memory deficits as a consequence of acquired brain injury
Louise Owen	The Development of a self-harm pathway for assessing and supporting children and young people with acquired brain injury in a paediatric residential neurorehabilitation service.

Psychopathology/Neuropsychiatry (Including Schizophrenia)
Poster Session 5 - 08.30 - 10.30, Plaza Foyer (Floor -4)

Presenter	Poster Title

Michela Balconi	Emotion regulation in schizophrenia: Neurofeedback applications as assessed by EEG and optical imaging
Silvia Cámara-Barrio	Influence of education on cognitive and functional performance in patients with schizophrenia.
Judith Duijkers	Executive functioning in dual-diagnosis
Caroline East-Richard	Methodological quality and clinical relevance of meta-analyses on cognitive deficits in psychiatry: a systematic review
Peter Gallagher	Neurocognitive intra-individual variability in mood disorders: effect on attentional response time distributions

Psychopathology/Neuropsychiatry (Including Schizophrenia) Poster Session 5 - 08.30 - 10.30, Plaza Foyer (Floor -4)	
Presenter	**Poster Title**
Evgenia Gkintoni	Cognitive endophenotypes of affective and non-affective psychosis
Julia Jeschke	Evaluation of the efficacy of sociocognitive and neurocognitive training dedicated for patients with anorexia nervosa
Mie Matsui	Corpus callosum morphology in patients with first-episode schizophrenia: association with negative symptoms
Guillem Navarra	Social cognition in early phases of psychosis: A case-control study of gender-related differences
Dung Pham	Neural correlates of antidepressant treatment response in adolescents with major depressive disorder
Alexandra Mercier	Common transdiagnostic cognitive deficits among people with psychiatric disorders exposed to childhood maltreatment: A systematic review
Laura Smith	The neuropsychiatric sequelae of vestibular disorders
Sara Weisenbach	The double burden of age and disease on cognition and its underlying neural circuitry in major depressive disorder
Fenny Zwart	Is implicit learning intact in autism? Behavioral and ERP results from a statistical learning task

Forensic Neuropsychology Poster Session 5 - 08.30 - 10.30, Plaza Foyer (Floor -4)	
Presenter	**Poster Title**
Marek Celinski	Toward a culturally fair comparison between CARB and PsychoAssistant
Ashok Jansari	My brain made me do it: Using A new ecologically-valid assessment of executive functions to investigating the potential involvement of head injuries in subsequent criminal behaviour
Jaspreet Rai	Aggregating embedded validity indicators (EVIs) within Conners' CPT-II provides a better estimate of performance validity than cut-offs on individual scales in patients with traumatic brain injury

Friday 8th July 2016
Poster Session 6 - 15.00 - 17.00

Including Language and Speech Functions/aphasia, Epilepsy, Electrophysiology, Autistic spectrum disorders, ADHD, Genetic/ Genetic disorders, Learning disabilities/ Academic Skills

Language and Speech Functions/Aphasia Poster Session 6 - 15.00 - 17.00, Ballroom Foyer (Floor -2)	
Presenter	**Poster Title**
Cristina Aguillon-Solis	Effect of stimulus presentation time in Broca's aphasia reading
Gabriele Cattaneo	Between and within language control in Parkinson's disease
Ingrid Feiter	Cognitive differentiation of disorders in communication and social interaction in children with specific language Impairment and autism spectrum disorder
Naama Friedmann	Surface dyslexia as a result of a deficit to the phonological output lexicon
Mamiko Fujiwara	The relationship between the self-awareness and the monitoring function of the language disorders
Valentina Galetto	IMITAF: a computerised tool for the rehabilitation of anomic deficits in aphasic subjects
Gur Shalom	A dissociation between wh-movement and pronouns in syntactic impairment

Epilepsy Poster Session 6 - 15.00 - 17.00, Ballroom Foyer (Floor -2)	
Presenter	**Poster Title**
Mariana Cairós	Disadvantageous decision making in right temporal lobe epilepsy
Mariana Cairós	False recognition in mesial temporal lobe epilepsy: Differences between associative and semantic mechanism.
Silvia Cámara-Barrio	Neuropsychological spectrum of paediatric patients with refractory epilepsy and hypothalamic hamartoma
Silvia Cámara-Barrio	Analysis of neuropsychological findings in symptomatic and idiopathic Encephalopathy with Status Epilepticus during Sleep (ESES) syndrome
Tara Devoy	The Mirror Memory Task - Concurrent validity and sensitivity to temporal lobe dysfunction
Matthew Harris	Neuropsychological Assessment Battery (NAB) memory module performance in left versus right temporal lobe epilepsy
Dayra Hernández-Pérez	Neuropsychological characteristics in Mexican adults with frontal lobe epilepsy
Mayumi Hirozane	A short version of a naming test (the test of lexical processing in aphasia) for patients with temporal lobe epilepsy
Stephanie Pantelides	Spatial memory integration and recall in patients with idiopathic temporal lobe epilepsy: preliminary findings
Dalin Pulsipher	Performance of children and adolescents with epilepsy or psychogenic non-epileptic seizures on three measures of effort
Ana Paula Pereira	Cognitive rehabilitation of attentional processes in epilepsy
Arianna Stefanatos	Psychosocial functioning in children with frontal and temporal lobe epilepsy
Faraneh Vargha-Khadem	Factors predictive of emotional and behavioural difficulties in children with refractory focal epilepsy
Emilio Verche	Learning effects in a planning task in children and adults with frontal lobe epilepsy

Electrophysiology Poster Session 6 - 15.00 - 17.00, Ballroom Foyer (Floor -2)	
Presenter	**Poster Title**
Gerry Stefanatos	Electrophysiological markers of auditory processing deficits in word deafness

Autism Spectrum Disorders Poster Session 6 - 15.00 - 17.00, Plaza Foyer (Floor -4)	
Presenter	**Poster Title**
Eva Bonda	Neurocognitive enhancement in autism spectrum disorder
Yiwei Chen	Social Engagement and Communicative Style Project: Do gestures serve an interpersonal function?
Teruo Hashimoto	Functional connectivity during implicit intention holding in children with autism spectrum disorder
Monika Pudlo	Reaction time and errors in Attention Network Test in high functioning adolescents with ASD
Maria Elide Vanutelli	Resonance mechanisms in autistic children to human-human and human-animal emotional interactions. A combined study by EEG and autonomic activity recording.
Cristina Varanda	The role of mirror neurons in autism and the perspective of neurorehabilitation
Cristina Varanda	Enhancement of cognitive flexibility among subjects on the autism spectrum

ADHD Poster Session 6 - 15.00 - 17.00, Plaza Foyer (Floor -4)	
Presenter	**Poster Title**
Anselm Fuermaier	Detection of feigned adult ADHD with an Embedded Figures Test
Nella Korhonen	Subjective symptoms of ADHD at 40 years in a cohort with childhood ADHD followed from birth
Saleh Mohamed	Error monitoring and ADHD symptoms in adults: the effect of laterality and state regulation
Margaret Semrud-Clikeman	Unique white matter patterns in two presentations of ADHD using DTI

Genetics/Genetic Disorders Poster Session 6 - 15.00 - 17.00, Plaza Foyer (Floor -4)	
Presenter	**Poster Title**
Georgios Argyropoulos	Neocerebellar abnormalities in a neonate with the FOXP2 mutation
Silvia Cámara-Barrio	Role of molecular consequences or tuberous sclerosis complex mutations in neurodevelopmental level of affected children
Jos Egger	Genetic subtyping and its implications for clinical management: The case of 22q11.2 syndrome
Renée Roelofs	Intellectual development in Noonan syndrome: A longitudinal study
Ellen Wingbermühle	Quality of life in adults with Noonan syndrome

Learning Disabilities/Academic Skills Poster Session 6 - 15.00 - 17.00, Plaza Foyer (Floor -4)	
Presenter	**Poster Title**
Bettina Kuske	First application of a new developed neuropsychological assessment for early detection of dementia in people with intellectual disabilities
Bettina Kuske	Early detection of dementia in people with intellectual disabilities – Experiences, special features and difficulties
Michel Nelwan	Limited near and far transfer of jungle memory working memory training effects on learning mathematics in children with attentional and mathematical difficulties
Neta Salner	The effect of spatial attention on reading errors in normal reading, letter position dyslexia, and surface dyslexia
Annette Scheper	The role of executive functioning in narrative construction in children with specific language impairment
Maya Yachini	The distribution of various types of developmental dysgraphia

Abstracts Presented at the 2016 Mid-Year Meeting International Neuropsychological Society

July 6-8, 2016
London, England

WEDNESDAY 6TH JULY 2016 - PARALLEL SESSION A: 09.00 - 12.45

CE Session A – 9.00-10.45
Goal-oriented cognitive rehabilitation for people with early-stage dementia
Professor Linda Clare,
Professor of Clinical Psychology of Ageing and Dementia, REACH: The Centre for Research in Ageing and Cognitive Health, School of Psychology, College of Life and Environmental Sciences, University of Exeter
Cognitive rehabilitation (CR) for people with early-stage Alzheimer's or vascular dementia supports optimal functioning and seeks to enable people to live well with the condition. This is a personalised approach targeting individually-meaningful goals in the everyday setting. Goals are identified collaboratively, and rehabilitation therapists develop strategies for addressing these goals, based on an understanding of the individual's cognitive and functional capacity and intrinsic capability. Strategies draw on a range of evidence-based methods. These may be restorative, for example methods for learning or re-learning skills or information, or compensatory, for example using assistive memory aids. In this workshop we will begin by exploring the process of goal-setting for people with dementia and examining the goals set by over 200 participants in the GREAT program, an ongoing randomised controlled trial. We will review a range of evidence-based rehabilitative strategies that can be applied to support goal attainment, and use case examples from GREAT to demonstrate how these strategies can be put into practice. While the main focus of the workshop is on people with Alzheimer's disease and vascular dementia, CR is also relevant to other neurodegenerative conditions, as examples from the CORD-PD program for people with Parkinson's Disease Dementia will demonstrate.
Learning Objectives:
1. Outline the key components of a cognitive rehabilitation approach for people with early-stage Alzheimer's, vascular or mixed dementia
2. Describe a method of eliciting goals and evaluating goal attainment
3. Summarise the kinds of goals typically identified by people with dementia participating in a cognitive rehabilitation intervention
4. Give examples of evidence-based restorative and compensatory methods used in cognitive rehabilitation interventions for people with dementia
Correspondence: *Professor Linda Clare, University of Exeter, l.clare@exeter.ac.uk*

CE Session B – 9.00-10.45
Traumatic Brain Injury and Offending: Can neurorehabilitation reduce crime?
Associate Professor Huw Williams,
Associate Professor of Clinical Neuropsychology and Co-Director of the Centre for Clinical Neuropsychology Research (CCNR) at Exeter University
TBI can lead to lifelong cognitive, behavioural and emotional dysfunction. Behavioral disorders can cause social integration difficulties often associated with mood disorders. A Finnish birth cohort study, published in 2002, showed that a history of TBI in childhood or adolescence increased the risk of subjects becoming "mentally disordered offenders". A total population study in Sweden showed TBI to be a significant risk factor for crime. A history of TBI in adolescence has been significantly associated with subsequent lifetime criminality. Two recent meta-analyses show a prevalence reported TBI among prisoners as very high - respectively 60.25% and 41.2%. Several studies have highlighted that prisoners with TBIs have more mental health problems, greater drug misuse, suffer significantly more and are more violent in offending – typically from a younger age. These trends are found across jurisdictions – such as USA, Australia, Canada, France and UK. There are moves, internationally, to improve justice systems to be more responsive to TBIs and other neuro-disabilities. Particularly as such factors may be related to socio-emotional immaturity in affected individuals. Furthermore, developmental maturity is now being adopted as a key factor in sentencing policy. This workshop will give an opportunity to hear about work to improve understanding of the links between TBI and criminality and for management of TBI issues in offenders. In particular about assessment and interventions within custodial and community justice systems. There will also be consideration to neurorehabilitation within schools to reduce likelihood of a "drift" into crime by children with TBI. Cost saving, drawing on health economic models, will be highlighted. It is argued that bringing the expertise of neurorehabilitation into justice systems could not only have a major impact on the lives of offenders with TBI but wider society.
This workshop is designed to help you:
1. Describe how TBI is linked to crime
2. Explain the role of adversity in offending behaviour
3. Recognise key factors that increase risk of crime after TBI
4. Utilise case illustrations to compare means for rehabilitation in forensic settings
5. Apply theoretical models in neuropsychology to case examples from own practice
6. Identify key target areas for improved adoption of neuro-rehabilitation in justice systems globally
Correspondence: *Associate Professor Huw Williams, University of Exeter, w.h.williams@exeter.ac.uk*

CE Session C – 11.00-12.45
Home or Outpatient based Holistic Rehabilitation: Helping Clients Understand Brain Injury
Professor Barbara A Wilson,
The Oliver Zangwill Centre for Neuropsychological Rehabilitation
This workshop has grown out of the psychoeducation groups run for people with acquired brain injury who attend the Oliver Zangwill Centre (OZC) for Neuropsychological Rehabilitation. All clients receive both group and individual therapy. In the first six weeks educational groups are held each morning. Following an induction week, the remaining five weeks concentrate on: understanding brain injury, attention and memory, executive functions, communication and mood. Not all survivors of acquired brain injury will be able to be

seen by an experienced interdisciplinary team; many therapists and psychologists are working alone and may see patients at best on a weekly basis in a hospital or clinic. They may be seeing people at home or they may be using the internet or Skype to provide services. This workshop is intended for these professionals. Our programme can be adapted for individuals and outpatients.
An outline of the programme is covered with some examples of the worksheets provided for clients. We discuss 1) brain structure and function (what happens when you have a traumatic brain injury, stroke, encephalitis or hypoxic damage); 2) common problems faced by survivors of brain injury (attention; memory; executive functions; mood; communication and fatigue) and 3) who am I now (personal identity change and family issues).
Correspondence: *Professor Barbara A Wilson, The Oliver Zangwill Centre for Neuropsychological Rehabilitation, barbara.wilson00@gmail.com*

CE Session D – 11.00-12.45
Learning from your mistakes? Errorless learning in amnesia and dementia
Professor Roy Kessels, PhD,
Professor of Neuropsychology, Radboud University Nijmegen; and clinical neuropsychologist at the Department of Medical Psychology, Radboud University Medical Center and Vincent van Gogh Institute of Psychiatry, Venray, the Netherlands
Patients with an amnesic syndrome or dementia have profound deficits in explicit anterograde memory, while implicit learning is relatively spared. In clinical practice though, it is complicated to assess implicit learning capacity and to apply it in setting up interventions aimed at the acquisition of new information or skills. Errorless learning is a concept that optimizes residual learning capacity in amnesic patients by reducing errors or interference during learning. This approach may increase the patients' independence and reduce their care burden. This workshop will introduce the fundamentals of this approach first. Second, studies that have applied errorless learning in amnesia or dementia will be discussed. Third, I will describe how the principle of errorless learning can be applied in clinical practice, providing examples from daily practice and advice on implementation, including sample scripts and step-by-step instructions based on a recently developed practical manual. The workshop is targeted at (clinical) neuropsychologists working with amnesia/dementia patients or those who supervise formal caregivers in e.g. memory clinics, general hospitals, psychiatric hospitals or rehabilitation centers. After participation, the learner is able to (1) describe the theory behind errorless learning, (2) select everyday tasks suitable for this approach and (3) design an errorless learning intervention.
Correspondence: *Professor Roy Kessels, Donders Centre for Cognition, r.kessels@donders.ru.nl*

INS Student Committee Hosted Workshop – 9.00-11.30
Moving with the times: How we can integrate novel technologies into our research and clinical work
Speaker: Dr Thomas Parsons, University of North Texas
Facilitator: Coco Bernard, Monash University
Abstract: Virtual reality-based neuropsychological assessments are a relatively new iteration of computerized neuropsychological assessment devices. The increasing availability of sophisticated simulation technologies (e.g., virtual and augmented reality) offers potential for enhancing current approaches to neuropsychological assessment of cognition, affect, and real-life activities of daily living. The advanced computer interfaces found in virtual reality offer potential for enhancing the accuracy in recording, coding, and storing of a range of neurobehavioral responses elicited from complex stimuli. Virtual environments may be uniquely suited for assessment of daily activities, allowing for presentation of three-dimensional objects in a consistent and precise manner, which participants can then manipulate depending on a range of task demands. The precise presentation and control of dynamic perceptual stimuli (e.g., visual, auditory, olfactory, and haptic) in the virtual environment offers neuropsychologists the opportunity to develop statistically and clinically significant tasks within a virtual world. Research conducted using both "construct driven" and "function led" approaches to virtual reality-based neuropsychological assessments will be discussed. Emphasis will be placed upon the need to develop virtual reality-based neuropsychological assessments that include 1) the control and rigour of technologically advanced computerized laboratory measures, 2) the psychometric rigour of traditional paper-and-pencil assessments, and 3) the representativeness of simulations approximating real life situations. The talk will conclude with some discussion of the need for rigorous analysis of the psychometric properties of virtual environments.
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Oral Presentation Session: Medical conditions – 09.00 - 10.30

Ownership and self-attribution in illusory movements: the role of parietal structures
Davide Crivelli, Marco Bove, Michela Balconi
Objectives: The sense of body-ownership grounds on the ability to feel our bodies as part of an experience. Conscious recognition of ourselves as intentional agents, instead, allows us to develop a sense of agency. The development of both body-ownership and agency self-attribution is based on integrated processing of sensory-motor information in a neural network including prefrontal, pre-/motor and parietal regions. The present study aimed at investigating their involvement in consciously perceiving movement illusions, and the link between electrophysiological and phenomenological correlates of self-attributed illusory movements.
Participants and methods: Hand illusory movements were induced in fifteen participants by applying vibratory stimulations to flexor tendons of the forearm. We recorded both self-report and electrophysiological (EEG) responses to the stimulation. EEG data have been further explored by source localization analyses.
Results: Data analysis highlighted that psychophysical features of the conscious experience of illusory movements are internally consistent. Further, while such experience is mediated by a broad frontal-parietal network, prefrontal medial structures seemed to play a primary role for its awareness and superior parietal structures seemed instead to play a crucial role in modulating its actual occurrence.
Conclusions: Vibratory stimulations are able to induce vivid movement illusions and to elicit the activation of a network involved also in real action execution. Together with the consistency of reported psychophysical correlates of conscious experience, that suggests that illusory movements have been coded, at least in part, as real actions and plausibly lead to ownership and self-attribution evaluation processes that may be mirrored by parietal information-integration mechanisms.
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The Veterans Aging Cohort Study (VACS) Index predicts neurocognitive impairment in people with HIV: Results from the Ontario HIV Treatment Network (OHTN) cohort study
Sean B. Rourke, Anita Rachlis, M. John Gill, Adriana Carvalhal, Colin Kovacs, Jason Brunetta, Gordon Arbess, Amy Justice, Janet Raboud, Thomas Marcotte, Tsegaye Bekele
Objective: We examined whether the VACS index predicts neurocognitive impairment (NCI) in people living with HIV.
Participants and methods: The sample included 1,055 OCS participants (mean age: 45 years; 77% male; 58% Caucasian) attending two HIV clinics in Toronto, Canada. A brief neuropsychological battery that included the WAIS-R Digit Symbol, WMS-III Spatial Span, Grooved Pegboard, and the Hopkins Verbal Learning Test - Revised was administered annually (2007-2014). Test scores were transformed in to demographically corrected T-scores. NCI was defined as Global Deficit Score of ≥ 0.5. VACS index score was computed by summing pre-assigned points for age, CD4, viral load, hemoglobin, platelets, AST, ALT, and HCV infection. Generalised Estimating Equations (GEE) were used to examine the association between the VACS index and NCI.
Results: VACS index score at first visit ranged from 0 to 111 (Median: 16; IQR: 6-27) and 55% had NCI. Participants with NCI had higher mean VACS index (20.0 versus 16.7; $p < 0.001$) and were more likely to be female or non-Caucasian and have higher depressive symptoms (CESD ≥16); low nadir CD4 (<200 cells /mm3); have diabetes; and be current smokers.
A 10-point increase in VACS index was associated with a relative risk

of NCI of 1.04 (95% CI: 1.02-1.06) after adjusting for demographics, HIV, and comorbidity variables. Higher cognitive symptoms, low nadir CD4 and diabetes were also associated with increased risk of NCI.
Conclusions: The VACS index predicts higher risk of neurocognitive impairment. Interventions that address comorbidities and underlying physiologic injury may improve neurocognitive function in HIV.
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Postoperative cognitive decline in elderly oncological patients: incidence and risk factors.
Eline Rotteveel, G.H. de Bock, B.L. van Leeuwen, J.M. Spikman
Objective: A substantial part of elderly patients undergoing oncological surgery are faced with adverse outcomes. One of these is postoperative decline in cognitive function. This study aims to determine the incidence of and to find possible predictors for cognitive decline 3 months postoperative in elderly oncological patients.
Participants and methods: Included were 247 patients (≥65 years old), undergoing surgery for the removal of a solid tumour. Cognitive performance was assessed pre-operative and 3 months postoperative, with the MMSE, RAVLT, TMT part A and B and the RFFT. Postoperative decline was defined as a decline of ≥ 2 SD on 1 test, or a decline of >1 SD on ≥ 2 tests. Raw test scores were standardized using the preoperative mean and standard deviation of the patient population. Combined Z-scores were calculated to create 3 domains: memory, executive function and attention. Multiple linear regression analysis was used to find possible risk factors for cognitive decline in these domains.
Results: Of the 216 patients that completed the assessment at baseline and 3 months postoperative, 11 (5.2%) developed postoperative cognitive decline 3 months postoperative. One (0.5%) had a decline in memory, 2 (0.9%) in executive functioning and 8 (3.8%) declined in two domains (executive/attention). Decline in memory and executive function were predicted by age and tumour site (memory: R^2=0.185, executive function: R^2= .045).
Conclusions: This study found a lower incidence of cognitive decline than expected based on previous literature. Elderly patients are more prone to have postoperative cognitive decline in executive functioning and memory.
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The Veterans Aging Cohort Study (VACS) index and neurocognitive change: A longitudinal study
Maria Marquine, Jessica Montoya, Anya Umlauf, Pariya Fazeli, Ben Gouaux, Robert Heaton, Ronald Ellis, Scott Letendre, David Moore
Objective: Combination antiretroviral therapy (ART) has transformed HIV-infection into a chronic disease with multiple interacting causes of morbidity and mortality. The Veterans Aging Cohort Study (VACS) Index was developed in this context, as a composite marker of disease severity among HIV-infected persons, and has been associated with concurrent risk for neurocognitive impairment (NCI). The present study examined whether the VACS Index predicts longitudinal neurocognitive change.
Participants and Methods: Participants included 655 HIV-infected persons who participated in cohort studies at the UCSD HIV Neurobehavioral Research Program (at baseline: Mean age=42.5; 83% male; 60% White; AIDS=67%; Median current CD4=346; on ART=61%; mean follow-up time=4 years). The VACS Index was calculated through standard methods. Participants completed a comprehensive neurocognitive battery. Neurocognitive status was plotted over time using demographically- and practice-adjusted global and domain T-scores. NCI was defined by global deficit scores derived from T-scores.
Results: In adjusted longitudinal analyses, higher VACS Index scores were significantly associated with worse global and domain neurocognitive performance (*p*s<0.01). Among a subgroup of participants who were neurocognitively normal at baseline (*n*=392), higher VACS Index scores were linked to increased risk for developing NCI (*HR*=1.16, *p*<0.001). We categorized VACS Index scores, and found that the upper quartile group was more likely to develop NCI than the lower quartile (*HR*=2.12, *p*=0.002) and middle groups (*HR*=1.72, *p*=0.005).
Conclusions: HIV-infected persons with high VACS Index scores are at increased risk for decline and incident NCI. The VACS Index shows promise as a tool for identifying HIV-infected persons at risk for NCI.
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Patterns of early neuropsychological and academic achievement in neurotypicals and young children with Williams syndrome
Jessica Reeve, Melanie Porter
Objective: The association between neuropsychological functions with early academic abilities is not well understood in neurotypicals or individuals with neurodevelopmental disorders. The primary objective was to investigate the relationship between neuropsychological functions and early literacy and numeracy abilities, both in neurotypicals and in young children with Williams syndrome (WS). In line with limited research on neurotypicals, we predicted an association between early academic abilities and general developmental levels, executive functioning and motor abilities, in both groups. Consistent with cognitive variability in WS, we expected variability in early academic skills in our WS cohort; we also expected numeracy to be poorer than literacy in WS
Participants and Methods: Parent report ratings and performance-based neuropsychological measures were collected on 24 children with WS (CA range = 2.2 to 7.7 years, *M* = 4.62, *SD* = 1.59) and 85 typically developing controls (CA range = 2.2 to 8.1 years, *M* = 4.68, *SD* = 1.65).
Results: As predicted, neuropsychological functioning was significantly correlated with academic skills in both WS and neurotypical children, however significant group differences also emerged. For example, verbal development related to early literacy in neurotypicals, but not WS, and executive functioning related to early numeracy in WS, but not neurotypicals. WS children displayed poorer numeracy than literacy in general and there was variability in academic ability levels.
Conclusion: This study identifies important neuropsychological correlations and provides an understanding of early academic development in both neurotypicals and young children with WS. Practical and clinical implications of these findings are discussed.
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Attentional-intentional deficits associated with end stage renal disease and dialysis are normalized with kidney transplantation
Michal Harciarek, Jaroslaw Michalowski, Bogdan Biedunkiewicz, John Williamson, Alicja Debska-Slizien˙ Boleslaw Rutkowski, Kenneth Heilman
Objectives: Patients with end-stage renal disease (ESRD) undergoing dialysis often have cognitive impairment, mainly psychomotor slowing as well as difficulties sustaining attention related to a deficient energization/activation of the anterior attentional-intentional system. Although there is evidence that a successful kidney transplant may improve cognitive function of dialyzed patients, the impact of a kidney transplant on the anterior attentional-intentional system has never been specifically investigated. Thus, the aim of this study was to test if a successful kidney transplant improves the anterior attentional-intentional system of dialyzed patients.
Participants and Methods: Twenty-three non-demented ESRD patients undergoing dialysis were compared with 24 non-demented demographically-matched patients with ESRD who received a kidney transplant, as well as 25 matched controls on the performance on four reaction time (RT) subtests from the ROtman-Baycrest Battery to Investigate Attention (ROBBIA). These included measures of Simple, Choice, and Prepare RTs along with a Concentrate task.
Results: Dialyzed patients were significantly slower than the two other groups on all tasks but the Prepare RT task with a warning signal presented 1 s before the onset of imperative stimulus. There was, however, no difference in RTs between patients who received kidney transplant and controls on any of the ROBBIA tasks.
Conclusions: The results of this study suggest that a successful kidney transplant improves the functions mediated by the anterior attentional-intentional system that is typically impaired in ESRD undergoing dialysis.
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Oral Presentation Session: Assessment - 09.00 - 10.30

Development and validation of the children's cognitive screening instrument
Lois Coy, Sana Khullar, Amy Gaunt, Declan Heaslewood, Stephanie Pegnall, George Goldie, Harriet Garfield, Alex Marsh, Ingram Wright
Objective: There is a need for a brief neurocognitive screening tool to detect cognitive impairment in children with neurological disorders. Current tools to examine cognitive dysfunction within paediatric populations are time consuming and require specialist skill to administer, which may delay identification of impairment and preclude appropriate specialist referrals. This study presents a new measure, the 'Children's Cognitive Screening Instrument' (CCoSI), alongside standardisation data. We examine the validity of which would detect potential cognitive impairment in the domains of attention, memory, language, fluency and visuospatial function that would warrant follow up by formal neuropsychology services.
Participants and Methods: Two versions of the CCoSI were developed to reduce floor and ceiling effects across age bands (5-11y; 12-16y). 240 typically developing children (Age Range 5-16 years) completed the CCoSI. normative scores were stratified by age to control for developmental variance and impairment cuttoff scores established. The CCoSI was administered to a sample of patients (n=16) with neurological disorder and their patterns of impairment as determined by the CCoSI were compared to the results of standardised neuropsychological tests (n=8) to examine specificity and sensitivity rates.
Results: Domain scale cut offs were determined at the 5th percentile with high sensitivity and specificity.
Conclusions: The CCoSI was able to successfully indicate patients requiring further assessment with good sensitivity and specificity within a limited clinical sample. This tool warrants further clinical validation to prove its utility in the early detection of cognitive impairment.
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Performance validity test performance and post-concussive symptom severity following uncomplicated mild traumatic brain injury in children and adolescents
Lisa Stanford, Erica Krapf, Dalin Pulsipher
Objective: Symptoms after mild traumatic brain injury (mTBI) are associated with a number of non-injury factors including premorbid attention and emotional issues and heightened sensitivity to symptoms. Identifying factors associated with higher subjective post-concussive symptoms (PCS) report may help define treatments. Two published reports with pediatric samples have shown that those who fail performance validity tests (PVTs) report more total PCS. The purpose of this study is to determine how PCS severity markers of frequency, intensity, and duration are also related to PVTs.
Participants and Methods: This sample consists of 210 consecutive referrals for neuropsychological evaluation following uncomplicated mTBI (mean age 15.23 years). All participants completed the Postconcussion Checklist, which assesses total PCS, and the Postconcussion Syndrome Checklist, which assesses severity markers.
Results: Thirty-six (17%) individuals failed the Medical Symptom Validity Test (MSVT). There were no significant differences between those who passed and failed the MSVT in terms of age, grade, sex, race/ethnicity, or maternal education (p's < 0.05). Individuals who failed the MSVT reported significantly more PCS (d = 0.49), as well as significantly higher frequency (d = 0.72), intensity (d = 0.61), and duration (d = 0.71) of symptoms.
Conclusions: Failure of PVTs not only provides neurocognitive test performance validity data but also calls into question symptom validity. The present study finds that not only are the total number of PCS related to failure of PVTs but also to the severity of symptoms. Practitioners should use caution in interpreting self-reported PCS if there is also PVT failure.
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Evaluating drawing strategy of the Rey Osterrieth Complex Figure (ROCF) and its unique contribution to assessing visual memory performance
Sarai Boelema, Carla Ruis, Martine van Zandvoort
Objective: For neuropsychologists, both quantitative and qualitative aspects of performance aid in understanding behaviour. However, assessing qualitative aspects in a standardized manner can be challenging. We propose and evaluate an assessement system to measure strategy (process) besides score (outcome) for the Rey Osterrieth Complex Figure (ROCF). Furthermore, we assess to which extent strategic competencies add relevance to understanding visual memory capacities above and beyond related factors.
Participants and methods: In a population cohort of healthy young adults (n=1569, M age = 19.1 years), ROCF direct copy and delayed recall (20 minutes) performance was assessed using the 36-point scoring system and a 7-point evaluation of strategy. First, strategies on copy and delayed recall were related to their respective performance scores. Next, regression analyses were conducted predicting delayed recall score (relative to direct copy score) from copy, controlling for (working) memory, strategic and visuospatial abilities, and demographic variables. Finally, cross sample validation was conducted using a neurological outpatient group (n=100) and patients with subarachnoid hemorrhage (n=80).
Results: In all samples, more efficient drawing strategies were related to higher scores, suggesting a close link between process and strategy, validating the scoring system. Furthermore, copy strategy significantly contributed to delayed recall performance, above and beyond the confounders (β=-.24), suggesting strategy provides additional information on visual memory functioning.
Conclusion: The current studies suggests that assessing drawing strategy is of added value in assessing performance on the ROCF. Using a standardised assessment system is a diagnostic tool to better understand incidental visual memory performance.
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Equal versus separate distributions of MMPI-2-RF validity scales relative to number of failed performance validity measures
Robert Stegman, Wesley Cole
Objective: There is a convergent body of scientific literature which establishes that only a few failed performance validity measures (PVMs) denote non-credible neurocognitive data. Less clear in the literature is the generalizability of failed PVMs.
Participants and Methods: The MMPI-2-RF validity scales of 233 consecutive comprehensive assessments were analyzed. All participants had sustained a medically documented traumatic brain injury and were assessed at the point when full recovery was expected. They were heterogeneous with regard to severity of injuries, interventions received to date, and reasons for referral to a neuropsychological assessment. Each was administered 8 to 10 established PVMs as part of assessment procedures as well as an MMPI-2-RF.
Results: Participants were grouped into one of six groups based on number of PVMs failed. Five or more failed PVMS did not differ substantively and were grouped into 5+. Exact n in each group: 0=34, 1=42, 2=37, 3=28, 4=18, 5+=69. Two-tailed t-tests comparing the 0 failed PVMs group to the other five groups across MMPI-2-RF validity scales were conducted. Effect sizes (Cohen's d) were calculated for each comparison. There are clear and unequivocal separate distributions of MMPI-2-RF validity scales. Separate distributions are apparent with 3 or more failed PVMs: Effect sizes range from 0.65 to 1.58 and all p values are ≤.01.
Conclusions: PVMs and MMPI-2-RF validity scales appear to be measuring the same dysfunctional mental sets. Data are consistent with the growing body of literature that the persistence of post concussive symptoms is a function of non-neurocognitive factors.
Correspondence: *Robert Stegman*, *NICoE, drstegman@hotmail.com*

Response bias is prevalent in neuropsychological assessment: A study of social security disability claimants in the Netherlands
Jos F. De Jonghe, Tjerk Schoemaker, Sascha Meyer, Dick Lam
Objective: Failing symptom validity tests (SVT) varies across different settings. While some studies examined underperformance in Dutch outpatient samples, we report on prevalence rates of underperformance in disability claimants.

Participants & Methods: This is a single site cross-sectional study using archival data from a convenience sample (n=224) of disability claimants in the Netherlands. The Green Word Memory Test (GWMT) was administered to all subjects. Data on the Amsterdam Short Term Memory Test (AKTG), the Structured Inventory of Malingered. Symptomatology (SIMS), the Beck Depression Inventory (BDI-II), and neuropsychological tests were available in subsamples.
Results: Average age of the participants was 46.3 years (SD 9.9), 41.5% were female, and 43% were higher educated. Relatively large proportions of cases presented with neurological (15.2%) or psychiatric symptoms (71.4%). GWMT was positive in 48.2% of all subjects. GWMT - AKTG agreement was high [Kappa = .71, p = .000], and GWMT - SIMS agreement was moderately high [Kappa = .42, p = .000]. Large differences were found between GWMT positive and negative cases on IQ testing [F(1, 144) = 40.6, p = .000], 15 Words test delayed recall [F(1, 118) = 13.8, p = .000], Stroop card III [F(1, 147) = 27.6, p = .000], and BDI-II [F(1, 124) = 11.5, p = .001].
Conclusions: This is one of few Dutch studies examining non credible test performance in disability claimants. Insufficient effort during neuropsychological examination was prevalent, and it was associated with poor outcome on regular cognitive tests and measures of depression.
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Impaired communication between the motor and somatosensory homunculus is associated with poor manual dexterity in autism spectrum disorder
Abigail Thompson, Declan Murphy, Flavio Dell'Acqua, Christine Ecker, Grainne McAlonan, Henrietta Howells, Simon Baron-Cohen, Meng-Chuan Lai, Michael Lombardo, MRC AIMS Consortium, Marco Catani
Objective: Fine motor skill impairments are common in Autism Spectrum Disorder (ASD), significantly impacting quality of life. Sensory inputs reaching the primary motor cortex (M1) from the somatosensory cortex (S1) are likely involved in fine motor skill, and specifically motor learning. However, the role of these connections has not been directly investigated in humans. This study aimed to investigate, for the first time, the role of the S1-M1 connections in healthy controls in vivo, and whether microstructural alterations are associated with motor impairment in ASD.
Participants and Methods: 60 neurotypical adult males aged 18-45, and 60 age- and sex-matched subjects with a diagnosis of ASD underwent fine motor skill assessment and scanning with diffusion tensor imaging (DTI). The S1-M1 connections of the hand region of the motor-sensory homunculus were dissected. The face/tongue region connections were used as a control.
Results: The ASD group displayed lower motor performances and altered DTI measurements of the hand-region S1-M1 connection. Behavioral performance correlated with hand-region DTI measures in both groups, but not with the face/tongue connections, indicating anatomical specificity. There was a left-hemisphere association of motor ability in the control group, and an atypical rightward shift in the ASD group.
Conclusions: These findings suggest that direct interaction between S1 and M1 is crucial for humans to precisely interact with and manipulate the environment. As electrophysiological evidence indicates that these connections may underpin long-term potentiation in M1, our findings may lead to novel therapeutic treatments for disorders of motor skill.
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Symposium Session: Neurorehabilitation in multiple sclerosis 11.00-12.00
Convenor: Nadina Lincoln
Chair and Discussant: Anita Rose
Speakers: Nadina Lincoln, Shona Logan-King, Sinead Hynes

Memory rehabilitation in multiple sclerosis: On the bumpy road to establishing evidence
Roshan Nair, Nadina Lincoln
Abstract: Memory problems are a common complaint in multiple sclerosis (MS). The 2014 NICE guideline on management of MS in primary and secondary care recommends that clinicians need to be aware that people with MS may not immediately be aware of their cognitive problems, but if these are found to be persistent, they should be referred to a neuropsychologist or occupational therapist for assessment and management. Neuropsychological rehabilitation has been found to be effective in reducing certain cognitive problems in some neurological conditions. However, the evidence for the effectiveness of such interventions for people with MS who have memory problems is equivocal. Where effectiveness has been established, this mainly tends to be on short-term impairment level measures that lack ecological validity, and not on long-term activity restrictions or participation (i.e., functional) outcomes. Therefore, it is perhaps not surprising that the latest NICE guideline, mentioned above, has the evaluation of clinical and cost-effectiveness of cognitive rehabilitation as a research priority.
In this presentation I will review the current evidence of memory rehabilitation in MS, by sharing results of our systematic reviews, randomised controlled trials, and qualitative studies related to memory rehabilitation. I will discuss some of the key issues with current studies (and evaluation of complex interventions in general), and offer some thoughts about future research directions for evaluating the effectiveness of memory rehabilitation in people with MS.

Evaluation of a First Line Model of Cognitive Rehabilitation for Individuals with Multiple Sclerosis
Shona Logan-King, Andrew Worthington
Objective: The study aim was to investigate the effect of a targeted, multifaceted and functional cognitive rehabilitation programme on objective and subjective measures of cognitive impairment, and quality of life, in people with Multiple Sclerosis (MS).
Participants and Methods: Twenty seven people with MS and self reported cognitive impairment were recruited, and randomly assigned to the intervention group, or a waitlist control group. Assessments were carried out with all participants at study entry and after 8 weeks. The intervention comprised of eight 1-1 weekly sessions focusing on memory, attention and information processing, as well as fatigue and anxiety management. Evidence based recommendations and approaches from the field of brain injury underpinned the session content. Accompanying cognitive rehabilitation manuals formed the basis for each session. Sessions were conducted by assistant psychologists/research assistants trained in this manualised approach, overseen by a neuropsychologist.
Results: Participants in the intervention group showed statistically significant improvement in both global and domain specific areas of subjective cognitive impairment following the intervention. The intervention group showed greater gains than the control group in relation to objectively measured cognitive impairment, and quality of life scores, but these results were not statistically significant.
Conclusions: With further study, the intervention has the potential to provide a framework for a first line cognitive rehabilitation intervention with people living with MS.

Tackling Cognition through Doing: a Cognitive Occupation-Based programme for people with Multiple Sclerosis (COB-MS)
Sinead Hynes, S Forwell
Objective: Despite the high prevalence and its consequences on function, there are few treatment options that address the cognitive difficulties that result from multiple sclerosis (MS) and coping with subsequent challenges of everyday life demands. We have developed the Cognitive Occupation Based program for MS (COB-MS), an eight session, evidence-based intervention that uses individual and group format, to address the problems encountered.
Method: A preliminary version of the COB-MS was developed based on published evidence and clinical expertise. This was followed by a detailed consultation process with two stakeholder groups, people with MS and occupational therapists, through focus groups and interviews. The programme and related materials were presented, and contributions recorded, transcribed and thematically analysed. Based on the consultation process the COB-MS was revised.
Results: The focus of the COB-MS is on managing daily life, employment and community engagement using routines, compensatory strategies, and streaming demands. Both stakeholder groups agreed that the COB-MS is relevant to the difficulties they experience and an intervention that addresses this is overdue.
Conclusion: The COB-MS is the first known cognitive intervention using an occupation frame of reference to address the functional

difficulties faced among persons with MS resulting from cognitive difficulties. It is well received by stakeholder groups and will be tested further.

Symposium Session: Practice and research insights from a culturally diverse developing country with wider cross-cultural relevance
11.00-12.00
Convenor: Ann Shuttleworth-Edwards
Discussant: Ann Watts
Speakers: Ann Watts, Ann Shuttleworth-Edwards, Sharon Truter

The Development of Neuropsychology in South Africa: The Long Road to Promulgation of a Specialist Register
Ann Watts, Ann Shuttleworth-Edwards
Objective: The aim of this presentation is to outline the professional development of neuropsychology in South Africa.
Method: Information was obtained through literature searches, personal communication, and the authors' professional involvement in South African neuropsychology.
Results: The early roots of neuropsychology in South Africa were researched based, dating back to the 1950's. The discipline became more practitioner oriented in the late 1970s and early 1980s, with national neuropsychology conferences, international liaison, and the creation of the South African Clinical Neuropsychological Society (SACNA), a credentialing and training body. The advancement of neuropsychological practice in South Africa has faced numerous challenges, against a background of extreme socio-cultural and socio-economic disparity in the country that is on-going. Although applied for in the 1980s, there has never been a neuropsychology category within the South African professional framework. The number of practitioners in neuropsychology is sparse, including mainly masters, and some doctoral level psychologists registered in clinical, counselling or educational categories. The absence of specialist registration has impeded the development of high level training programmes in university settings. However, South Africa is currently on the cusp of achieving a hard-won neuropsychology category, a development that is likely to boost the discipline, including the development of training programmes of international standing, the creation of neuropsychology posts, and wider service delivery.
Conclusions: Despite significant challenges in a culturally diverse developing country, South African neuropsychology has evolved sufficiently to warrant the creation of a separate category, with the promise of substantive training opportunities and health benefits.

IQ Test Norming Challenges in the Culturally Diverse South African Context with Insights of International Relevance
Ann Shuttleworth-Edwards, Ida Pienaar, Sarah Radloff
Objective: The objective of this paper is to address the issue of culturally fair IQ testing within a multicultural context, with a focus on methodological approaches to norming. Burgeoning cultural diversity worldwide calls for an evaluation of adequate assessment practices.
Method: Critical discussion is provided covering (i) test-taking bias that may result in invalid placement and diagnostic decisions in diverse cultural settings; and (ii) methodological underpinnings of population-based norms versus demographically focused within-group norms. The following illustrative material is supplied: (i) a delineation of the South African WAIS-III and the WAIS-IV population-based standardizations, and (ii) the presentation of South African WAIS-III and WAIS-IV within-group normative data.
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 the quality of education received for the African first language individuals that make up the samples. The within-group norming data for African first language individuals reveal substantive differences in test results of up to 25 IQ points in association with disadvantaged versus advantaged quality of education.
Conclusions: 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 diverse cultural contexts, not only in South Africa, but in any setting where there is extreme socio-cultural and socio-economic diversity. The use of finely stratified within-group norms is preferred, serving to reveal rather than obscure cross-cultural disparity in cognitive test performance.

A Collation of South African Norming Indications on Commonly Employed Cognitive Tests in Comparison with Other Norming Data
Sharon Truter, Ann Shuttleworth-Edwards, Sarah Radloff
Objective: The aim of this paper is to present a collation of South African normative indications for individuals from educationally disadvantaged backgrounds in comparison with age-related norms in the literature.
Participants and Method: Participants were a nonclinical sample of 33 Xhosa speaking individuals (21 female, 12 male) from the Eastern Cape in South Africa with 11 or 12 years of education received in an educationally disadvantaged township school, stratified for ages18 - 29 and 30 - 40 years. A selection of tests was administered in English by clinical masters students, in standard format and designated order including tests of: Executive function (Trail Making Test, Stroop); Verbal and Visual Memory (Wechsler Memory Scale Associate Learning, Visual Reproduction); Hand Motor Function (Finger Tapping, Purdue Pegboard); Verbal Fluency ('s' words, words in one minute); Visuoperceptual Function (Rey-Osterreith Complex Figure); Malingering (Rey 15 Item, Tomm, Reliable Digit Span). A literature search identified additional norming data for comparative purposes.
Results: Results indicated lowered scores in all instances for the South African data sets compared with norms on English first language westernized populations, with some similar lowering identified on studies for other foreign, relatively non-westernized populations. Generally, scores did not reveal a floor effect.
Conclusions: Extreme caution must be applied in the application of tests developed on westernized populations with socio-culturally and socio-economically disadvantaged individuals relative to that standard. However, the absence of a floor effect suggests that these commonly employed tests do have clinical applicability for the targeted population when used with relevant local norms.

Wednesday 6th July 2016 Parallel Session B: 13.00-14.30

Invited DoN Symposium Session: Executive functions Theory, Assessment and Rehabilitation
13.00-14.30
Convenor: Jonathan Evans
Speakers: Iroise Dumontheil, Tom Manly, Paul Burgess, Brian O'Neill

Social cognition and executive functions development during adolescence
Iroise Dumontheil
Abstract: The prefrontal cortex, in coordination with more posterior brain regions, supports two aspects of higher cognition: social cognition and executive functions. Social cognition enables us to interact with other individuals, while executive functions coordinate our thoughts and behaviours to achieve goals. The social brain tends to show decreased activity during non-social forms of demanding executive functions tasks, and the two networks are typically studied in distinct strands of research, for example with paradigms assessing visuospatial reasoning skills or requiring explicit thinking about other people's mental states (theory of mind or mentalising). However, everyday life requires the manipulation and use of social information in combination with executive functions processes of goals management and action selection. Large scale longitudinal studies of brain structural development have demonstrated prolonged and region-specific trajectories of grey and white matter development, with significant changes occurring during adolescence and until early adulthood. However, it is still unclear how these structural changes relate to functional and behavioural changes during childhood and adolescence. In this talk I will present work that shows prolonged development of various aspects of executive functions and social cognition during adolescence, with associated changes in prefrontal cortex functioning. I will also discuss the interplay between social cognition and executive functions during development and investigate what is special in the manipulation of social information.

The Test of Everyday Attention for Children II (TEA-Ch2)
Tom Manly
Abstract: The Test of Everyday Attention for Children (TEA-Ch) was published in the 1990s and has become a widely translated measure of attention and executive function in children. Here I describe the development of the TEA-Ch2 (release 2016) with complete revision of all subtests. Among the most significant changes are an extension of the age-range to 5-year-olds and the introduction of computerized subtests to facilitate administration, reaction time measurement and automated scoring. There are now two batteries; one simplified and shortened for children from 5-7 and the other for children from 8+. I will outline the new tests and present insights from the 1300 children from the normative sample and illustrative case-studies.

fNIRS: Prefrontal activation during social vs. non-social intentions in a naturalistic setting
Paul W. Burgess, Clarisse Aichelburg, Paola Pinti, Frida Lind, Sarah Power, Elizabeth Swingler, Arcangelo Merla, Sam Gilbert, Ilias Tachtsidis, Antonia Hamilton
Abstract: Delayed intentions with a pro-social aspect have a special status for humans. We also know that prefrontal cortex, especially area 10, plays a critical role in creating and maintaining delayed intentions. However, it is difficult to investigate the neural substrates of social intentions in a typical neuroimaging environment since the participant is separated from other people, and there are constraints on voluntary movement which alter the ways people behave. So we used wireless fNIRS to contrast prefrontal cortex activations during the maintenance and execution of intentions relating to pro-social vs. non-social cues in a naturalistic environment. The experiment was conducted outside, on a typical London street, with participants free to move and act as they would normally.
17 participants undertook a prospective memory (PM) task involving remembering to carry out intended actions after a delay period filled with ongoing tasks. There were 2 prospective memory conditions: social and non-social. Prefrontal cortex activity was monitored using a 16-channel Wearable Optical Topography fNIRS system.
Relative to walking and observing the environment, when participants were also maintaining a delayed intention, there was significantly increased HbO2 with corresponding HHb change in a wide number of medial and lateral PFC regions. There were more specific medial rostral PFC changes (HbO2 increase; HHb decrease) relative to the ongoing task only. Most critically however, the social cues condition saw a significant increase in HbO2 (with significant decrease in HHb) in lateral prefrontal cortex regions. These results suggest that the advantage for pro-social delayed intentions is reflected in differences in activation within prefrontal cortex, which can be detected even in naturalistic settings. The technology opens up many new possibilities for studying brain function in situ in the rehabilitation setting.

Assistive technology in the rehabilitation of executive dysfunction
Brian O'Neill
Abstract: Executive function deficits are common consequences of acquired brain injury, mediating difficulties with independent activity and social participation. Executive function impairments are difficult to rehabilitate, and often require significant social support for supervision and prompting.
Assistive technology for cognition offers effective compensation for such deficits, offering potential reductions in care costs and increased autonomy of survivors. The most robust current evidence is for the utility of reminder devices and micro-prompting devices. Reminder devices provide time-dependent prompts to action. Micro-prompting devices sequence the actions necessary to perform a task.
Guide is a micro-prompting technology which builds on users' intact abilities by emulating naturalistic conversational support for task performance. Scaffolding, verbal guidance to enable task performance that could not be achieved unassisted, is thought to be key in the development of executive control abilities, and its extension to neuropsychological rehabilitation is useful. By equipping Guide with expert activity protocols, the task support offered can cope with problems occurring and can be internalized.
Data will be presented from several studies recruiting a. neurotypical samples, b. persons with vascular dementia and c. persons with acquired brain injury. These studies together demonstrate reduced errors and when using the micro-prompting system and reduction in need for carer prompting.
The potential of micro-prompting technologies to be more context-aware, by using sensors to gain insight into environmental or user state, increases their potential applicability. Ideas for the future use of prompting technologies in the rehabilitation of executive function will be examined.

Symposium Session: Numerical skills - assessment and intervention – 13.00-14.30
Convenor: Margarete Delazer
Discussant: Brian Butterworth
Speakers: Marie-Theres Pertl, Marinella Cappelletti, Girgio Arcara, Silvia Benavides-Varela

Numerical training improves decision making under risk
Marie-Theres Pertl, Margarete Delazer, Thomas Berger, Thomas Benke, Gabriel Bsteh, Rainer Ehling, Susanne Glatzl, Johanna Wenter, Christian Brenneis, Laura Zamarian
Objective: Aim of our study was to investigate whether a targeted training program would improve understanding of ratio concepts and performance in decision making in patients with multiple sclerosis (MS) and healthy controls (HC). We were also interested in possible group differences.
Participants and Methods: In a controlled cross-over design, patients with MS and HC underwent five consecutive training sessions on symbolic ratio processing and five training sessions on text comprehension. Before starting the training, they performed a comprehensive neuropsychological test battery assessing executive functions, decision making under risk and different numerical competences (T1). Both the decision-making task and parallel forms of the ratio processing tasks were again administered after each training (T2 and T3).
Results: Mixed ANOVAs indicated significant and stable effects of training (T1< T2=T3) both in decision making and in ratio processing. The effect of group was only significant in a task with ratio concepts, with patients scoring overall lower than controls. The interaction between group and session was not significant in any analyses.
Conclusion: We find for both groups significant performance improvements in decision making and ratio processing following a targeted cognitive training with both trainings having an effect. Results of this study suggest that targeted cognitive training may help people to better understand ratio concepts and to make more advantageous decisions under risk. Acknowledgement: MUI-Start 2014-05-001.

Quantity abilities in the healthy and pathological brain
Marinella Cappelletti, Ana Maria Rivas Grajales, Vyacheslav Karolis
A dominant view in numerical cognition is that quantity processing is an innate, automatic, cross-species parietal lobe-based domain. The extent to which such domain is vulnerable to brain lesions, to age-related decline and whether it may be malleable enough to allow improvements in performance are yet unexplored issues.
Here we will present data from neuropsychology, neuroimaging and experimental psychology indicating that quantity processing can be (1) selectively spared even in the context of parietal lesions, (2) maintained in healthy ageing, possibly because parietal lobes age later than other areas, and (3) boosted when properly trained even in ageing.
Aims: To study the extent to which quantity processing may be spared in neuropsychological patients, may be vulnerable to age-related decline and can be boosted with training.
Methods: Neuropsychology in patients with neurological lesions, neuroimaging and training in healthy ageing participants.
Results: Neuropsychological patients with lesions also involving the parietal areas showed relative maintenance of quantity abilities. Structural imaging and behavioural data comparing young with healthy ageing participants, suggest that these abilities are resistant to ageing, possibly because numeracy is supported by a network of brain regions that tend to age less compared to other brain regions. Finally, a training study coupled with brain stimulation showed that some basic numerical abilities can be significantly boosted even in healthy ageing.

Conclusions: Overall these data suggest that quantity processing can be spared in neuropsychological patients, is less vulnerable to age-related decline, and can be boosted with appropriate training.

A novel tool to assess financial abilities in clinical populations: the NADL-F
Girgio Arcara, Francesca Burgio, Silvia Benavides-Varela, Toffano Roberta, Meneghello Francesca
Objectives: Even if the general loss of financial capacities has important consequences for the patient (Pinsker, 2010), there are only a few instruments in literature designed to assess financial abilities (Marson & Zebley, 2001). The present study aims at providing the psychometric properties, validity, and normative data of a new tool to assess the financial capacity in clinical populations, the Numerical Activities of Daily Living -Financial (NADL-Financial).
Participants and methods: The NADL-F consists of 7 subtests tapping on different domains of Financial Capacity (Counting Currencies, Written Abilities, Item Purchase, Percentages, Financial Concepts, Bills, and Financial Judgments). It was administer to a sample of 119 healthy participants (Mean age = 69.45 years, SD = 8.40; mean education = 12.2 years, SD = 4.80), along with several neuropsychological tests.
Results: The NADL-F showed satisfying internal consistency (all Cronbach's alpha ≥ 0.60) and excellent Inter-rater reliability (all coefficients ≥ 0.93). Moreover, NADL-F correlated positively with education, performance based neuropsychological tests, CRI-q, and IADL; and negatively with age and GDS score supporting the construct validity of NADL-F.
Conclusions: The results showed that NADL-F has satisfying internal consistency and good construct validity. It should be a useful instrument to be added in the toolkit of the neuropsychologist, able to provide a reliable measure of Financial Ability of an individual for clinical or legal purposes. Results on NADL-F could also be the starting point for an oriented rehabilitation protocol targeting financial capacities.

Identifying spatial and non-spatial numerical deficits in right-hemisphere acalculia
Silvia Benavides-Varela, Daniele Piva, Francesca Burgio, Laura Passarini, Giuseppe Rolma, Francesca Meneghello, Carlo Semenza
Objectives: While there is increasing evidence for the crucial role of the right hemisphere in numerical tasks, the exact relationship between spatial and calculation disorders remains poorly understood. The present study aims at exploring this issue by means of the Numerical Activities of Daily Living (NADL) (Semenza et al., 2014), which besides testing numerical skills assesses the impact of the numerical disorders on patients' everyday life.
Participants and methods: The study included 30 right brain damaged patients and 35 healthy controls that completed the NADL along with a comprehensive neuropsychological assessment and MR scans.
Results: We found that patients and controls significantly differ in number comprehension, written operations, transcoding, general knowledge of numerical facts in everyday life, time estimation, and Money usage. Additionally, prototypical neglect errors (omissions and intrusions) were highly frequent among patients in number comprehension tasks. Measures of Neglect predicted the patient's performance in Number Comprehension tasks [dot counting, number comparison] but failed to predict calculations abilities. The latter were best predicted by representational visuo-spatial abilities and appeared affected by lesions in core regions of the numerical system, namely the proximity to the right angular gyrus. Remarkably, Non-spatial errors outnumbered spatial ones in written calculation tasks.
Conclusions: These findings suggest that, although highly common, Neglect deficits in right-hemisphere damaged patients might not be the most crucial or single cause of right-hemisphere acalculia. Moreover the results evidence that numerical deficits in people with right-hemisphere lesions also impact their ability to carry out numerical activities of daily living.

Symposium Session: Symptom validity: the blurred lines between crooks and genuine patients
13.00-14.30
Convenor and Discussant: Rudolf Ponds
Speakers: Jos de Jonghe, Jeroen Roor, Isabella Niesten, Brechje Dandachi-FitzGerald, Harald Merckelback

Symptom validity testing (SVT) and social security disability claims
Jos de Jonghe
Objective: Over 50% of adult disability claimants fail some form of SVT. While some over report psychological, affective symptoms, others may report incredible cognitive symptoms. We examined effects of different types of response bias on free recall and self-reported depression.
Participants & Methods: This is a single site cross-sectional study using a convenience sample (n=224) of disability claimants in the Netherlands. The Green Word Memory Test (GWMT) was administered to all subjects. The Amsterdam Short Term Memory Test (AKTG), the Structured Inventory of Malingered. Symptomatology (SIMS), and the Beck Depression Inventory (BDI-II) were administered in subsamples. Participant classification according to GWMT (G) and SIMS (S) outcomes resulted in four groups, G+/S+, G+/S-, G-/S+ and G-/S-.
Results: Average age of the participants was 46.3 years (SD 9.9), 41.5% were female, and 43% were higher educated. GWMT was positive in 48.2% of all subjects, and 27.6% scored positive on both GWMT and SIMS. Analysis of variance of GWMT Free recall and Beck depression scores showed significant group differences [$F(3, 123) = 33.21$, $p = .000$] and [$F(3, 106) = 25.17$, $p = .000$] respectively.
Conclusions: Non-credible test performance was prevalent in this Dutch study of disability claimants. Insufficient effort and over reporting of psychological symptoms are associated with different score profiles on regular tests and self-rating scales.

The effect of feedback on invalid performance on a symptom validity test and subsequent neuropsychological test administration
Jeroen Roor, Hans Knoop, Maarten Peters, Brechje Dandachi-FitzGerald, Rudolf Ponds
Objective: Little research and knowledge exists on how to proceed when a patient produces invalid neuropsychological test results. In this study, we examined the effect of providing feedback on invalid performance on subsequent neuropsychological test administration.
Participants & Methods: Data were drawn from an existing database consisting of adult patients with Chronic Fatigue Syndrome (CFS) of the Expert Centre for Chronic Fatigue of the Radboud University Medical Centre. The patients underwent neuropsychological assessment for clinical (i.e., non-litigating/non-forensic) purposes. 135 CFS patients scoring in the invalid range on a performance validity test (PVT) were included in this study. A subset was provided with feedback specifically addressing invalid performance. We compared this intervention group with patients that were not given this feedback. All patients underwent re-administration of the PVT and standard neuropsychological measures.
Results: The main findings of our study are that (1) providing patients with feedback on invalid performance resulted in improved PVT scores; and (2) this effect generalized to standard neuropsychological measures. Specifically, more than half of the patients that were given feedback on invalid performance scored in the valid range on a re-administered PVT. Of interest, this effect was also observed in roughly one third of the patients that were not provided with feedback.
Conclusion: Although this is a retrospective study where the two groups were not randomly assigned to one of the two conditions (i.e., feedback or no-feedback), it provides with empirical data on the effect on addressing invalid performance.

Using Moral Reminders to Deter Feigning in Treatment-Seeking Individuals: Some Issues to Tackle
Isabella Niesten, Harald Merckelbach, Brechje Dandachi-FitzGerald, Marko Jelicic
Presenting healthy individuals with moral reminders induces cognitive dissonance, which fosters moral behavior (i.e., evidenced by less cheating/lying). Yet, is it also a fruitful deterrence strategy for

feigning? We addressed this question in two ways. In Study 1, we presented treatment-seeking individuals (n = 29) with moral primes using the Mother Teresa Questionnaire and compared their scores on an index of symptom over-reporting (i.e., the Structured Inventory of Malingered Symptomatology; SIMS) with those of patient controls (i.e., no prime; n = 31). Moral primes slightly decreased SIMS scores, but the effect was not significant. In Study 2, we took a different approach to activate moral categories: we recruited 41 treatment-seeking individuals and asked half of them to sign a moral contract stating that they would answer the tests in an honest way. Next, we had them complete the SIMS and standard clinical scales measuring self-reported psychopathology. Again, we found no convincing evidence that moral cues suppress symptom over-reporting. Although our findings may seem discouraging, we argue that they do not necessarily refute the use of moral reminders in a clinical context. Instead, they underscore the importance of studying contextual and individual factors that affect moral decision-making in patients (e.g., attentiveness, contextual ambiguity, and dissonance susceptibility), and that may be amended to discourage feigning. In this presentation, we discuss our findings – as well as previous findings regarding feigning interventions – in light of such factors, and elaborate on implications for research and clinical practice.

Neuropsychologists' Ability to Predict Distorted Symptom Presentations
Brechje Dandachi-FitzGerald, Harald Merckelbach, Rudolf Ponds
Objective: For many European neuropsychologists the inclusion of symptom validity tests (SVTs) is not the default (Dandachi-FitzGerald et al., 2013. Symptom validity and neuropsychological assessment: A survey of practices and beliefs of neuropsychologists in six European countries. Arch. of Clinical Neuropsychology, 28, 771–783). This implies that neuropsychologists will be regularly confronted with the question of whether or not to add SVTs to their test battery. However, can neuropsychologists reliably predict on the basis of their clinical impression when SVTs have incremental value? Our study addressed this issue. Thus, we explored to what extent experienced neuropsychologists can predict distorted symptom presentation of hospital outpatients on Symptom Validity Tests (SVTs).
Method: Using clinical files and interview results, 31 neuropsychologists made predictions as to how 203 patients would perform on two SVTs. Their predictions were matched against actual passing or failing two SVTs, of which one measured symptom over-reporting and the other cognitive underperformance.
Results: Clinical prediction and SVT outcome agreed in 76% of the cases and disagreed in almost a quarter. Of the 152 patients for whom neuropsychologists had predicted non-distorted symptom presentations, 14 patients (9.2%) failed both SVTs. Of the 51 patients for whom neuropsychologists had predicted at least somewhat distorted symptom presentation, 35 patients (68.6%) passed both SVTs.
Conclusions: Clinical prediction of distorted symptom presentation is far from perfect. Our findings show that SVT's – whether they indicate distorted or non-distorted symptom presentation – have incremental value in that they may correct initial clinical judgment.

The intimate link between symptom exaggeration and antisocial traits: It's a myth
Harald Merckelback
Abstract: According to the DSM-5, antisocial traits are a red flag for intentional symptom exaggeration (i.e., malingering). Thus, the DSM-5 description of symptom exaggeration really comes down to the stereotype of the antisocial individual who is involved in litigation or a criminal procedure and who fabricates symptoms so as to obtain benefits of all sorts.
In this presentation, we discuss why this stereotype is dead wrong. First, empirical studies in this domain have found at best weak evidence for a connection between symptom exaggeration and antisocial traits. Symptom exaggeration is more dependent on situational factors than on stable traits. Second, there is the more fundamental issue that the alleged link between antisocial traits and symptom exaggeration cannot be falsified: whenever the data show no correlation (which is often the case), one could argue that antisocial individuals are clever malingerers whose exaggeration is so sophisticated that it goes undetected. Third, the myth of the antisocial malingerer fosters a selective use of symptom validity tests (SVTs). Thus, the DSM-5 encourages their administration in antisocial samples (but not other types of samples), which may create illusory correlations. Fourth, and final, the DSM-5 stereotype is so entrenched in the minds of clinicians that when they are confronted with a patient who vaguely meets the DSM-5 stereotype, but who otherwise performs in the normal range on SVTs, clinicians will nevertheless conclude that this patient is engaging in symptom exaggeration.

Oral Presentation Session: Speech and Language
13.00-14.30

Types of developmental dyslexia and their distribution in Hebrew
Naama Friedmann, Lilach Khentov-Kraus
Objective: Different types of dyslexia result from impairments in different loci in the word reading process. Each type of dyslexia has different characteristics, according to the impaired component, showing errors in different kinds of stimuli. Whereas types of acquired dyslexia have been identified and reported in many studies, types of developmental dyslexia are less known.
Participants and Methods: In this study we examined the existence and the distribution of the various types of developmental dyslexia in 465 Hebrew readers with dyslexia (in comparison to 464 readers without dyslexia). To detect each type of dyslexia, we created tests with stimuli sensitive to all dyslexia types, including migratable words for letter position dyslexia, irregular and potentiophonic words for surface dyslexia, morphologically complex words and nonwords for phonological output buffer dyslexia and deep dyslexia, migratable word pairs for attentional dyslexia, etc. In order to identify the exact deficit of each dyslexic participant, we conducted a line of various reading tasks, including reading aloud, lexical decision, and word comprehension, each aimed to test a different component in the reading process.
Results: This research identified 15 types of developmental dyslexia.
Conclusions: There existed surface-dyslexia (of four subtypes), vowel letter dyslexia, letter position dyslexia, and attentional-dyslexia are the most frequent reading impairments in Hebrew. Phonological-output-buffer-dyslexia, visual dyslexia, neglect-dyslexia, Dyzlegzia, phonological(conversion) dyslexia, letter agnosia, and deep-dyslexia also exist in Hebrew-speaking developmental-dyslexics, but are less frequent.
Correspondence*: Naama Friedmann ,Tel Aviv University, naamafr@post.tau.ac.il*

New word acquisition with a phonological loop deficit - A fast mapping Approach
Damien Appleton, Rosaleen McCarthy
Objective: It has been argued that the purpose of the phonological-loop (P-L) in day-to-day functioning is to help learn new words (Baddeley, Gathercole & Pagano,1998). Vallar and Baddeley (1984) described a patient P.V. who had an impaired phonological loop and was unable to acquire novel words using paired-associate learning. We wished to establish whether new words could be learned by a patient with a PL deficit using Fast-Mapping (F-M), (Carey and Bartlett, 1978). F-M provides a more ecologically valid approach to acquiring new phonological forms and meaning associations.
Methods and Participants: J.T. 53 year old man diagnosed with a Grade 2 left temporal-insular astrocytoma and subsequently treated by radiotherapy. Neuropsychological testing indicated that J.T. had a specific deficit within his PL, as characterised by poor auditory-verbal digit span, and impaired token test performance. However, his ability to learn and recall spoken list and story material was within the normal range. J.T. was tested on a F-M task modified from Sharon, Moscovitch, and Gilboa (2011). A second F-M task was developed with a new set of stimulus items from Gupta et al.'s (2004) alien pictures and non-words.
Results: J.T.'s performance was equal to age and education matched controls on both F-M tasks.
Conclusions: The results corroborated JT's personal report of foreign vocabulary acquisition whilst on holiday. Results suggest that the PL is not essential for phonological word-form acquisition but that it may have a role as a backup resource when first pass attempts at comprehension fail (McCarthy and Warrington, 1987).
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What was that again? Short-term retention in children with LI
Marja Laasonen, Emmanuel Pothos, Todd Bailey, Iida Porokuokka, Sini Smolander, Eva Arkkila, Heikki Lyytinen, Elisabet Service
Objective: Etiological factors leading to language impairment (LI) are not well-understood and may include nonverbal factors. Examples of such nonlinguistic candidates that have been put forward are attention, general processing speed, and short-term (STM) or working memory. In the Helsinki longitudinal SLI study (tiny.cc/helSLI), we investigated 250 3-6-year-old children with LI and 160 typically developing peers. HelSLI-cognitive concentrates on nonlinguistic correlates of LI. Here we present results from nonverbal STM in 6 experimental tasks with temporal sequences in two modalities.
Participants and Methods:125 children with LI and 37 age- and Performance IQ-matched typically developing peers were assessed with tablet games targeting nonverbal visual and auditory STM for binary sequences (two simple tasks). In addition, temporally grouped and embedded sequences were tested (four manipulated tasks).
Results: On average, children with LI matched about 5, 5 and 8 binary, embedded and grouped items, respectively. Controls matched 6, 6 and 9. Mixed ANOVA identified a significant main effect of LI status on the number of matched items, along with differences between tasks and multiple interactions.
Conclusions: Overall, children with LI had poorer STM than the controls in the nonverbal temporal sequence tasks. Temporally grouping the items helped all children but those with LI benefited more compared to the simple binary task that was especially difficult for them. These results confirm that the difficulties related to LI are not restricted to verbal skills. In order to reveal possible causality, we will follow developmental trajectories of language development in relation to STM performance.
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Neuroanatomy of semantic and phonemic verbal fluency
Stephanie Forkel, Marco Catani, Flavio Dell'Acqua
Objective: Language models have recently broadened to include regions outside the classical Broca's and Wernicke's regions. In particular content information (semantics) is proposed to be processed along a ventral route via a temporo-frontal passage and grammatical and sound information (lexicon, phonology) is propagated along a dorsal route passing via parieto-frontal networks. We investigated the anatomy of semantic/phonemic verbal fluency using voxel-based lesion symptom mapping and diffusion imaging tractography in acute stroke patients.
Participants and Methods: 16 right-handed subjects (10 males; age 60±17 years; range 28-87 years) were assessed within 2 weeks of onset using the WAB-R and tractography (64 directions, b=1500, 7 Bo). The WAB-R provides an objective measure of semantic fluency. Additionally, lexical-phonemic fluency was obtained with the FAS test. Voxel-based lesion symptom mapping was used to identify regions associated with impairments in fluency. These regions were compared to tractography results.
Results: The results indicated that white matter lesions in a region in the posterior frontal and external-extreme capsule were predictors for both phonemic and semantic fluency impairments. However, lesions extending more dorsally in the white matter of the posterior frontal lobe were critical only for phonemic fluency impairments. Tractography results indicate the involvement of the uncinate fasciculus, the inferior fronto-occipital fasciculus, and the anterior and long segment of the arcuate fasciculus for both phonemic and semantic fluency impairments. Lesions to the frontal aslant tract were predominantly associated with phonemic fluency impairment.
Conclusions: Our results suggest that phonemic and semantic fluency depends on largely overlapping networks. The frontal aslant tract is specifically involved in phonemic fluency.
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Effects of standard versus speeded priming on lexical access in picture naming and connected speech in older adults
Christina Sotiropoulou, Paul Conroy, Matthew Lambon Ralph
Objective: Healthy older adults frequently report experiencing greater word finding difficulties (WFD), compared to younger adults. Research on older adults' WFD has traditionally focused on production of single words when completing picture naming tasks, while very little is known about how much these WFD can compromise connected speech.
Participants and Methods: This study aimed to compare a standard priming method ('single presentation'- SP) against a method encouraging increasingly speeded production across repetitions ('repeated increasingly speeded presentation' - RISP) in terms of which would be more efficient in speeding-up participants, and what method would lead to more efficient use of primed words in connected speech. SP was applied to half the stimuli (n=40) and RISP to the other half of stimuli (n=40) in 21 healthy older adults. After completion of these tasks, participants were asked to complete composite picture description tasks (n=4), where the composite pictures included the primed items.
Results: Compared to SP, RISP was found to be significantly more effective in dramatically reducing picture naming latencies without inducing a speed-accuracy trade-off and with lasting effects. However, a reduction of naming speed was not critical for retrieving words in connected speech, in that SP was as effective in promoting retrieval in connected speech as RISP.
Conclusions: The findings strongly suggest that single-word primes are central to the selection of words for production in aging population's connected speech. They also highlight the critical role of speed of word retrieval and potentially provide methods for tackling WFD in clinical populations, such as stroke aphasia.
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Wednesday 6th July 2016 Parallel Session C: 15.00 - 16.30

Invited BNS Symposium Session: Memory and dementia: Cognitive neuroscience and clinical practice 15.00-16.30
Chair: Julie S Snowden
Speakers: Chris Bird, Michaela Dewar, Sebastian Crutch, Paul Hoffman

Memory for events in healthy adults and adults with very early-stage Alzheimer's disease.
Chris Bird
Abstract: The formation of durable memories involves mechanisms of consolidation whereby memory traces are made resistant to forgetting. We investigated memory consolidation for lifelike events by asking people to watch and rehearse short video clips during MRI scanning. In healthy adults, memory rehearsal reinstated patterns of activity in a network of brain regions associated with episodic memory. Moreover, the strength of reinstatement correlated with recall of the videos a week after they were watched. This suggests that re-instantiation of neural activity within a network of brain regions supports the consolidation of detailed lifelike events. We are carrying out a similar study in adults with mild cognitive impairment and Alzheimer's disease to investigate the breakdown of episodic memory in these conditions.

Rest and remember - novel insights into memory consolidation in amnesic patients
Michaela Dewar
Abstract: New memories are fragile and need to strengthen over time so that we can remember them at a later point. This talk will review recent evidence providing novel insights into the (i) impairment and (ii) enhancement of memory consolidation in anterograde amnesia. I will report behavioural work from my lab showing that in many amnesic patients, episodic memory retention can be improved markedly when new learning is followed immediately by a brief wakeful rest. Notably, we have shown that this memory boost lasts for at least 7 days in patients with amnesia associated with amnestic Mild Cognitive Impairment/mild Alzheimer's Disease. I will discuss these findings within the theoretical framework of memory consolidation, suggesting that (i) anterograde amnesia can, at least in some cases, be accounted for by a severe disruption of memory consolidation by novel encoding, and (ii) wakeful rest can alleviate this memory impairment by reducing novel encoding.

Seeing what they see: dementia-related visual dysfunction in Alzheimer's disease and Posterior Cortical Atrophy

Sebastian Crutch
Abstract: Visual abilities are critical to living well with dementia, with previous research demonstrating spatial perception to be more strongly associated with activities of daily living than episodic and verbal short-term memory. Visual dysfunction is a core feature of several dementias (e.g. Alzheimer's disease [AD], Dementia with Lewy Bodies), with dementia-related visual dysfunction receiving particular attention in relation to the syndrome Posterior Cortical Atrophy (PCA) which is typically caused by AD but presents with dramatic impairment of vision, not memory. Individuals with PCA offer a unique perspective on the visual difficulties which may be experienced by many individuals with typical AD at a point when memory, language and insight problems limit their ability to communicate what they are experiencing. I will discuss our recent work exploring the nature of vision in PCA (e.g. excessive visual crowding [difficulties with visual clutter] and counter-intuitive greater difficulties reading large than small fonts). I will also report findings and implications from our Seeing what they see project which seeks to develop home-based aids and strategies that compensate for the effects of dementia-related vision loss and improve mobility, safety and independence, and patient and carer quality of life.

Vocabulary relearning in semantic dementia: Positive and negative consequences of increasing variability in the learning experience
Paul Hoffman, Natasha Clarke, Roy W. Jones, Krist A. Noonan
Abstract: Anomia therapy aims to improve patients' communication ability through targeted practice in naming a set of particular items. For such interventions to be of maximum benefit, the use of trained (or relearned) vocabulary must generalise from the therapy setting into novel situations. We investigated relearning in three patients with semantic dementia, a condition associated with poor generalisation of relearned vocabulary. We tested two manipulations designed to improve generalisation of relearned words by introducing greater variation into the learning experience. In the first study, we found that trained items were retained more successfully when they were presented in a variety of different sequences during learning. In the second study, we found that training items using a range of different pictured exemplars improved the patients' ability to generalise words to novel instances of the same object. However, in one patient this came at the cost of inappropriate over-generalisations, in which trained words were incorrectly used to name semantically or visually similar objects. We propose that more variable learning experiences benefit patients because they shift responsibility for learning away from the inflexible hippocampal learning system and towards the semantic system. The success of this approach therefore depends critically on the integrity of the semantic representations of the items being trained. Patients with naming impairments in the context of relatively mild comprehension deficits are most likely to benefit from this approach, while avoiding the negative consequences of over-generalisation.

Symposium Session: New insights into social cognition disorders
15.00-16.30
Convenor: Skye McDonald
Speakers: Skye McDonald, Fiona Kumfor, Katherine Osborne-Crowley, Jacqueline Rushby, Michelle Kelly

Emotion perception deficits following TBI: General or specific?
Hannah Rosenberg, Skye McDonald, Jacob Rosenberg, Frederick Westbrook
Objective: It is now well recognised that adults with severe TBI suffer impairment in the recognition of basic emotions, especially negative emotions (fear, anger, sadness, disgust). There has been virtually no research looking at their capacity to understand a wider variety of emotions including social emotions. That was the aim of the current study.
Participants and methods: Thirty-two participants with moderate-severe TBI (Mean age 48: 25 male) and 32 matched controls (Mean age 45: 25 male) completed the Complex Audio-Visual Emotion Assessment Task (CAVEAT), a novel measure of emotion recognition based on audiovisual vignettes depicting 22 different emotions (11 positive, 11 negative). They also completed standard cognitive tests and self-report measures of psychosocial functioning.
Results: TBI participants performed more poorly than controls in recognising all emotions, rather than displaying a selective impairment in recognising some emotions (e.g., negative vs. positive) compared to others. Injury severity and non-verbal reasoning were unique predictors of emotion recognition. Emotion recognition accuracy in the TBI group was associated with number of friends and self-reported apathy.
Conclusion: Emotion recognition deficits are a direct consequence of TBI, affect a broad range of emotions and have a direct effect on the social dysfunction which is a common outcome of TBI, strengthening the need for targeted remediation.

The impact of context on emotion decoding: Evidence from dementia
Fiona Kumfor, Agustin Ibañez, Olivier Piguet
Objective: The ability to decode emotional information is variably affected in dementia. Individuals with semantic dementia (SD) and behavioural-variant frontotemporal dementia (bvFTD) show pervasive emotion recognition deficits, whereas Alzheimer's disease (AD) patients usually perform within normal limits. Here, we aimed to investigate how contextual information (e.g., body language) influences emotion recognition, within the framework of the social context network model.
Participants and methods: 27 dementia patients (7 SD, 12 bvFTD, 8 AD) and 12 healthy demographically-matched controls were recruited. Participants completed a facial emotion recognition task, where faces were either presented in an emotionally congruent or incongruent context (emotional body language).
Results: Averaged across conditions, both SD ($p=.021$) and bvFTD ($p=.059$) performed worse than controls, whereas AD performed within normal limits ($p=.150$). Notably, however, the effect of contextual information differed across syndromes. On congruent trials, SD showed reduced sensitivity to context, performing significantly worse than bvFTD ($p=.034$), whereas both bvFTD and AD performed similarly to controls ($ps>.05$). In contrast in the incongruent condition, bvFTD ($p<.001$) and AD ($p=.006$) performed worse than controls, whereas incongruent contextual information did not influence performance in SD ($p>.05$)
Conclusions: Our results reveal that in individuals with SD, who show disproportionate anterior temporal lobe atrophy, the integration of contextual information to inform emotion decoding is abnormal. In individuals where this region is less affected (i.e., bvFTD, AD), however, provision of congruent contextual information improves emotion decoding, supporting the social context network model. Clinically, these results open new avenues for rehabilitation of social impairments in dementia.

The role of predicting reward value in social disinhibition after traumatic brain injury
Katherine Osborne-Crowley, Skye McDonald, Jacqueline Rushby, Mike Le Pelley
Objectives: Social disinhibition after traumatic brain injury (TBI) has been associated with inability to update behaviour when reinforcement contingencies change. This may be due to an inability to update information about the value of an expected reward. This study aimed to determine whether participants with TBI could update predicted reward values and whether this was associated with disinhibited behaviour.
Methods: Eighteen participants with TBI and 18 controls completed a reinforcement-learning task in which one stimulus predicted high reward and another predicted low reward (phase 1). These contingencies were reversed halfway through the task (phase 2). Reward positivity, an event-related potential (ERP) component of the electroencephalogram, was measured as the mean amplitude 300-400ms after the predictive stimulus. Recorded conversations with participants were rated for disinhibited behaviour by two judges.
Results: Results were restricted to the two-thirds of all participants whose ERPs differentiated between high- and low-reward cues. Within the control participants, reward positivities were significantly greater to the high-reward cue than the low-reward cue in both phases. In the TBI group, however, this was not the case at either phase. Further, disinhibited participants were more likely to have greater reward positivity to the low-reward cue in phase 2, indicating an inability to update reward values.
Conclusions: Control participants, but not those with TBI, were able to update expected reward values. Further, inability to update was

associated with social disinhibition in the TBI group, suggesting that failure to predict reward value may play a role in disinhibited behaviour after TBI.

Corpus callosum loss contributes to social cognition deficits following traumatic brain injury
Jacqueline Rushby, Katie Dalton, Skye McDonald, Nicklas Parkes, Samantha Allen
Background and Aims: Severe traumatic brain injury (TBI) is highly heterogeneous across sufferers. Despite this, TBI patients commonly develop diffuse axonal injury after injury, which can extend into the corpus callosum (CC). Additionally, TBI patients suffer chronic social and emotional deficits. The present study examined the relationship between directional diffusivity of the white matter tracts within regions of the CC, measured by Fractional anisotropy (FA), and social cognition, measured by The Awareness of Social Inference Test (TASIT).
Method: Diffusion MRI scans were obtained from 17 participants with TBI (age 45, sd 13.7) and 17 matched controls. Participants were administered the TASIT and scores were calculated for emotion evaluation and social inference. Deterministic DTI was performed to obtain FA values from three regions of the CC: genu, body, splenium. TASIT scores and FA values were compared between groups and cc regions. FA values were correlated with TASIT scores.
Results: TBI participants scored lower in both emotion evaluation and social inference compared to controls (p's <.01), and had significantly lower FA values overall. Within groups, FA values were highest in the splenium and lowest in the genu (p's <.01). Higher TASIT scores were related to higher FA values across regions of the CC except the genu.
Conclusions: Overall, TBI participants had lower directional diffusivity of white matter within the CC, indexed by FA, as well as deficits in emotion evaluation and social inference. Emotion evaluation and social inference were both highly related to white matter quality in the CC body and splenium.

Sensitivity of a brief measure of social skills for people with dementia
Michelle Kelly, Skye McDonald
Objective: Social cognition is commonly impaired in people with dementia. This leads to misunderstandings, confusion and aggression, and can negatively impact upon relationships with caregivers. Clinicians working with people with dementia do not routinely assess social cognition and this is likely due to the unavailability of an appropriate measurement tool. This study aimed to examine the sensitivity and construct validity of a brief screening test of social cognition.
Participants and Methods: The Brief Assessment of Social Skills (BASS) was administered to 10 people with a diagnosis of dementia (M age = 70.5) and 26 healthy controls (M age = 72). Groups did not differ in terms of age, gender distribution, years of education or age at retirement. In order to establish evidence for construct validity participants also completed a number of other existing measures of social cognition, such as The Awareness of Social Inference Test and the Balanced Emotional Empathy Scales.
Results: The BASS demonstrated adequate sensitivity with the control group performing significantly better than those with dementia ($p < .001$). Furthermore, significant (moderate to strong) correlations were observed between performance on the sub-domains of the BASS (emotion perception, empathy, social disinhibition and social reasoning) and the equivalent established tests of social cognition.
Conclusions: A tool designed to quickly and effectively identify social cognition impairment in people with dementia will provide a valuable adjunct to cognitive assessment in identifying antecedents of difficult behaviours. Furthermore it will provide valuable information to formal and informal caregivers.

Symposium Session: Understanding Gulf War illness: Brain-immune biomarkers, cognitive functioning and treatment development strategies 25 Years after the War – 15.00-16.30
Convenor: Kimberly Sullivan
Discussant: Fiona Crawford
Speakers: Kimberly Sullivan, Mohamed Abou Donia, Maxine Krengel, William Meggs, Julia Golier

Brain Immune Interactions in Gulf War Illness: Cytokines and Cognition in US Military Veterans
Kimberly Sullivan, Joanna Cirillo, Maxine Krengel, Patricia Janulewicz-Lloyd, Rosemary Toomey, Fanny Collado, Zachary Barnes, Timothy Heeren, Emily Sisson, Christine Chaisson, Lea Steele, Nancy Klimas
Objective: Identifying objective biomarkers of persistent symptoms in US veterans with Gulf War illness (GWI) has been a focus at the Boston Gulf War Illness Consortium. Symptoms of GWI include fatigue, pain and cognitive problems. Our prior studies showed objectively-measured cognitive decrements in veterans with GWI. The next step is to evaluate these deficits in relation to proinflammatory cytokine biomarkers. This study compared a cognitive battery (testing attention/executive, memory, visuospatial and motor functions) and 16 plasma cytokine biomarkers in veterans with GWI versus healthy GW veterans. Participants and **Methods:** Participants included 36 GW veterans (28 with GWI, 8 healthy controls). Cases and controls did not differ by age, sex or education. The study population had a mean age of 50 years and 15 years of education. Cytokines were evaluated by a high sensitivity chemiluminescent multiplex ELISA assay.
Results: Veterans with GWI had significantly higher mean Connors CPT3 reaction time and Purdue pegboard scores and lower CVLT-II recognition memory scores ($p<.05$). In addition, CPT3 mean reaction time, T scores and commission errors significantly correlated with levels of IL6, IL13, IL1-apha and TNF-alpha and inversely correlated with IL12 ($p<.05$) in GWI cases.
Conclusions: This study is the first to report plasma cytokine biomarker differences and reduced performance on tasks of information processing speed and sustained attention in veterans with GWI. Further study of brain-immune interactions and cognitive outcomes are being conducted in a larger cohort to further validate these cognitive-immune biomarker findings in GWI.

Cytokines, Cognition and Gulf War Illness in a US Military Veteran Cohort
Zachary Barnes, Kimberly Sullivan, Mary Ann Fletcher, Fanny Collado, Elizabeth Balbin, Nancy Klimas
Objective: Recent studies have focused on identifying objective biomarkers of Gulf War Illness (GWI) in 1990-1991 US Gulf War veterans. Symptoms of GWI include fatigue, pain and cognitive problems. Our prior studies demonstrated the presence of increased pro-inflammatory cytokines in veterans with GWI but they have not been compared with cognitive outcomes. This study compared the Paced Auditory Serial Addition Test (PASAT) and plasma cytokine biomarkers in veterans with GWI and in healthy GW era veterans. In total, 16 cytokines were compared between groups.
Participants and Methods: Participants included 70 GW veterans including 35 with GWI and 35 healthy veteran controls. Participants were matched for age and gender. Participants had a mean age of 44 years, 23% were women and 34% were Caucasian. Cytokines were evaluated by a high sensitivity chemiluminescent multiplex ELISA assay.
Results: Veterans with GWI had significantly higher levels of IL8, IL13 and TNF-beta and mean PASAT scores were significantly lower for Trials 3 and 4 ($p<.05$) on ANOVA analyses. The composite score of PASAT trials 1-4 significantly correlated with IL1-apha levels in this study cohort ($p<.05$).
Conclusions: This study is the first to report plasma cytokine biomarker differences and reduced performance on a task of information processing speed and complex tracking in veterans with GWI. These results suggest that further study of brain-immune interactions and attentional outcomes should be conducted in larger cohorts to assess whether pro-inflammatory cytokines may be used as objective biomarkers of cognitive symptoms in GWI and targeted therapeutically to improve cognitive symptoms.

Screening for novel objective central nervous system biomarkers in veterans with Gulf War Illness
Mohamed Abou Donia, Kimberly Sullivan, Lisa Conboy, Efi Kokkotou, EM El-Masry, Eric Jacobson
Objective: Gulf War Illness (GWI) is primarily diagnosed by symptom report and no clear objective diagnostic biomarkers currently exist. This study was designed to identify objective biomarkers of GWI in Gulf War veterans compared with symptomatic

non-veteran controls with chronic lower-back pain (LBP). Circulating autoantibodies from ten proteins associated with the central nervous system (CNS) was compared between groups. Our prior studies have demonstrated the presence of autoantibodies to neuronal and glial proteins in patients with brain injury. We screened the sera of veterans with GWI for the presence of these autoantibodies.
Participants and Methods: Participants included 20 veterans with GWI and 10 non-veteran symptomatic controls. Autoantibody presence was evaluated by western blot analysis against the following proteins: neurofilament triplet proteins (NFP), tubulin, microtubule associated tau proteins (tau), microtubule associated protein-2 (MAP-2), myelin basic protein (MBP), myelin associated glycoprotein (MAG), glial fibrillary acidic protein (GFAP), calcium-calmodulin kinase-2 (CaMKII) and glial S100B protein. Serum reactivity was measured as arbitrary chemiluminescence units.
Results: Veterans with GWI had significantly higher levels of autoantibody reactivity in all CNS proteins examined except S100B with values ranging from 9 times higher than controls for CaMKII to 2.5 times higher for MBP.
Conclusions: This pilot study is the first to demonstrate the presence of serum autoantibodies to CNS-specific proteins in veterans with GWI. These results confirm at least a prior history of neuronal injury/gliosis in these veterans. Serum circulating autoantibodies may be used as objective biomarkers for the diagnosis of GWI, upon validation with larger study cohorts.

Exploring the Association between Cognitive Symptoms and Exposures in a Cohort of 1990-1991 US Gulf War Veterans
Megan Yee, Daniel Seichepine, Tara Nolan, Patricia Janulewicz, Kimberly Sullivan, Maxine Krengel
Objective: Gulf War Veterans (GWV) have reported chronic health symptoms since returning from war, including persistent cognitive difficulties. Environmental exposures are considered an etiological factor, but our recent research demonstrated traumatic brain injury (TBI) as another potential factor. Toxicants are associated with chronic multisymptom illness, but their association and the association of TBI with cognition remains unclear. The aim of this study was to determine if veterans endorsing chronic cognitive symptoms reported different rates of exposures compared to veterans without such symptoms. Participants and **Methods:** Three hundred and ninety-nine 1990-1991 GWV from the US Fort Devens Cohort responded to a survey. Veterans were divided by those endorsing cognitive symptoms (n=296) or not (n=103). Exposures assessed included anthrax vaccine, chemical or biological warfare, pesticides, pyridostigmine bromide pills (PB), and TBI. Independent samples t-tests and chi-square test of independence were performed.
Results: Age, education and sex were similarly distributed for both groups (p>0.05). Veterans reporting exposures to anthrax vaccine [OR=3.12 (1.62,6.03)], chemical/biological warfare [OR=2.75 (1.59,4.76)], and pesticides [OR=1.92 (1.07,3.450)] had significantly increased odds of having cognitive symptoms (p<0.05). Veterans endorsing cognitive symptoms also reported significantly higher rates of TBI (p=0.008).
Conclusions: Significant associations were found between anthrax vaccine, chemical/biological warfare, pesticides and TBI with chronic cognitive symptoms. Further studies are needed to examine the effect of these exposures in combination. However, these results are an important first step in identifying potential factors of poor cognition in veterans. These findings could influence future treatments for GW veterans and other veterans reporting similar symptoms such as OEF/OIF veterans.

Double-blinded Placebo-Controlled Cross-over Pilot Trial of Naltrexone to Treat Gulf War Illness
William Meggs, Kori Brewer, Allison Mainhart
Objective: 30% of USA veterans of the 1991 Gulf War developed Gulf War Illness (GWI) with chronic fatigue, pain, and neuropsychological disabilities. Organophosphate exposure occurred. Naltrexone down-regulates neuroinflammation that occurs in organophosphate illness (Chen, 2012; Younger et al, 2014). A prior naltrexone study for chronic pain found improvement in responders but not others (non-responders)(Younger et al., 2013).
Participants and Methods: Participants met the Kansas GWI case definition (Steele, 2000). A double-blinded, placebo-controlled randomized-crossover design tested naltrexone 4.5 mg/day for three months, with a one-month wash-out before crossover. Clinical global impression scale (CGIS), Visual Analogue Scale(VAS), and Connors Continuous Performance Test (CCPT), and the SF-36 Health Survey were used to assess response.
Results: Forty participants were enrolled. 40 completed the protocol. The CGIS detected an improvement in symptoms in 45% (n=15) (responders), with another 21% (n=7) rated as being much improved. The remaining 18 were non-responders. When scored on the SF-36 Health Survey, responders were found to have significantly less disability than non-responders with respect to physical limitations (p=0.05), fatigue (p=0.01) and emotional limitations (p=0.03). Responders also showed strong trends toward more improvement on VAS compared to the Non-Responders. Standard deviation of hit response time on the CPT was -1.02± 0.23(95% CI= -1.49 - -0.55) with p=0.02 with naltrexone but did not change with placebo. Serum levels of naltrexone ranged from 1.5-18 ng/ml.
Conclusion: Naltrexone may be a suitable treatment for some with GWI. Study of the factors determining response and non-response are needed.

A Controlled Trial of a Glucocorticoid Receptor Antagonist in Gulf War Veterans with Chronic Multisymptom Illness
Julia Golier, Rachel Yehuda
Objective: To assess the effect of the glucocorticoid receptor antagonist mifepristone in Gulf War veterans with CMI. A randomized, double-blind, cross-over trial of mifepristone with two six-week treatment phases, separated by a one-month washout period, was conducted at a US Veterans Affairs hospital between 2008-2011.
Participants and Methods: Participants were randomized to receive either 200 mg of mifepristone per day or matched placebo first. The primary clinical outcome measure was change in self-reported physical health. Neurocognitive functioning and self-reported measures of depression, PTSD and fatigue were secondary outcomes.
Results: Sixty-five participants enrolled, of whom 36 were randomized and 32 (mean age, 49.1 [7.2] years) completed the study. Mifepristone treatment was not associated with improvement in self-reported physical health or in other self-reported measures of mental health. Mifepristone treatment was significantly associated with improvements in verbal learning (p= 0.008, d= 0.508) in the absence of improvement in other cognitive measures. Baseline morning cortisol levels and lysozyme IC50-DEX, a measure of peripheral glucocorticoid sensitivity, displayed a significant relationship with endpoint verbal learning scores. The magnitude of cortisol change during treatment mediated the improvement in verbal learning.
Conclusions: The data suggest a moderate dose of mifepristone may have cognitive-enhancing effects in CMI, in the absence of an effect on other measures of health status. The treatment-related improvements in verbal learning suggest the possibility of hippocampal involvement. Further study is warranted to determine whether mifepristone treatment can yield clinically meaningful improvement in cognitive function in CMI or other conditions associated with HPA axis dysregulation.

Oral Presentation Session: Executive function/TBI 15.00 - 16.30

Are executive function deficits a transdiagnostic risk factor for psychopathology?
Zvi Shapiro, Hilary Galloway-Long, Cynthia Huang-Pollock
Objective: In contrast to historical conceptualizations of psychological disorders as distinct categorical conditions, it is now widely understood that co-morbidities between disorders are extensive. As such, there has been a call to better understand the dimensional liabilities that are common to and influence the development of multiple psychopathologies, as supported and exemplified by the NIMH RDoC framework. Deficits in executive functions, and working memory in particular, have been widely documented in Attention Deficit Hyperactivity Disorder. Though it does not enjoy the same prominence for internalizing (e.g. ANX/DEP) and other externalizing (e.g. ODD/CD) disorders, empirical evidence of working memory weaknesses in these disorders does exist.
Participants and Methods: In a sample of 415 community recruited

children aged 8-12, we use a latent variable SEM approach to examine the degree to which working memory deficits represent a cognitive liability associated with the development of common and discrete dimensions of psychopathology.
Results: We fit a bi-factor model to parent reports of behavior from the DISC-4 and BASC-2, and included a latent working memory factor as a predictor of the internalizing, externalizing and general "p-factor" (RMSEA = 0.044, CFI = 0.984). Only the general "p-factor" (b = -.261, p = 0.004) and the externalizing latent factor (b = -.401, p < .001) were significantly associated with poor working memory, while the internalizing factor was not.
Conclusions: Thus, our work suggests that though working memory deficits represent a core liability within externalizing disorders specifically, they represent, a liability for mental health disorders generally as well.
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The interactions between the amygdala and the ventromedial prefrontal cortex in their contributions towards emotional reactivity
David Andrewes, Lisanne Jenkins, Christine Ernest, Andrew Kaye, Patricia Desmond
Objective: The amygdala (AM) and the ventromedial prefrontal cortex (VMPFC) are seen within affective neuroscience theory as being at the core of the human emotional system. The research results from two studies are reported that allow insight into the functional contributions of these two areas and their interdependence.
Methods: Patients following temporal lobectomy (*n*=40) had an en bloc resection including the AM and 10 patient with neurosurgery within the VMPFC (n=8) and their controls were researched. Emotional induction with standardised film clips (Jenkins and Andrewes, 2012) with tests of emotional perception. Patient's self and observed response and videoed expressions were measured with heart rate and skin conductance measures.
Results: Patients, especially those following left temporal lobectomy showed a difficulty in recognising the negative valence of emotional film clips and right temporal patients showed a reduced expression. These results were also shown by patients with neurosurgery to the VMPFC, but results by this last group showed both exaggerated rating of both congruent and incongruent ratings (e.g. positive ratings of negative films). This was both for the negative and positive film clips.
Conclusions: A model is presented that describes the interaction between these two brain areas in which the AM is involved in the immediate acquisition of fear and the initial reaction to threatening information while the VMPFC plays an emotionally moderating role over time and is more involved with the anticipation of emotional response of social others. The model has relevance to psychopathology with special relevance to post-traumatic-stress-disorder.
Correspondence: *David Andrewes, University of Melbourne, andrewes@unimelb.edu.au*

Social cognition impairments after aneurysmal subarachnoid hemorrhage
Anne M. Buunk, Jacoba M. Spikman, Wencke S. Veenstra, Linda C. Meiners, Rob J.M. Groen
Objective: Impaired social cognition (SC) is a possible underlying cause of behavioral and interpersonal changes after aneurysmal subarachnoid hemorrhage (aSAH). To date, SC has not been investigated after aSAH. Therefore, we aimed to investigate SC after aSAH and its relationship with frontal lesions.
Participants and Methods; 89 aSAH patients (mean age 53.2 years) conducted a neuropsychological test battery in the subacute phase (mean = 4.8 months) post-SAH. A broad range of SC tests was administered; Emotion recognition (Facial Expressions of Emotion - Stimuli and Test; FEEST), Theory of Mind (Cartoon Test, Faux Pas Test; FP), and emotional empathy (FP Empathy Score, Balanced Emotional Empathy Scale; BEES) were investigated. Frontal infarctions on post-SAH MRI were registered. Between-group comparisons and correlations were used.
Results: ASAH patients scored significantly worse on the FEEST (M = 45.64), Cartoons (M = 18.30) and Faux Pas (M FP correct = 4.17, M FP Empathy = 1.84) than controls (M = 48.76, M = 23.50, M = 4.63, M = 2.52 resp.), all *p*s < 0.05. BEES scores did not differ significantly between patients and controls. No significant correlations were found between the presence of frontal infarctions and SC tests.
Conclusions: In the subacute phase after aSAH, several aspects of social cognition were clearly impaired (i.e. emotion recognition, Theory of Mind, empathy). These impairments were not related to frontal lesions. Considering the adverse consequences for daily functioning of social cognitive deficits, neuropsychological assessment after aSAH should include social cognition tests for all patients regardless of their lesion locations.
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The impact of impact! Investigating executive problems related to Chronic Traumatic Encephalopathy (CTE) caused by contact sports
Ashok Jansari, Weronika Walczak
Objective: There is a growing understanding that repeated small head injuries through sport can result in Chronic Traumatic Encephalopathy (CTE). The impact of this on executive functions (EFs) has been difficult to evaluate because of lack of sensitivity and ecological-validity of current clinical assessments. We investigated EFs in adults who engage in contact sports with the Jansari assessment of Executive Functions (JEF©), an ecologically-valid virtual-reality task. JEF© has been demonstrated to be sensitive for assessing adults with acquired brain injury (Jansari et al, 2014). Performance is evaluated on eight EF constructs: Planning, Prioritisation, Selective-Thinking, Creative-Thinking, Adaptive-Thinking, Action-Based Prospective Memory (PM), Event-Based PM and Time-Based PM.
Participants and Method: Performance on JEF© of 17 amateur Boxers and 17 Wrestlers was compared to that of 17 matched controls who did not participate in contact sports. Level of different types of head injuries was evaluated with a standard questionnaire.
Results: A one-way MANOVA on JEF© performance revealed a main effect of group $F(16,82)=2.36$, $p=.006$, Wilks $\lambda= 0.469$, η^2 of 0.315 with the power to detect the effect high (.975). Further, there was a significant difference in level of head injuries between the groups $F(2,48)=12.63$, $p<.001$ with controls having significantly fewer injuries than both other groups and boxers having significantly more than the wrestlers.
Conclusions: Our results demonstrate that engaging in contact sports is associated with diminished EFs. The differences in head injuries between the groups shows that level of contact in a sport can have a substantial impact on cognitive functions that are vital to everyday behaviour.
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Evolution of health-related quality of life associated with post-traumatic stress and person characteristics of patients and their relatives 12 months after severe traumatic brain injury.
Chiara S. Haller
Objective: Severe traumatic brain injury (TBI) is a major health problem and can lead to extensive mental and physical deficits, which affect general recovery, and health-related quality of life (HRQoL) of the patient post-injury. In the present investigation, the relationship between PTS symptom severity and HRQoL of the patient, as well as the influence of person characteristics of the relative on the recovery process of the patient were of interest.
Method: A total of 190 patients from a prospective cohort study of severe TBI in Switzerland were evaluated. The following assessments were done at 3, 6, and 12 months post-injury: The Short Screening Scale for DSM-IV PTSD (SSS-PTSD), the SF-12, Patient Competency Rating Scale for Neuro-Rehabilitation (PCRS-NR), the Coping with Stressful Situations Questionnaire (CISS), the Neo-Five-Factor-Inventory (NEO-FFI), and the Mindful Creativity Scale short form (MCS).
Results: Multilevel models predicting HRQoL revealed higher levels of PTS symptom severity to be associated with mental HRQoL (ps < 0.05). MCS, personality, and coping of the relative influenced the functioning of the patient (ps < 0.05).
Conclusion: The results suggest that effective rehabilitation after severe TBI may be enhanced by the management of PTS symptoms, and the inclusion of the relative in the process.

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Ecological cognitive Rehabilitation based on interactive video and eye-tracking technologies.
Rocio Sanchez-Carrion, Jose Maria Martinez-Moreno, Javier Solana, Alberto Garcia-Molina, Antonia Ensenat, Jaume Lopez, Patricia Sanchez-Gonzalez, Celeste Aparicio-Lopez, Juan Luis Garcia-Fernandez, Teresa Roig-Rovira, Enrique J. Gomez
Objective: The overall aim of the neuropsychological rehabilitation following traumatic brain injury (TBI) is to improve daily functions. Virtual reality and interactive video have emerged as new treatment approaches that allow everyday living skills allows training, in a practical and realistic manner. Interactive Video (IV) technology allows therapists to work with virtual settings that reproduce real situations. A cognitive rehabilitation environment using interactive video and eye-tracking technologies integration is proposed.
Participants and Methods: We compared TBI patients (n=20) and healthy subjects (n=20) performance in a daily living activity using interactive video (Buying bread). The execution on this activity (subdivided in 3 tasks and 15 objectives) was analyzed. Additional analysis on visual attention was carried out using eye-tracking technology.
Results: Significant between-group differences were observed in performance of the "Buying bread" activity. TBI patients achieved the goal but needed more time to complete the activity and made greater number of mistakes, compared with healthy subjects.
Eye-tracking monitoring indicates that TBI patients show a more dispersed interaction, higher percentage of visual attention loss and more time analyzing each scene of the interactive video.
Conclusions: TBI patients performed worse than healthy subjects in terms of accuracy, processing speed and visual attention pattern, in a virtual daily living activity. Interactive videos can be considered a helpful approach for ecological cognitive rehabilitation following TBI. Combined with eye-tracking monitoring, additional information about interaction and visual attention can be provided.
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Thursday 7th July 2016 Parallel Session D: 08.30 - 10.00

Invited Symposium Session: Avoiding the silver tsunami: Strategies to optimize brain aging - 08.30 - 10.00
Convenor and Discussant: Joel Kramer
Speakers: Rose Ann Kenny, Karen Ritchie, Linda Clare

Orthostatic BP may be a modifiable risk factor for age related brain health. This will be discussed in context of current literature and TILDA.
Rose Anne Kenny
Abstract: Ageing is associated with neural, vascular and hormonal changes which present as dysfunction in heart rate and blood pressure. Consequences are falls, orthostatic dizziness, and episodes of transient loss of consciousness. Data from the Irish longitudinal study on ageing (Tilda) further suggests associations with cognitive function and mood in healthy adults. These changes are particularly evident in response to physiological stressors such active standing.
Tilda is a large population based longitudinal study of 8500adults aged 50 and over, reviewed every two years, with subjective and objective neuropsychological and, mental health assessments coupled with phasic blood pressure and heart rate responses to standing.
Orthostatic blood pressure responses were impaired in 7% of 50 yr olds compared with 40% of those over 80 yrs. Impaired stability of BP was associated, in cross sectional and longitudinal analyses, with falls, fatigue and frailty in addition to impaired global, executive, attentional function and depression, particularly in people with supine hypertension.
In a further longitudinal study of adults with mild cognitive impairment, conversion to dementia was significantly more likely in people with impaired BP stability after stand.
This raises the possibility that impaired BP stability after stand may contribute to cognitive impairment, possibly by cerebral hypoperfusion.
Tolerance of cerebral hypoperfusion and symptomatic BP thresholds during orthostaic change varies in adults. One determinants of variation may be cerebral autoregulation.
A measure of cerebral tissue perfusion and autoregulation – near infrared spectroscopy- is measured during orthostasis in Tilda and these analyses will be presented in context of cognitive function and symptoms during stand.

Karen Ritchie
Abstracts: Late-onset Alzheimer's disease has long been considered a disorder of the elderly and synonomous with dementia, however, increasing evidence suggests that changes in AD-associated biomarkers are detectable decades before dementia onset. Theoretical models of pre-clinical changes have focused on increases in amyloid and tau and decreases in hippocampal volume as being the principal characteristics with cognitive dysfunction occurring only in the prodromal period. Using data from a longitudinal general population study we were able to demonstrate these changes using empirical evidence, further showing 1) that cognitive decline may be detected at least a decade before dementia diagnosis and 2) an interaction between biomarkers and clinical markers such that the decrease in cognitive performance is accelerated with an up-swing in abeta accumulation. These findings suggest an alternative window for therapeutic intervention in the pre-clinical period and the feasibility of using cognitive changes as an outcome measure. This and other studies suggest that AD may not in fact be a disease of the elderly but a clinically silent disease of mid-life diagnosed in a terminal stage characterized by dementia. Given that many of the principal known risk factors for dementia also occur during this period it would seem that intervention should focus not only on pharmaceutical intervention to reduce the progression of pathological brain changes but also clinical and environmental management of risk factors. We show through epidemiological modelling (Population Attributable Fractions) based on prospective studies that prevention of stroke, management of insulin resistance and depression, dietary improvement and cognitive stimulation could not only reduce by a third the number of new cases in the coming decade, but would be more powerful than eliminating the ApoE e4 allele. In conclusion it is highly likely that AD is a disease of mid-life characterized by measurable cognitive change but not dementia, and that future intervention strategies should focus not only on pharmaceutical intervention in the pre-clinical period but also reduction of environmental risk.

Cognitive reserve mitigates the negative association between mood and cognition: evidence from a national cohort
C. Opdebeeck, F.E. Matthews, R. T. Woods, C. Brayne, L Clare
Background: Cognitive reserve (CR) has been associated with better cognitive function in older people. In contrast, mood disorders are associated with poorer cognitive function but with varying results across studies, suggesting that other factors may moderate the association. The aim of this study was to investigate whether a comprehensive indicator of CR acts as a moderator of this association in CFAS II, a large cohort study, representative of community-dwelling older people in England.
Method: Six thousand six hundred and seventy-five dementia-free people aged 65+ had complete data on the measures of CR, mood, and cognition. The sample was divided into those with low, medium, and high levels of CR and into those with no, a subthreshold, or a clinical mood disorder.
Results: Those with low levels of CR had significantly poorer cognitive performance than those with medium or high levels of CR, while those with no mood disorder performed significantly better than those with a subthreshold or clinical mood disorder. CR did moderate the negative association between mood and cognitive function; the negative effect of a clinical mood disorder on cognitive performance was 2.5 times greater in the low than the high CR group.
Conclusion: These results demonstrate that CR, when considered in terms of multiple proxy measures, can mitigate the negative association between lowered mood and cognition, emphasising the importance of continuing to build CR across the lifespan in order to maintain cognitive health.

Symposium Session: The modality that neuropsychology neglected: Interoception
08.30-10.00
Convenor: Paul Jenkinson
Discussant: Aikaterini (Katerina) Fotopoulou
Speakers: Aikaterini (Katerina) Fotopoulou, Sarah Garfinkel, Hyeong-Dong Park

The Touched Self: Affective Touch and the Body Awareness after Right Hemisphere
Aikaterini (Katerina) Fotopoulou, Paul Jenkinson
Abstract: In this talk we will focus on how affective touch, and particularly a specialized modality characterized by peripheral and central neurophysiological specificity, namely the CT afferent system, shapes our perception of our own body as ours and as under our volitional control. Specifically, we will present (1) recent, accumulating evidence in healthy volunteers (2 experiments, N = 80) pointing to the crucial role of affective touch in the construction and maintenance of fundamental facets of bodily awareness, such as the sense of body ownership and motor awareness, (2) recent experimental and lesion findings pointing to the role of affective touch in unawareness of the body following right hemisphere stroke, indicating the importance of affective touch in restoring impaired feelings of body ownership. Overall, these studies draw on perspectives from multiple mind and brain fields in order to highlight how a specialized neuroemotional system underlies affective touch, an interoceptive modality by which humans communicate social affiliation and care and establish self-other boundaries.

The relationship between dimensions of interoception in Autism and Schizophrenia
Sarah Garfinkel, Geoff Davies, Charlotte Rae, Anil Seth, Kathryn Greenwood, Hugo Critchley
Objective: Autism and Schizophrenia are associated with distinct emotion impairments and we tested the hypothesis that these may arise from altered interoceptive dimensions.
Participants and Methods: Individuals with Autism (N=20) and Schizophrenia (N=40) were matched to control participants, and were tested for their interoceptive accuracy (heartbeat perception) and interoceptive sensibility (subjective self-report about interoceptive aptitude).
Results: Results show individuals with Autism have reduced interoceptive accuracy and exaggerated interoceptive sensibility, reflecting an impaired ability to objectively detect bodily signals alongside an over-inflated subjective perception of bodily sensations. The divergence of these two interoceptive axes can be computed as a trait prediction error which predicted deficits in emotion sensitivity. In contrast, individuals with Schizophrenia displayed an enhanced correspondence of objective and subjective measures of interoception relative to matched controls.
Conclusions: Our results indicate opposing origins of emotion deficits in Autism and Schizophrenia at the interface between body and mind, specifically in regard to metacognitive awareness into interoceptive information. These findings provide insight how different objective and subjective dimensions of interoception may predict different emotion impairments characteristic of distinct clinical disorders, with implications for potential treatment targets.

Interoceptive signals and their neural processing underlie self-consciousness
Hyeong-Dong Park, Olaf Blanke
Abstract: Internal bodily signals and their neural representation have been proposed to underlie self-consciousness (Damasio et al. 2013; Park et al. 2014b; Blanke et al. 2015). Here, we present two lines of evidence from our laboratory supporting the link between interoceptive signals and self-consciousness. First, multisensory integration between interoceptive and exteroceptive signals impacts bodily self-consciousness. For instance, manipulation of integration between cardiac and visual signals can alter states of bodily self-consciousness, a phenomenon termed cardio-visual full-body illusion (Aspell et al. 2014). A recent clinical research further showed that these abnormal states of bodily self-consciousness are associated with damage to insular cortex (Heydrich et al. 2013; Ronchi et al. 2015) which is a primary viscerosensory cortex. These findings are confirmed by a recent fMRI study that BOLD activity in the insular cortex reflects altered state of bodily self-consciousness induced by the cardio-visual full-body illusion (Maria Laura, In preparation). Second, neural processing of interoceptive signals reflects altered states of bodily self-consciousness. To directly test the association between neural processing of interoceptive signals and bodily self-consciousness, we measured neural responses to heartbeats (Park et al. 2014a) using EEG while participants' bodily self-consciousness was manipulated by the visuo-tactile full-body illusion (Lenggenhager et al. 2007). We found that transient modulation of neural responses to heartbeats in the posterior cingulate, another viscerosensory cortex, correlates with changes in bodily self-consciousness (Park et al. Under review). Taken together, our findings provide novel and robust evidence to the proposed link between interoceptive signals and self-consciousness.

Symposium Session: Are modern clinical neuropsychological assessment procedures really "modern?"
08.30 - 10.00
Co-Convenors: Bernice Marcopulos and Emilia Lojek
Discussant: Ben Schmand
Speakers: Diane Howieson, William Barr, Roy Kessels, Laura Germine

Current Status of Neuropsychological Tests and Assessment Procedures
Diane Howieson
Abstract: Neuropsychological tests are used for a wide variety of purposes: cognitive assessment of strengths and weaknesses, diagnosis, prognosis, treatment planning and evaluation, and exploration of brain-behavior relationships. Do we need more? Do we need better? Do we need to address different questions? How does the conceptual basis of neuropsychological tests agree with modern theories of brain functional organization? In this talk, I will review the current status of neuropsychological tests and assessment procedures and make recommendations for improvements. An impressive number and variety of neuropsychological tests are available. Most tests are developed with a goal of assessing the ability of people to perform daily tasks. Some of these tests have been incorporated into disease-specific cognitive batteries. However, shortcomings of tests may include: i) incomplete demographic characteristics of normative data; ii) limited reliability, validity, and reliable change indices because of data from small sample sizes; iii) lack of co-normative data when combining tests; iv) language- and culture-specific tests. In addition, the use of computer adaptive testing is uncommon although it has the potential to make more efficient otherwise lengthy examinations. We need to understand the context in which a person's cognitive problems occur, which often involves the interaction of complex variables. Examples include the role of emotions and uncertainty on decision-making. We also benefit from cognitive neuroscience's study of more discrete cognitive processes. Although challenges persist, real progress is being made, particularly because of the contribution of new technological developments.

Historical Trends in Neuropsychological Testing
William Barr
Abstract: Examining the historical origins of our methodology provides us with a theoretical framework to critically examine our current work while providing us with a basis to move on to the future. This lecture will review the evolution of neuropsychological assessment from its 19th Century roots through its use in modern-day clinical and research settings. Emphasis will be placed on how many of the neuropsychological tests, used in current day practice were developed initially as part of the intelligence testing movement, clinical demands arising from World Wars I & II, and the development of clinical psychology and neuropsychology as fields of professional practice. Data from recently published surveys on neuropsychological test usage will be presented to demonstrate that the field has been rather slow in making changes to the tests used in clinical practice, with little progress made in developing or utilizing new test paradigms or adapting to advances made in computer technology. There are also indications that the field has failed to make adjustments in producing testing methods and norms that are applicable society's changing demographics and demands made by administrative bodies that pay for our services. The field of neuropsychology will benefit from looking more closely at where it

came from, in terms of its tests and technology, while paying greater attention to where it heads to in the future.

Improving precision in neuropsychological assessment: filling the gap between paper and pencil tests and paradigms from cognitive neuroscience
Roy P.C. Kessels
Abstract: In cognitive neuroscience, well-controlled, highly specific paradigms have been developed to measure cognitive processes over the last decades, often using computer-assisted presentation and response registration. This approach is in contrast with the traditional paper-and-pencil tests used in neuropsychology, which typically assess cognitive function in a less specific manner, even at the level of a cognitive domain. As a result, important aspects of cognitive (dys)function may be missed during a neuropsychological assessment. In this talk, I will address six important challenges for integrating experimental paradigms from cognitive neuroscience in the clinical practice of neuropsychologists: i) experimental paradigms are often too precise and overly specific, which would make neuropsychological assessment too complex and lengthy in relation to clinical outcome; ii) while computer-assisted assessment method have been introduced in neuropsychology over 30 years ago, technical limitations may even today hamper their application in clinics; iii) psychometric properties of methods used in cognitive neuroscience are ill-studied or poor, especially when used outside the context of young academic participants; iv) many paradigms from cognitive neuroscience rely on reaction times rather than accuracy, limiting their use in the many brain-injured patients with processing speed deficits; v) predictive and ecological validity of cognitive neuroscience methods is often unclear; vi) technological progress (e.g. Moore's law) seriously affects the continuous availability of computerized assessment methods. To overcome these challenges, cognitive neuroscientists and clinical neuropsychologists should work together to develop and validate novel paradigms for clinical assessments that are platform-independent, reliable, valid, user-friendly and easy to use in clinical practice.

The path from cognitive neuroscience to neuropsychology: Partnering with participants for rapid test development and validation
Laura Germine
Abstract: The research and development cycle for creating and refining measures of cognitive functioning is often lengthy and costly, especially when this includes the need to accommodate rapid changes in technology. As a result, neuropsychological assessment – including computerized neuropsychological assessment - has often lagged far behind advances in neuroscience and psychology. In this talk, I will discuss the methods my colleagues and I have developed through our website, TestMyBrain.org, to adapt measures from cognitive neuroscience and clinical neuropsychology for web-based platforms and broad dissemination. TestMyBrain takes advantage of the strong public interest in the mind and brain to drive test development: everyday people participate in research studies on the web in exchange for feedback on their performance. TestMyBrain receives high levels of traffic (1.5 million tested since 2008). Data from these participants can be used to develop and validate novel web-based cognitive tests, adapted from cognitive neuroscience, across devices and browsers. Initial versions of these tests can then be iteratively refined to improve reliability, sensitivity, and accessibility. Ultimately, we envision a world where (1) the advancement of neuropsychology is based on the active involvement of patients and participants, (2) the neuropsychological community has access to high-quality open source cognitive testing tools that can be readily adapted to changes in technology, and (3) researchers and clinicians can use the right tools to answer the right questions, capitalizing on the most recent advances in clinical and cognitive neuroscience to better understand the minds and brains of individuals.

Symposium Session: Understanding and treating the chronic and progressive consequences of moderate-severe traumatic brain injury
08.30 - 09.30
Convenor: Robin Green
Discussant: Huw Williams
Speakers: Robin Green, Jennifer Tomaszczyk, Brenda Colella

Neural and cognitive deterioration in the chronic stages of moderate-severe traumatic brain injury
Robin Green, Brenda Colella, Joanna Glazer, Jerome Maller, David Mikulis
Objective: To demonstrate degeneration of the brain in the chronic stages of moderate-severe traumatic brain injury (TBI), as well as cognitive declines.
Participants and Methods: 80 patients with moderate-severe TBI were recruited from the in-patient Acquired Brain Injury program at a large, urban Canadian rehabilitation hospital. Participants were prospectively administered comprehensive neuropsychological assessment at 2, 5, 12 and 24 months post-injury, and quantitative MRI at 5, 12 and 24 months in this longitudinal study.
Results: Replicating and extending our earlier findings, we have found that the whole brain, hippocampi and corpus callosum shrink significantly from 5 to 12 to 24 months post-injury, and that white matter integrity (using DTI) is also lost across time. Using growth curve modelling, there were no significant differences between the 5 to 12 vs. the 12 to 24 months post-injury slopes, and thus no evidence of tapering of degeneration across the periods studied. At a behavioural level, we also replicated and extended our earlier findings, finding frank cognitive declines from 5 to 12 months post-injury (in a minority of patients) and from 12 to 24 months post-injury in nearly 30% of participants.
Conclusions: There is deterioration of the brain and cognition in the chronic stages of injury. These findings suggest new directions for treatment research (i.e., offsetting deterioration) and novel treatment targets. Research is particularly needed to ascertain whether deterioration continues beyond these first two years, and if so, whether at a steeper, similar or shallower rate.

Increased depression and anxiety from 2 months to 2 years following moderate-severe traumatic brain injury
Jennifer Tomaszczyk, Alexander Terpstra, Todd Girard, Naomi Koerner, Brenda Colella, Robin Green
Objective: To demonstrate that the number of people with depression and anxiety increase in a Canadian sample from the sub-acute to chronic stages of moderate-severe TBI.
Participants and Methods: Sixty-five patients with moderate-severe TBI were recruited from the in-patient service of a large Canadian acquired brain injury program in an urban hospital. Participants were prospectively and longitudinally assessed for depression and anxiety using the Beck Depression Inventory and Beck Anxiety Inventory at 2, 5, 12 and 24 months post-injury.
Results: While the mean increases in depression and anxiety scores were modest, the number of patients with moderate or greater levels of anxiety and depression increased. Baseline anxiety and depression were above base-rates. Cases of moderate or greater anxiety doubled from 2 to 24 months post-injury, and cases of moderate or greater depression tripled from 2 to 24 months post-injury. The pattern of responding showed a tendency towards reduced somatic and physical symptoms across time, with greater cognitive and affective endorsements.
Conclusions: The number of moderate-severely brain injury people with moderate or greater depression and/or anxiety increases substantively after discharge from in-patient rehabilitation. These findings point to the need to identify risk factors for mood deterioration in the chronic stages of TBI, and to determine treatment platforms and modalities that can reach patients regardless of their geographical location.

Identification of modifiable causes of neurodegeneration in moderate-severe traumatic brain injury
Alexander Terpstra, Brenda Colella, Todd Girard, Jerome Maller, Robin Green
Objectives: To identify possible causes of hippocampal degeneration in moderate-severe TBI.
Participants and Methods: Patients with moderate to severe TBI were recruited from an in-patient acquired brain injury, neurorehabilitation program in a Canadian rehabilitation hospital. In a prospective, longitudinal study, participants underwent comprehensive neuropsychological assessment at 2, 5, 12 and 24 months post-injury, including completion of the Beck Anxiety Inventory, and a self-report questionnaire measuring degree of

cognitive environmental enrichment. Participants underwent quantitative MRI at 5, 12 and 24 months post-injury.
Results: Significant hippocampal atrophy was observed from 5 to 12, and from 12 to 24 months post-injury. Levels of anxiety at 5 and at 12 months post-injury were correlated positively with left hippocampal atrophy from 5 to 12, and from 12 to 24 months post-injury, respectively.
Conclusions: Identification of modifiable causes of brain atrophy in the chronic stages of TBI permits the development of new treatments to improve TBI outcome by preventing hippocampal degeneration. We have previously reported that insufficient cognitive stimulation was associated with increased hippocampal atrophy. Here, we find a second candidate mechanism for hippocampal volume loss, namely elevated anxiety.

Thursday 7th July 2016 Parallel Session E: 14.00 - 15.30

Invited FESN Symposium Session: Neuropsychology research in stroke: from fundamentals to novel applications in assessment and rehabilitation
14.00 - 15.30
Convenor: Nele Demeyere
Speakers: Nele Demeyere, Dario Cazzoli, Céline Gillebert, Martine van Zandvoort, Cathy Price

Domain specific cognitive screening in acute stroke
Nele Demeyere
Abstract: We recently developed the Oxford Cognitive Screen (OCS), a short cognitive screening tool, aimed to briefly assess common post-stroke cognitive problems in 5 domains (Language, Memory, Attention, Number & Praxis). In the first part I will compare and contrast domain specific screening with conducting generalized dementia screens such as MoCA and ACE III. Data will be presented on 300 patients who completed the OCS within 2 weeks of stroke (200 also completed MoCA and 100 ACE III). In the second part, recovery and decline of example cognitive domains will be explored and discussed based on data from 165 follow up assessments.

Non-invasive brain stimulation for the rehabilitation of cognitive deficits after stroke: the case of hemispatial neglect
Dario Cazzoli
Abstract: Left-sided hemispatial neglect is a common and disabling syndrome after a right-hemispheric stroke, and the rehabilitation of neglect still proves to be very challenging. Influential models of neglect conceive this syndrome as the result of impaired dynamics in inter-hemispheric inhibition. Recent studies demonstrated that non-invasive brain stimulation techniques are able to positively influence these dynamics, and thus to lead to an amelioration of neglect symptoms. The present talk will provide an overview on recent advances in the application of non-invasive brain stimulation (in particular, repetitive transcranial magnetic stimulation, rTMS) as a rehabilitative approach for hemispatial neglect, and on open issues in this field, such as the duration of the effects, the relevance for the activities of daily living, and the possible combinations with other rehabilitative approaches.

Lesion-symptom mapping of inattention in acute stroke
Céline Gillebert, Nele Demeyere, Glyn Humphreys
Abstract: 'Attention' is fundamental for every aspect of our cognition: it enables us to stay focused and prioritize the information that is relevant to our task goals,and pervades what we see, think, remember, do and decide. It comes as no surprise that attention disorders are among the most common and devastating stroke-related neuropsychological changes. The most well-known and commonly diagnosed attentional disorder resulting from stroke is hemispatial neglect, a failure to attend to the space on the opposite side of the brain injury. Inattention after stroke may also manifest itself in more subtle ways, impairing the ability to filter out distracting information or concentrate on a task. The interdependence of these attention deficits and their associated neural basis remains unclear. In the present talk, I will review recent large scale lesion-symptom mapping studies aimed at unravelling the neural basis of distinct attention deficits in an unselected sample of stroke patients.

Telling Right from Left
Martine van Zandvoort
Abstract: After stroke the majority of the patients struggle with changes in body image and body schema due to objective and subjective impairments in the sensorimotor domain and this hampers the course of rehabilitation and outcome. In this talk I will focus on the capacity of telling left from right which is of importance in orientation and navigation in daily life. For one, information of the body schema influences left right discrimination. After stroke this capacity can by impaired, e.g. Gerstmann syndrome. However, it is seldom assessed in standard neuropsychological evaluation, and neither frequencies nor cognitive underpinnings are known. We studied 50 subacute stroke patients and 48 healthy controls on the Bergen Right Left Discrimination Task next to subjective and objective measures of somatosensory functioning and standard neuropsychological work up. How subjective feelings of insecurity to one's own bodily awareness after stroke can influence mental rotation abilities and its possible consequences for rehabilitation will be discussed.

Predicting Language Outcome and Recovery after Stroke
Cathy Price
Abstract: Stroke survivors with aphasia want to know if and when they will recover but it is difficult to make these prognoses because so many factors are thought to influence recovery from aphasia. For decades, it has been assumed that knowing the location of brain damage is not sufficiently informative to predict future outcome. This doubt followed observations that patients could have damage to the same brain region (e.g. Broca's area) but have different symptoms and recoveries. We are now striving to change this belief. What we have shown is that the effect of damage to one brain region depends on whether other regions are available to support the same function. This is like saying that the effect of losing one finger depends on how many other fingers have also been damaged. Once we take this basic assumption into account, we show how we can predict not only who will have long term speech production difficulties but also which patients are most likely to recover. Confident predictions can then be used by patients to plan their futures, and by clinicians to direct the patients to the therapies and interventions that are most likely to help them.

Student Symposium Session: Aspects of anosognosia and the self
14.00 - 15.30
Convenor: Coco Bernard
Discussant: Daniel Mograbi
Speakers: Daniel Mograbi, Valentino Moro, Robin Morris, Stephanie Cosentino

Perspective taking and awareness of cognitive performance in Alzheimer's disease
Elodie Bertrand, Robin Morris, J. Landeira-Fernandez, Daniel Mograbi
Objective: People with Alzheimer's disease (AD) are often unable to appraise accurately their performance during neuropsychological testing. Despite these difficulties, clinical anecdotes suggest that they are able to evaluate the performance of others.
Participants and methods: 21 patients with mild to moderate AD and their caregivers took part in the study. The patients and their caregivers completed a series of computer tasks with controlled levels of difficulty; Experiment 1 used reaction time tasks and Experiment 2 used memory tasks. In each experiment, there was an easy task (performance controlled at 90% of success) and a very hard task (performance controlled at 10% of success). Patients had to rate the level of performance for themselves and their caregivers after each task.
Results: The experimental control of task difficulty was successful, with patients and caregivers showing similar levels of performance. Results confirmed previous findings of AD patients overestimating performance after failure but underestimating it following success. In Experiment 1, patients were more accurate about performance of their caregivers during the success tasks. In Experiment 2, there was an overall trend for patients being more positive about performance of their caregivers, regardless of task difficulty.
Conclusions: The findings suggest that patients with AD appraise the performance of their caregivers differently, despite both groups

performing at the same level. This might reflect reliance on general semantic knowledge when appraising others, also pointing to the possibility of residual awareness abilities. Rehabilitation efforts may benefit from presenting information to AD patients on a third-person perspective.

Awareness of Cognitive Deficits and Clinical Competence in Mild to Moderate Alzheimer's disease
Valentina Moro
Objective: In clinical practice, clinical competence (CC) and awareness of cognitive deficits are often considered to be associated. However, to date conclusive data regarding this relationship are meager. We will discuss the results from three studies involving large groups of patients suffering from Alzheimer's Disease.
Methods: Anosognosia was investigated by means of the AQ-D while CC was assessed with neuropsychological tests in one study and with specific ad-hoc devised tools including text comprehension and reasoning in another study.
Results: Our results indicate that the two functions are dissociated and need to be assessed using specific instruments. In addition, we found that both anosognosia and CC disorders may be present from the very first stages.
Conclusions: The development of specific tools is necessary in order to monitor the patient's real ability to take decisions in a clinical context and the evolution of the symptoms.

'The Seven Selves' and their use in Making Sense of the Experience of Dementia
Robin Morris, Daniel Mograbi
Objective: Despite the lack of a consistent definition of the self, it is undeniable that we experience the world from a first person perspective. Recent perspectives have emphasised the existence of multiple self-processes, with neurological and psychiatric conditions having a potential impact on selfhood. The paper reviews different conceptualisations of 'self' and how this can be applied to understanding the experience of having dementia.
Methods: Seven different aspects of selfhood and their interaction in people with dementia are explored, namely critical, petrified, surrogate, embodied, extended and implicit, petrified and surrogate.
Results: These different aspects of the person are found to map on to taxonomies of neurocognitive functioning, in particular declarative versus procedural memory systems, and links between these self-processes and awareness of condition can be drawn.
Conclusions: Concepts associated with self are still relevant to understanding dementia and can be linked to specific neurocognitive systems.

Metacognition and self awareness in Alzheimer's Disease
Stephanie Cosentino
Objective: The vast majority of patients with Alzheimer's disease (AD) suffer from severe memory loss; however, only about half of patients with mild to moderate AD appear to be aware of their memory loss. Disordered memory awareness, conceptualized here as a specific impairment in metacognition, is a striking and consequential disease feature that threatens patient safety and increases caregiver burden. This presentation focuses on the relationship between impaired metacognition and selfhood in AD.
Methods: This presentation reviews a series of studies that have merged metacognitive, neuropsychological, and epidemiological methodologies to understand the etiology, nature, and consequences of disordered self awareness in AD.
Results: Accumulating evidence suggests that metacognitive impairment in AD is distinct from cognitive impairment, reflects a specific distribution of neuropathology, and may reflect impaired detection of memory failures.
Conclusions: Based on the existing evidence, clinical and theoretical implications are discussed, with particular attention given to how the care of people with AD might be improved based on our current knowledge about metacognitive processing in this group.

Symposium Session: Cross-cultural neuropsychology: A South Asian perspective
14.00 - 15.30

Convenor: Narinder Kapur
Discussant: Barbara Wilson
Speakers: Narinder Kapur, Ratnavalli Ellajosyula, Farzana Mulla, Aparna Dutt, Suvarna Alladi

Cross-Cultural Neuropsychology - An Overview
Narinder Kapur
Abstract: Minority and ethnic populations throughout the world represent a challenge for the discipline of Neuropsychology, partly due to their unique cultural, educational and language background, and partly because most neuropsychological tests were developed in western countries and standardized with western populations. Research has highlighted under-diagnosis or late-diagnosis of dementia in some BME communities. A recent House of Commons Report highlighted the challenges faced by ethnic minorities who suffer from dementia. Recent research has shown the value of using specially-constructed neuropsychological procedures in the detection of dementia in South Asian patients who are seen in memory clinic or related settings. Diseases, such as some forms of dementia, may present in a different fashion in the South Asian population for social and cultural reasons, as has been shown in the case of frontotemporal dementia. India has one of the highest rates of stroke in the world. With its large population, overseas presence of a major diaspora and the high prevalence of English as a second or first language, South Asian countries such as India form an ideal base from which to carry out cross-cultural neuropsychological studies. In the neuropsychological assessment of ethnic populations, simply translating a test from English to another language is quite inadequate. Researchers in India have carried out pioneering work in developing or adapting tools that can help in the assessment and rehabilitation of non-western neurological patients, and in offering unique perspectives on issues such as cognitive reserve, bilingualism and dementia.

Bilingualism and dementia: The vulnerable second language
Ratnavalli Ellajosyula, Jwala Narayanan, Siddarth Ramanan, Nidhi Dev
Objective: To study language profiles in multilingual patients with Alzheimer's disease (AD), behavioural variant Frontotemporal dementia (bvFTD) and semantic dementia (SD). The study also explores if there is differential decline in secondary languages and the role of language proficiency.
Participants and Methods: All patients had clinical assessment, neuropsychological testing and neuroimaging. Spontaneous speech was assessed using the Western Aphasia Battery. Syntactic comprehension and reading were tapped using the Bilingual Aphasia Test. Naming was tested by a version of the Boston naming test adapted for Indian patients. Assessment was conducted in the primary language (L1) first, followed by neuropsychological testing and then by assessment in the second language (L2).
Results: Naming in L2 was impaired in patients with AD and SD, compared to controls and bvFTD patients. Phonemic fluency was better in English for controls, even if they were less proficient in English. However, this advantage was lost in patients with dementia, particularly AD and SD. Patients with SD showed a marked deterioration of L2 at presentation, with scores at floor on most tests.
Conclusions: Later languages (L2) are lost early in SD. L2 appears to deteriorate faster compared to L1 in AD, suggesting increased vulnerability of L2 to brain degeneration. Language proficiency does not appear to determine verbal fluency performance in bilingual patients.

Neuropsychological Rehabilitation: Challenges and Opportunities in a South Asian setting
Farzana Mulla
Abstract: Neuropsychological rehabilitation in South Asian countries such as India presents a unique set of challenges and opportunities. Five clinical cases are presented which illustrate some of these opportunities and challenges. This talk will describe three cases of HIV-related CNS infection, one case of TBI and one case of subarachnoid haemorrhage. On the basis of rehabilitation intervention in these cases, the western model of rehabilitation was found to be broadly applicable to an Indian context, and we were able to include features such as goal setting and behavioral measurement in the rehabilitation programme. All of the cases showed meaningful improvements following rehabilitation. However,

we were also able to document unique challenges for neurorehabilitation in Indian settings. Working with family members and dealing with family dynamics is critical, perhaps more so than in the west, since joint family systems are much more common in India. Understanding and addressing cultural beliefs, especially in relation to herbal, homeopathic and spiritual remedies, is often a key component of a neurorehabilitation programme. Simplistic expectations of a ready 'cure' for neuropsychological disabilities also need to be addressed. By means of a formal psycho-education programme, we were able to tactfully challenge and change beliefs held by some families that the patient is 'mad, mentally retarded or possessed', and to document this with relevant outcome measures. Finally, while limitations in resources present additional challenges and opportunities to improvise, we found that mobile phone technology can be usefully exploited to help with parts of a neurorehabiltation programme.

Complex visual processing differences across cultures: Evidence from a cross-cultural study of the Visual Object and Space Perception Battery
Aparna Dutt
Objective: To compare performance on the Visual Object and Space Perception (VOSP) battery of a healthy Indian cohort with cohorts from the US, UK, Spain, & Greece.
Participants & Methods: The performance of 200 healthy Indian individuals was compared with age matched healthy British (n=350), American (n=111), Spanish (n=570) and Greek (n=130) samples on the VOSP. Standard administration procedures were followed except for the Indian sample on the Silhouettes subtest where the discontinuation principle was not followed and for the Object Decision subtest in which participants had to name items in addition to pointing to the correct stimulus.
Results: The Indian cohort had significantly higher years of education than the other groups, but performed significantly worse on Silhouettes, Object Decision and Progressive Silhouettes. Cut-off scores were therefore lower in the Indian sample. An item analysis indicated that the Indians failed to recognize culturally 'alien' objects, but also failed to recognize animals and objects judged to be culturally familiar. Two types of errors on the Object Decision test ('correctly identified but wrongly named' and 'mistaking an unreal object for the real one') may be artifacts arising from misidentification of items because of similarity with real items in Indian culture. The Indians were either better or comparable on the spatial subtests.
Conclusions: Variations in perceptual processing style may explain differences in performance between Indians and participants from Western cultural contexts, over and above any lack of cultural familiarity with individual test items. This has serious implications for cross-cultural test adaptation.

Vascular dementia in an Indian setting: Risk and protective factors and challenges in harmonising research
Suvarna Alladi, Subhash Kaul
Abstract: Vascular Dementia is the second leading cause of dementia globally. It is likely that the exact burden is underestimated due to lack of recognition of milder forms of cognitive impairment and a limited understanding of the entire range of the disorder. There is therefore a need to understand risk and protective factors for the disease and to develop sensitive and validated tools for comprehensive diagnosis
Since the distribution of lesions is not uniform in vascular dementia, the profile of cognitive deficits is also heterogeneous. A combination of deficits ranging from mild to severe attention/executive dysfunction, memory, language, visuospatial and praxis deficits and also behavioural and social cognition deficits occur. Cognitive assessment is further difficult due to the frequent association of motor deficits. A Vascular Cognitive Impairment harmonisation protocol has been developed that recommends the use of sensitive diagnostic criteria and a standardised neuropsychological test protocol that can be used across different populations. Heterogeneity of educational status and multitude of languages in India make adaptation of the Vascular Cognitive Impairment protocol challenging. In this paper, we report the profile of cognitive deficits encountered in a large registry of patients evaluated comprehensively in a Stroke and Memory clinic in India. The results of adapting and validating a uniform cognitive battery for vascular dementia in several Indian languages and across different educational levels will be discussed. We will also discuss the potential role of cognitive reserve related to education and bilingualism in protecting against the development of cognitive impairment due to cerebrovascular disease.

Oral Presentation Session: Memory 14.00 - 15.30

Interference and decay in spatial memory in Korsakov patients
Albert Postma
Objectives: Memory interference refers to situations where different memory traces compete with each other. It might be one of the most critical causes for memory failure. In the present paper distinct forms of interference were examined in Korsakov patients.
Participants and Methods: Seventeen Korsakov patients and 18 age matched controls participated. In a spatial memory paradigm participants studied several objects on different locations after which they had to relocate the objects. This was followed by a trial in which the same objects had to be learned but now associated with new locations (proactive interference/ negative transfer). Subsequently, retrieval of the original object locations was re-tested (retroactive interference). Multiple trial sequences were presented. In some of them no intervening trial was given. Hence the effect of 'decay' could be tested.
Results: Patients had overall poor spatial memory ($F(1, 32) = 96.27$, $p < .001$) with distinct patterns of interference ($F(2.31, 73.99) = 5.09$, $p < .01$). Stronger decay was in the Korsakov group.
Conclusions: Korsakov patients have poor object location memory (context deficit hypothesis). Like healthy controls they suffer difficulties in learning new locations for old objects (negative transfer) and in retrieving old locations when new location memories have been formed (retroactive interference). However in terms of relative change against baseline this seems less strong in patients. Possibly the fact that controls have stronger recent memory traces causes relatively higher interference. In turn, decay appears a more prominent cause for forgetting in Korsakov patients.
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Call me later: Using a naturalistic prospective memory task to measure everyday behaviour
Jessica Fish, Fergus Gracey, Jon Evans, Andrew Bateman, Donna Malley, Barbara A. Wilson, Tom Manly
Background: Rehabilitation aims to effect behavioural change over long time periods. There is hence an argument against measuring outcomes using cognitive tests. However, it is hard to measure everyday behaviour in a psychometrically robust way that remains meaningful to the individual. Here we present a measure that aims to satisfy both objectives. Specifically, we examine the validity of a naturalistic prospective memory (PM) task, the phone call task, where participants make repeated phone calls at set times in the course of their daily activities.
Participants and Method: We collected data from 72 adults (46 males; age48.4±14.1 years) with ABI (31 TBI, 25 stroke, 16 other) on a range of measures: the phone call task, attainment of participant-defined goals (e.g. spending time on hobbies, remembering belongings), and achievement of other goals not defined previously ('spontaneous' goals). Data were collected over two weeks, in the baseline phase of an intervention trial. A small neuropsychological test battery was also administered.
Results: Phone call accuracy was significantly associated with participant-defined goal attainment. It was not, however, associated with 'spontaneous' goal achievement. Phone call accuracy was not associated with neuropsychological test performance; however, multitasking and sustained attention scores were associated with participant-defined goal attainment, and sustained attention with the achievement of spontaneous goals.
Conclusions: The phone call task is an effective proxy measure of everyday goal attainment. This method could be useful in measuring the impact of rehabilitation in both experimental and clinical settings, and as a measure of far transfer.
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Material specific MTL and extra-MTL responses supporting recognition memory: Interactions between stimulus content and memory kind
Alex Kafkas, Ellen Migo, Robin Morris, Michael Kopelman, Daniela Montaldi, Andrew Mayes
Objective: An fMRI study explored whether medial temporal lobe (MTL) and connected extra-MTL structures responded in the same way or differentially to familiarity and recollection as a function of stimulus type at recognition.
Participants and Methods: The experiment adopted a mixed event-related/block design combining three types of pictorial stimuli: objects, faces and scenes. Nineteen participants encoded these three stimulus types and later in the scanner they were asked to rate feelings of familiarity for each stimulus and report any instances of recollection. Complementary univariate and multivariate pattern classification analyses were applied to the data.
Results: Familiarity-based recognition responses within the MTL were found to be material-specific, with the perirhinal cortex responding to object familiarity and the parahippocampal cortex to both object and scene familiarity. The amygdala was found to have a selective role in familiarity-based recognition for faces, whereas the adjacent hippocampus did not respond to stimulus familiarity for any of the three types of stimuli. In contrast, the hippocampus was found to have a non-stimulus selective role in recollection, even when compared to strength-matched familiarity. Finally, the dorsomedial thalamus showed a material-independent role in familiarity-based recognition, whereas the anterior thalamus only responded to recollection.
Conclusions: These findings point towards a degree of specialization, with respect to stimulus type, within the MTL cortices and the extended MTL network during familiarity-based recognition. They also have important implications for current theories of recognition memory and for evaluating the extent of functional specialization within the MTL.
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Episodic memory and parietal cortex: Relationship between egocentric visual spatial representation and quality of recall
Charlotte Russell, Adrian Williams, Sarah Davies, Anna Sofia Musil, Paresh Malhotra
Objective: Although there is evidence from functional imaging for parietal lobe involvement in episodic memory, there has been no definitive explanation of this area's precise role. We hypothesised that parietal regions play a crucial part in episodic memory, specifically in recollecting details from an egocentric visual perspective.
Participants and Methods: We designed a novel task utilising a head-mounted camera to record images from the participants' perspective, enabling us to evaluate the integrity of memory from the individuals' own viewpoint. In the first study healthy participants performed the task in the fMRI scanner. In the second, patients with parietal damage were compared to healthy controls. Finally, we examined the relationship between our paradigm and established measures of autobiographical memory veracity.
Results: Areas frequently activated in fMRI studies of episodic memory were recruited when participants had to differentiate their own versus another's viewpoint of encoded scenes. Second, although parietal patients were unimpaired in standard episodic tasks a specific deficit was revealed when they attempted to judge from which perspective they had viewed the scenes. Finally, the ability to correctly identify personal perspective in our paradigm correlated with performance on an autobiographical memory interview adapted from Piolino et al (2009).
Conclusions: Our results provide evidence that parietal cortex is directly involved in egocentric perspective aspects of episodic memory and that this visual-spatial characteristic of memory relates directly to the level of detail provided in spontaneous autobiographical recall. Further, we demonstrate a specific deficit in episodic memory in patients with parietal damage.
Correspondence: *Charlotte Russell, King's College Institute of Psychiatry, charlotte.russell@kcl.ac.uk*

Errorless skill acquisition in Korsakoff's syndrome
Erik Oudman, Tanja C.W. Nijboer, Albert Postma, Stefan Van der Stigchel
Objective: Patients with Korsakoff's syndrome (KS) show devastating anterograde amnesia and executive deficits. Consequently, the ability to perform instrumental activities such as making coffee is frequently diminished. Errorless learning (EL) is a teaching technique that uses feed-forward instructions, preventing mistakes during the learning process. Recent evidence suggests that EL may be beneficial for patients with severe explicit memory problems compared to trial-and-error learning (TEL). It is currently unknown whether EL is successfully applicable for (re)learning instrumental activities in KS. The aim of the present study was to examine whether EL is an effective method for (re)learning an instrumental activity in KS, namely using a washing machine to do the laundry.
Participants and Methods: In the present experiment KS patients performed a laundry task by means of EL (n=8) or TEL (n=8). The experiment included eight learning sessions, four follow-up sessions after four weeks without practice and a session in a different context.
Results: Both intervention techniques resulted in similar improvement over eight learning sessions. Performance in a different context also improved. Importantly, in follow-up sessions after four weeks without practice, performance was still elevated in the EL condition, but not in the TEL condition.
Conclusions: This study demonstrates that (re)learning and maintenance of an instrumental activity of daily living is possible in patients with KS. EL was more effective for maintaining the instrumental task than TEL.
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Specific alterations of thalamic nuclei in alcoholics with and without Korsakoff's syndrome: a Diffusion Tensor Imaging (DTI) investigation
Shailendra Segobin, Ludivine Ritz, Coralie Lannuzel, Céline Boudehent, François Vabret, Francis Eustache, Hélène Beaunieux, Anne-Lise Pitel
Objective: The thalamus is a relay organ shared between the frontocerebellar circuit (FCC) and the Papez circuit (PC), both circuits being particularly affected in alcoholism. Our aim is to examine how thalamic nuclei connected to key regions of the FCC and PC are altered in terms of volume and connections in alcoholics with and without Korsakoff's syndrome (KS and AL respectively).
Participants and methods: 16 healthy controls (HC), 26 AL and 7 KS underwent a DTI sequence and a T1-weighted MRI. Probabilistic tractography was used to segment the thalamus according to the brain regions they are connected to (prefrontal cortex, cerebellar crus and lobs, precentral gyrus for FCC; hippocampus for PC). The connectivity (number of fibre tract samples) and volumes of these segmented thalamic nuclei were calculated.
Results: We found significant differences on connectivity measures for thalamic nuclei connected to the hippocampus only (AL< HC and KS< HC). Regarding the volumes of thalamic nuclei, significant differences were essentially observed for the nuclei connected to the prefrontal cortex and the hippocampus (prefrontal: AL< HC and KS< HC; hippocampus: KS< HC).
Conclusions: Volumetric and connectivity measures of thalamic nuclei suggest two different mechanisms affecting the thalamus, depending on the connections of the nuclei to the FCC or the PC. The first involves atrophy of the nuclei connected to the prefrontal area as the leading factor while the second is dictated by disconnection of the nuclei connected to the hippocampus. Correlations with neuropsychological scores and alcohol drinking history were also carried out and will be discussed.
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Friday 8th July 2016 Parallel Session F: 08.30 - 10.00

Invited Symposium Session: Treating fatigue and sleep disturbance following brain injury with cognitive behavioural therapy
08.30 - 10.00
Convenor and Discussant: Jennie Ponsford
Speakers: Jennie Ponsford, Sylvia Nguyen, Dana Wong, Adam McKay

Fatigue and sleep disturbance following brain injury
Jennie Ponsford
Abstract: Fatigue and/or sleep disturbance are reported by a significant proportion individuals with traumatic brain injury (TBI), across the spectrum of injury severity, often co-existing. They have a significant impact on participation in daily activities and quality of life, and are associated with depression and anxiety. This presentation will provide an overview of recent studies identifying the nature, causes and time course of fatigue and sleep disturbance following brain injury. The implications of these findings for management of fatigue and sleep disturbance following TBI will be discussed.

Cognitive Behaviour Therapy to treat Fatigue and Sleep Disturbance Following Acquired Brain Injury: A Pilot Randomised Study
Sylvia Nguyen, Jennie Ponsford, Adam McKay, Dana Wong, Shantha Rajaratnam
Objective: Fatigue and sleep complaints are common sequelae of brain injury (ABI), for which there are no established treatments. This study aimed to evaluate the efficacy of Adapted CBT for fatigue and sleep disturbance in individuals with ABI.
Participants and methods: 34 participants with history of traumatic brain injury (TBI) or stroke and clinically significant fatigue and/or sleep difficulties were randomly allocated to either an eight-session Adapted CBT intervention or treatment as usual (TAU). Participants were assessed at baseline, two months (post-treatment) and four months post-randomization. The primary outcomes were sleep quality and fatigue severity. Secondary measures included insomnia, fatigue impact, depression and anxiety.
Results: When analysed as one sample, CBT participants reported significantly better sleep quality and reduced insomnia than those receiving TAU. Further investigation revealed robust improvement in sleep quality in the TBI cohort (PSQI mean difference 4.98, 95% CI: 2.53 to 7.43) but greater change in fatigue severity for the stroke cohort (FSS mean difference of 1.93 95% CI: 0.81 to 1.76). Secondary improvements in mood were noted for both groups. Large within-group effect sizes were evident across measures (hedges g = 0.98 - 2.43) with maintenance of gains two months after therapy cessation. In sum, adapted CBT resulted in greater and sustained symptom improvement over TAU although there were subtle differences in treatment response between TBI and stroke.
Conclusions: TBI participants demonstrated changes in sleep, fatigue impact and depression while fatigue severity; anxiety and depression were alleviated in the stroke group.

Cognitive Behaviour Therapy to Alleviate Fatigue following Acquired Brain Injury: Illustrative case examples
Dana Wong, Adam McKay, Sylvia Nguyen, Shantha Rajartatnam, Jennie Ponsford
Ojectives: Fatigue is one of the most pervasive and persistent consequences of brain injury and has a significant functional impact. Results from our pilot randomised controlled trial suggest that for people with TBI, CBT is effective in reducing the impact of fatigue on daily life, but not for reducing the overall severity of fatigue symptoms. However, in stroke, there appears to be a stronger improvement in fatigue severity. This presentation will outline the Adapted CBT approach to treating fatigue, and illustrate its process and outcomes using case examples. Possible explanations for the different pattern of results in participants with TBI and stroke will also be explored.
Participants and Methods: Two case studies will be presented, both men of similar age (49 and 50 years) presenting with fatigue; one of whom had suffered a TBI, and the other of whom was a stroke survivor.
Results: These men both demonstrated typical cognitive and behavioural patterns that occur in response to ABI-related fatigue on a background of previously highly active lifestyles. Fatigue treatment modules from the Adapted CBT program they received included psychoeducation and goal setting, activity scheduling (including scheduling of regular rest breaks), cognitive restructuring, relaxation exercises, and strategies for minimising physical and mental fatigue. Delivery of these modules was adapted to compensate for cognitive difficulties. Both cases showed a positive response to CBT that exemplified the typical outcomes in our participants with TBI and stroke.
Conclusions: Fatigue following ABI may be successfully treated with Adapted CBT

Cognitive Behaviour Therapy to Address Sleep Disturbance Following Acquired Brain Injury: Illustrative case examples
Adam McKay, Dana Wong, Sylvia Nguyen, Shantha Rajaratnam, Jennie Ponsford
Objectives: Cognitive Behaviour Therapy for insomnia (CBT-I) is an effective treatment in the general population, and our recent pilot randomised controlled trial (RCT) suggests an adapted version can also be effective for treating sleep problems in clients with ABI. In this presentation we outline the sleep intervention and discuss how it was adapted for clients with ABI using illustrative case examples.
Participants and Methods: Two illustrative case examples are drawn from 34 participants with acquired brain injury who completed the RCT treating sleep and fatigue difficulties. The intervention was delivered using a CBT framework across 8 sessions and included modules targeting sleep and fatigue difficulties shown effective in other populations and adapted to better suit clients with acquired brain injury. The sleep treatment modules included sleep education, relaxation training, stimulus control therapy, bedtime restriction therapy, sleep hygiene, and cognitive therapy.
Results: These interventions helped to develop more adaptive sleeping behaviours and beliefs and lead to improved sleep quality, mood, and overall function when assessed on standardised measures.
Conclusions: Both behavioural and cognitive components of the CBT appeared important in improving sleep while the delivery of the intervention required some adaption to compensate for cognitive impairments, particularly memory difficulties and executive dysfunction.

INS International Liaison Committee Symposium: Cross-cultural adaptation of neuropsychological tests - issues, challenges and solutions
08.30-10.00
Convenor: Jonathan Evans
Discussant: Lisa Drozdick
Speakers: Alberto Fernández, Aparna Dutt, Parisuth Sumransub, Srinivasan Jayaraman, Leire Zubiaurre

Neuropsychological Test Adaptation and Development in Argentina
Alberto Fernández
Objectives: Over the last 25 years neuropsychology has experienced outstanding growth in Argentina, particularly in relation to development of neuropsychological assessment tools. Initially the approach was adaptation of classical neuropsychological tests developed in other regions. However, significant problems arose with simple translations of traditional tests, and therefore new tests were developed. This is illustrated with reference to studies of a Spanish version of the Boston Naming Test (SV-BNT) and a new test, the Cordoba Naming Test (CNT), which was designed to be more culturally appropriate to the Spanish-speaking context of South America.
Participants and Methods: The SV-BNT was administered to 23 patients with Alzheimer's disease (AD) and 36 normal controls matched for age and education. The CNT was administered to a sample of 23 AD patients and an age, gender and education-matched group of 26 controls, with reference to a larger normative sample of 456 controls.
Results: For the SV-BNT, although there were group level significant differences, sensitivity was poor at 39%. By contrast, for the CNT there was a large statistically significant difference between the patients and controls, with 74% sensitivity and 77% specificity.
Conclusions: It is critical that tests are adapted to the cultural context in which they will be used. Important areas in neuropsychological testing still need to be developed in Argentina, particularly pediatric neuropsychological tests, tests of memory, executive functioning and attention, and batteries designed for public health contexts. This context is characterized by limited financial resources and a population which is typically less educated.

Behavioural variant Frontotemporal Dementia: A South Asian perspective

Aparna Dutt
Abstract: This talk describes how behavioural frontotemporal dementia (bvFTD) in Indian patients differs in clinical presentation and genetic factors compared to what is seen in the west. Patients who met core criteria for bvFTD underwent detailed neurological evaluation, neuropsychological testing and brain imaging. The presence of abnormal C9orf72 hexanucleotide repeat expansion was also explored. Our key findings were as follows. Firstly, (a) environmental dependency behaviours such as incidental utilization behavior was seen in the majority of cases and (b) imitation behavior were seen in 59% of our bvFTD patients. This stands sharply in contrast to the lower incidence reported in the western literature. Secondly, even though around 84% of bvFTD patients showed changes in eating behavior early in the course of the illness, individual eating behavior abnormalities were much less frequent than those reported in UK samples. Thirdly, most of our patients presented with moderate to severe dementia, in spite of having a relatively short onset to diagnosis times (2.9 ±1.6) years. Patients on average took 1.4 years from onset to meet the FTD criteria, with 90% of them presenting with four or more symptoms at diagnosis. Fourthly, only 9.5% of bvFTD patients had a family history of any FTD spectrum disorder. Fifthly, C9orf72 mutation was absent in our sample of Indian FTD patients. In summary, cross-cultural differences exist in respect of environmental dependency and eating behaviours in bvFTD patients. Genetic factors appear to be less prevalent in non-western samples of bvFTD patients such as those included in this study.

Validity of the Thai BIRT Memory and Information Processing Battery (BMIPB) in the assessment of dementia
Parisuth Sumransub, Jonathan Evans
Objective: There are no culturally adapted test batteries available for the assessment of memory in Thailand. We adapted the BMIPB to be linguistically and culturally appropriate in a Thai context and examined its validity in the assessment of memory in patients with mild cognitive impairment (MCI) and Alzheimer's disease.
Participants and Methods: The BMIPB was translated and adapted into Thai taking account of the cultural context. The verbal tests, Story Recall and List Learning, were modified substantially, whilst aiming to remain consistent with the original underlying constructs. The nonverbal tests, Figure Recall and Design Learning, were unchanged. Thirty subjects with early stage Alzheimer's disease and 18 subjects with MCI were diagnosed by neurologists/psychiatrists blinded from Thai-BMIPB results. Their performance was compared with 20 age and education-matched controls. Analysis compared the controls with a combined group of MCI/AD patients.
Results: There were significant differences on the Thai-BMIPB between dementia and non-dementia groups across all subtests including the Story Immediate Recall ($r = -.39$, $p = .004$), Story Delayed Recall ($r = -.46$, $p = .004$), Figure Immediate Recall ($r = -.44$, $p = .001$), Figure Delayed Recall ($r = -.53$, $p < .001$), List Learning Immediate Recall ($r = -.57$, $p = .001$), List Learning Delay Recall ($r = -.61$, $p = .001$), Design Learning Immediate Recall ($r = -.33$, $p = .015$).
Conclusions: Initial results suggest that the Thai-BMIPB is a valid neuropsychological instrument for detecting memory problems in a Thai-context. Large-scale normative data collection is underway

Validation of the 'Dice Test' as a measure of information processing speed in people with traumatic brain injury: a preliminary investigation
Srinivasan Jayaraman, Jonathan Evans
Objectives: Information processing speed (IPS) refers to the speed by which individuals perform cognitive tasks. IPS is distinguished from motor speed although speeds of cognitive and motor processes are often conflated in clinical assessment tools. The BIRT Memory and Information Processing Battery Speed of Information Processing (BMIPB SoIP) test controls for motor responses when evaluating speed of cognitive processing. However this test is not suitable for use with people who are illiterate, which represents a significant proportion of the population in India. This study evaluated the validity of a version of the BMIPB SoIP designed for use with people with low literacy skills (referred to as the DICE test).
Participants and Methods: Thirty literate people with head injuries ranging in severity from mild to severe, from two hospitals in Tamil Nadu, India, participated in the study. The study examined the correlation in performance between the original and adapted (Dice) forms of the BMIPB SoIP, the WAIS-IV-Symbol Search, and WAIS-IV-Coding.
Results: Performance on the Dice test correlated significantly with performance on the original BMIPB SoIP, and all of the other speed test scores. A negative correlation was found between length of post-traumatic amnesia and performance on all four tests. No effects of age and education were observed.
Conclusions: This study provides initial evidence that the Dice test may be a useful alternative for the assessment of IPS in people with low literacy. Further studies with illiterate participants are planned.

NORMACOG Project: Normalization of Neuropsychological Test in the Spanish Population
Natalia Ojeda, Rocío Del Pino, Naroa Ibarretxe, David Schretlen, Javier Peña
Objective: Normalization of tests materials in Spain has been limited in both the number of tests and the participants included in the studies. We present the NORMACOG project, codirected by University of Deusto and Johns Hopkins Medical Institutions, in which 19 neuropsychological instruments were translated, standardized and normed in Spain.
Participants and Methods: The instruments included: NART, TMT A & B, Grooved Pegboard Test, Salthouse Perceptual Test, Cognitive Estimation Test, Brief Test of Attention, CIFA, Boston Naming Test, Lawton´s ADL, Prospective Memory Test, MoCA, CIFA, Taylor Complex Figure Test, Stroop Test-Modified, and Wisconsin Card Sorting Test- Modified.
Seven hundred participants were recruited from eight different geographical regions. Age range was 18-90 and there was equal representation of subjects in three levels of education for each age division. The general characteristics of the sample were defined and matched with the Spanish Institute of Statistics (INE) data on the Spanish general population.
Results: The instructions for the administration of the tests, their adaptation, and results are being published in a series of open access peer reviewed articles to make data as accessible as possible to both researchers and clinicians. In addition to the description of the project and the data, we will present a regression based norm (RBN) method to estimate individualized scores adjusted to premorbid IQ.
Conclusions: The RBN method provides more accurate normative data, facilitating interpretation of an individual's performance. This study highlights the need for large-scale programs of test standardization and normative data collection in non-English speaking countries.
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Oral Presentation Session: Dementia and Neurodegeneration 08.30-10.00

A longitudinal study of dual task abilities in preclinical familial Alzheimer's disease
Sarah E. MacPherson, Sonia Moreno, Mario Parra, Francisco Lopera, Sergio Della Sala
Objective: Patients with sporadic Alzheimer's disease (AD) are impaired in their ability to perform two tasks simultaneously compared to healthy younger and older adults, despite being able to perform the tasks on their own relatively well. More recently, our work has shown that dual task impairments are also found in individuals at 100% risk of developing familial AD due to an E280A presenilin-1 genetic mutation but who do not yet meet the criterion for AD. Therefore, the dual task paradigm may be a clinical marker for the early detection of AD. This study investigates the longitudinal evolution of dual tasking in preclinical AD carriers.
Participants and methods: Thirty-five individuals who tested positive for the genetic mutation for early onset familial AD but who did not yet meet the criteria for AD were asked to perform the dual task paradigm, as well as episodic memory measures, at baseline and then 1 and 2 years later. **Results:** While the preclinical AD carriers showed a significant decline in overall dual task performance over the 2 year period, a similar significant decline was not found on the majority of the episodic memory tasks.
Conclusions: These findings provide support for the notion that a deficit in the coordination mechanism of the central executive may be

a clinical marker for the early detection of AD due to the E280A presenilin-1 gene mutation.
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Clinical versus statistical prediction: the case of Parkinson's disease dementia
Ben Schmand, Dino Muslimovic, Mark Broeders, Daan Velseboer, Rob de Bie
Objective: Mild cognitive impairment in patients with Parkinson's disease (PD-MCI) is considered to be the stage preceding Parkinson's disease dementia (PDD). Therefore, the PD-MCI diagnosis should be highly predictive of PDD. We examined whether the PD-MCI diagnosis had better predictive accuracy for PDD than a purely statistical criterion of cognitive abnormality.
Participants and Methods: At baseline, 123 newly diagnosed PD patients and 70 demographically matched healthy controls were given 10 neuropsychological tests (two tests in each of five cognitive domains). The patients were diagnosed as having PD-MCI or as cognitively normal. Using the same 10 tests, the entire score profile of each individual patient was tested against the scores of the control group by the method of multivariate normative comparison (MNC; Huizenga et al. Neuropsychologia, 2007).
Results: Forty-three patients had PD-MCI, while 33 patients were classified as cognitively abnormal by MNC. PD-MCI predicted PDD after three years with an odds ratio of 8.1 (90% CI: 2.0-32), which decreased to 5.0 (1.9-13) and 2.2 (0.9-5.1) after five and eight years, respectively. Abnormal cognition by MNC predicted PDD with ORs of 6.6 (1.9-22), 7.2 (2.6-19) and 3.8 (1.6-8.9) at three, five and eight years, respectively.
Conclusions: Prediction of conversion to dementia within eight years in Parkinson patients is equally accurate on the short run, whether based on clinical PD-MCI criteria or on a statistical criterion (abnormal cognition by MNC). On the long run, however, PD-MCI quickly loses predictive accuracy, whereas the statistical criterion maintains more accuracy.
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The functional impact of computer versus compensatory training in mild Cognitive impairment
Melanie Chandler, Dona Locke, Noah Duncan, Sherrie Hanna, Andrea Cuc, Julie Fields, Charlene Hoffman-Snyder, Angela Lunde, Glenn Smith
Objective: This pilot study examined the impact of a restorative cognitive rehabilitation strategy (computerized training) compared to a compensatory rehabilitation strategy (calendar training) in Mild Cognitive Impairment (MCI). Results from this study are part of an ongoing, larger multimodal behavioral intervention program in MCI (HABIT Healthy Actions to Benefit Independence & Thinking) that includes both the computerized and calendar training as well as an educational series, supportive group therapy, and physical wellness training through yoga.
Participants and Methods: Sixty-four individuals with amnestic MCI were randomized to calendar or computer training. All participants also received an educational course on MCI and healthy brain habits. A standard care control group was used for comparison. Measures of adherence, memory-based activities of daily living (mADLs) and memory self-efficacy were completed. We estimated effect sizes and sample sizes needed to attain significance for use in future trials.
Results: The calendar training group demonstrated significant improvement in mADLs compared to controls, while the computer training group did not. Additional analyses had moderate effect sizes, but were non-significant at this pilot study sample size.
Conclusions: Calendar training may be more effective in improving mADLs than computerized intervention. However, this study highlights how behavioural trials with less than 30-50 participants per arm are likely underpowered, resulting in seemingly null findings. The HABIT program and the literature on cognitive rehabilitation in MCI will be discussed as part of the presentation.
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Mild cognitive impairment (MCI) after bilateral pallidal deep brain stimulation for Parkinson's disease under general anaesthesia
Alexander I. Tröster, Lynn Autry, Krista Hanson, Margaret Lambert, Francisco Ponce
Objective: To evaluate cognitive outcome and post-operative mild cognitive impairment (MCI) status among patients with Parkinson's disease (PD) undergoing bilateral pallidal (GPi) deep brain stimulation (DBS) under general anaesthesia (GA).
Participants and Methods: 22 patients with PD without dementia (14 males, 8 females; 20 right- and 2 left-handed; mean age 63.4 years, education 14.9 years, disease duration 10.7 years) underwent evaluation before and about 6 months after surgery. Tests evaluated intelligence, overall level of cognitive functioning, attention, executive and visuoperceptual functions, language, and memory and a range of psychosocial variables including quality of life (QoL). Means were compared by t-tests, proportions by Chi-square.
Results: The majority of pre- and post-operative mean scores did not differ significantly. Significant improvement ($p<.05$) occurred in visual confrontation naming (>1 SD in 32%). Nine patients had MCI (amnestic, multiple domains) prior to surgery and 14 had MCI (amnestic, multiple domains) after surgery ($p<.05$). Quality of life scores (PDQ-39) regarding satisfaction with cognition and communication were similar before and after surgery.
Conclusions: Bilateral GPi DBS under GA is relatively safe from a cognitive standpoint, a finding not heretofore published. Because the vast majority of test score declines in those developing MCI after surgery were often 1-1.99 or less than 1 SD, patients with normal cognition but borderline MCI pre-surgery might be propelled into the MCI territory by even small score changes. Nonetheless, these changes do not apparently impact QoL. Future studies are needed to determine whether similar findings obtain with "awake" surgery.
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Cognitive complaints in healthy individuals: association with clinical, cognitive and neuroimaging measures
Patricia Díaz Galván, Nira Attemisa Cedrés Fumero, Lissett González Burgos, Yaiza Molina Rodríguez, Alejandra Fernández Machado, Daniel Ferreira Padilla, José Domingo Barroso Ribal
Objectives Cognitive complaints is currently a topic of great interest due to its suggested value as early sign of underlying neurodegenerative diseases. Most of the studies so far have focused on cohorts from clinical settings. However, studying cognitive complaints in large heterogeneous population-based samples is still necessary.
Participants and Methods: A total of 450 healthy participants between 35 and 75 years of age were included in this study. Nine different cognitive complaints were scored, extending complains beyond the over-studied domain of memory. Five disease dimentions were investigated, including demographics, clinical status, mood, structural imaging measures, and a comprehensive cognitive protocol. Associations between complaints and these five dimensions were studied with advanced multivariate data analysis techniques.
Results*:* Cognitive complaints were better predicted by increased depressive symtomathology and older age. Moreover, the association observed with reduced hippocampal volume, greater global brain atrophy, and reduced cognitive performance was explained by depressive symtomathology and age. Of note, naming complaints (i.e. lexical access) were more frequent than memory complaints. Three subtypes were identified and clinically characterized: anomic (anomia complaint), amnestic (memory complaint), and diffuse (executive, attention, orientation complaints).
Conlusions: In an heterogeneous population-based sample, cognitive complaints are associated with subclinical depressive sympthomatology and older age. Further research is warranted to determine whether cognitive complaints are useful predictors of future neurodegenerative diseases in settings with low prevalence of dementia. Results from this study might also be relevant for designing population health strategies.
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Transcranial direct current stimulation enhances sustained attention in ageing - a simultaneous tDCS-EEG investigation
Méadhbh Brosnan, Mahnaz Arvaneh, Ian H. Robertson, Paul Dockree
Objective: Transcranial direct current stimulation (tDCS) is a non-invasive method of brain stimulation which holds the potential for

ameliorating cognitive deficits in both healthy and pathological ageing. However, the neural underpinnings of this technique are not well understood. We explore the potential for tDCS to enhance sustained attention in ageing. The right dorsolateral prefrontal cortex is thought to be a crucial brain area underlying the ability to endogenously maintain attentional focus. We therefore used tDCS to enhance neuronal excitability in this region in an effort to improve sustained attention. We acquired simultaneous electroencephalography (EEG) data to explore mechanisms of improvement.
Participants and Methods: Cognitively healthy older adults (aged 64-84*)* who were low-performing on a sustained attention task were recruited for this study. Participants received real and sham tDCS over two sessions in a single-blind crossover design.
Results: tDCS leads to significant improvements in sustained attention. Analysis of our EEG data suggests that tDCS-related benefits in performance are achieved via enhanced amplitudes of electrophysiological components, previously identified as important for successful sustained attention performance. Moreover, our results suggest that neural changes at very early visual processing stages of stimulus presentation are a key contributor to the tDCS-induced enhancements of sustained attention.
Conclusions: We show the potential for TDCS over the right prefrontal cortex to enhance sustained attention in a population who are cognitively healthy, but have relatively low sustained attention performance capacity. We suggest that improvements in performance are achieved via top-down modulation of task relevant event-related potentials.
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Oral Presentation Session: Child Neuropsychology 08.30 - 10.00

Working memory, short-term memory, attentional control and mathematics performance in moderate to late preterm children - implications for intervention
Emma Matthews, Vaughan Lewis, Gaia Scerif, Phil Yates, Anna Adlam
Objective: Moderate to late preterm children (MLPT; born between 32 weeks and 36 weeks and 6 days) are at increased risk of developing cognitive difficulties compared to children born at term. Difficulties with mathematics are common in very preterm children, but less is known about academic outcomes in MLPT children. This study aimed to explore mathematics ability, and the underlying cognitive domains of working memory and attention, in MLPT children at age 6-8 years and children born full-term.
Participants and Methods: 34 MLPT children and 25 term children aged 6 - 8 years completed assessments of IQ, mathematical attainment, working memory, short-term memory, and attentional control.
Results: MLPT children scored significantly lower on a measure of IQ than the term children. There were no other differences between the groups. In the model of mathematical attainment, gestational age significantly moderated the relationship between attentional control and mathematical attainment. Verbal working memory, attention behaviour, and IQ significantly predicted mathematical attainment when all other variables were present in the model.
Conclusions: The lack of difference between MLPT and term children on measures of cognitive ability suggest that birth weight greater than 1500g, higher socioeconomic status, and lower levels of co-morbid medical conditions may serve as protective factors against the potential negative consequences of MLPT birth. The model of mathematical attainment supported previous findings, and highlighted the need for a variety of tasks to be used to measure domain-general abilities.
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Cognitive phenotypes in idiopathic childhood epilepsy
Bruce Hermann, Qianqian Zhao, Kevin Dabbs, Daren Jackson, Jana Jones, David Hsu, Michael Seidenberg, Dace Almane, Paul Rathouz
Objective: To identify cognitive phenotypes in children with new onset focal and generalized idiopathic epilepsies and determine their relationship with epilepsy syndrome, brain structure, neurodevelopmental history and family characteristics.
Participants and Methods: 138 children with new onset epilepsy and 95 controls (age 8-18) underwent neuropsychological, clinical and quantitative MR evaluations. Control participants'neuropsychological data were subjected to confirmatory factor analysis with resultant factor scores then applied to epilepsy participants and subjected to latent class analysis. Identifiedcognitive phenotypes were examined in relation to epilepsy syndrome, quantitativeneuroimaging, familial and neurodevelopmental variables.
Results: Confirmatory factor analysis identified five cognitive factors (verbal, perceptual, speed, attention, executive) and latent class analysis identified three clusters of epilepsy participants: 1) average and comparable to controls, 2) mild impairment across multiple cognitive domains, and 3) impairment across all domains with severe attentional impairment, representing 44%, 44% and 12% of the epilepsy sample respectively. Cognitive phenotype membership was not associated with epilepsy syndrome but was associated with increasing abnormalities in brain structure, parental IQ and features of early developmental history.
Conclusions: Cognitive phenotypes are present in idiopathic childhood epilepsies that are unassociated with traditional epilepsy syndromes, but are associated with measures of brain structure, family history and neurodevelopmental features.
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Ecological assessment of executive functions in preschool children with sickle cell disease
Michelle Downes, Fenella Kirkham, Paul Telfer, Michelle de Haan
Objective: It is important to understand the impact of an executive deficit on a child in an ecological context. To understand the functional impact of executive problems in a patient group, we must go beyond the application of tests that assess specific deficits by utilising performance-based tasks that assess executive functioning in a micro-analytic way. Understanding a child's level of ability and the level of support they require to complete tasks in an everyday context is integral to the promotion of development in children who have cognitive deficits. Executive deficits on an ecological level have been observed for school-age children with sickle cell disease (SCD) but have not been previously investigated in preschool-age children with SCD, despite the importance of executive functioning for school readiness.
Participants and Methods: Twenty-two children with sickle cell disease and twenty-four ethnicity, age, IQ, and SES children aged three-to-five-years were assessed with an ecologically valid assessment of executive functioning; the Preschool Executive Task Assessment.
Results: The patients performed poorer on the domains of completion, sequencing, and distractibility with a trend for poorer performance on the total composite score and the total number of cues required to successfully complete the task.
Conclusions: This study shows that preschool children with SCD are already showing observable differences in executive performance. The findings shed light on particular domains, such as task completion, that patients may struggle with in everyday life and paves the way for the development of future targeted assessment and intervention for young children with SCD.
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Predictors of post-concussive symptoms in young children: Influence of injury versus non-injury factors
Coco Bernard, Audrey McKinlay, David Krieser, Dean McKenzie, Jennie Ponsford
Objective: A notable minority of children will experience persistent post-concussive symptoms (PCS) following mild traumatic brain injury (mTBI), likely maintained by a combination of pre-injury and injury-related factors. Adopting a prospective longitudinal design, this study aimed to investigate the relative influence of child, family, and injury factors on PCS across the post-injury period, in children of varying ages.
Participants and Method: Participants were 101 parents of children aged 2-12 presenting to an Emergency Department, with either mTBI or minor injury (control). PCS were assessed at time of injury, 1 week, and 1, 2, and 3 months post-injury. Predictors included demographic variables, premorbid child behaviour, sleep hygiene, and parental stress. Random effects ordinal logistic regression

models were used to analyse the relative influence of these predictors across early (acute - 1 week) and late (1 - 3 month) post-injury phases.
Results: Presence of mTBI was a stronger predictor of PCS in the early (Odds ratio (*OR*)=18.2) compared with late (*OR*=7.3) post-injury phase. Older age at injury and pre-existing learning difficulties were significant predictors of PCS beyond one month post-injury. Family factors such as higher levels of parental stress, higher socio-economic status, and being of Anglo-Saxon descent, consistently predicted PCS overall.
Conclusions: Injury characteristics predict PCS for three months following mTBI but show a decreasing contribution over time. On the contrary, pre-existing child and family factors display an increasing contribution to PCS over time. Follow-up for these 'at risk' children which also addresses family stress may minimise longer-term complications in this population.
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Acute and post-acute standardized assessments predict post-concussive symptoms after paediatric mild traumatic brain injury
Keith Yeates, Erin Bigler, Ann Bacevice, Barbara Bangert, Daniel Cohen, Leslie Mihalov, Nicholas Zumberge, Gerry Taylor
Objective: To determine if standardized assessments of symptoms and cognition in the emergency department (ED), or post-acute neuropsychological testing, can predict 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 = 84) were recruited prospectively from EDs at two large children's hospitals. They completed the Standardized Assessment of Concussion (SAC) in the ED to assess cognition and symptoms, as well as the NIH Toolbox cognitive battery at 10 days post-injury. They and their parents rated PCS at 10 days and 3 months post-injury. Children with mild TBI reported more acute symptoms and performed more poorly on the SAC cognitive tasks and the NIH Toolbox fluid cognition composite than a matched group of children with orthopedic injuries (n = 48).
Results: Among children with mild TBI, higher acute symptom ratings on the SAC and lower scores on the post-acute NIH Toolbox fluid cognition composite predicted higher post-acute PCS ratings. Additionally, lower post-acute fluid cognition scores predicted higher ratings of PCS at 3 months post-injury. Higher acute SAC symptom ratings also predicted higher parent ratings of post-acute PCS, but neither the SAC nor the NIH Toolbox predicted parent PCS ratings at 3 months post-injury. All analyses controlled for retrospective pre-injury symptom ratings.
Conclusions: These preliminary findings suggest that systematic assessment in the ED, as well as post-acute neuropsychological testing, may be useful in identifying the children most in need of careful follow-up after mild TBI.
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Rasmussen Syndrome: Cognitive trajectories and brain changes
Sarah Rudebeck, Sara Shavel-Jessop, Tamsin Owen, Sue Harrison, Faraneh Vargha-Khadem, Torsten Baldeweg
Objective: To investigate the cognitive trajectory and brain changes of those with Rasmussen syndrome (RS), a rare childhood disease characterised by atrophy of one hemisphere of the brain.
Participants and Methods: 39 RS participants (right hemisphere affected = 21, left hemisphere affected =18) were identified at Great Ormond Street Hospital and a case note review was performed to gathered all neuropsychological assessments and volumetric MRI scans available. Analyses were conducted to elucidate the changing cognitive trajectory: (1) pre-surgery and (2) pre- to post-op. Group differences were also explored. In a subset of RS participants (N=18) changes in grey matter prior to surgery were also investigated using Voxel Based Morphometry. The relationship between brain changes and cognitive performance was also explored.
Results: Pre-surgery between groups analyses showed the right RS group exhibited more difficulties with tasks of perceptual reasoning, whereas the left RS group had weaker abilities on tasks requiring verbal faculties. From pre- to post-op the left RS group declined in all IQ abilities, whereas the right group's abilities remained better preserved. VBM analyses novelly showed that in a subset of our RS participants brain regions within the unaffected and affected hemisphere of the brain significantly atrophied from 3 to 6 years post-onset of seizures. The decline in grey matter in the unaffected hemisphere was significantly correlated with the change in verbal IQ.
Conclusion: These findings may have important implications for the medical and psychological care of those with RS, in particular, in regard to optimisation of clinical outcome.
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Friday 8th July 2016 Parallel Session G: 15.30 - 17.00

Invited Symposium Session: Integration of semantic and social knowledge to the encoding, retrieval, and simulation of past and future episodes
15.30 - 17.00
Co-Convenors: Francis Eustache, Pierre Gagnepain and Armelle Viard
Speakers: Marlieke van Kesteren, Pierre Gagnepain, Roland G. Benoit, Armelle Viard

How schemas affect mnemonic processing
Marlieke van Kesteren
Abstract: When new declarative memories are formed in the brain, they are typically processed as relating to a preexisting schema. Such a schema, consisting of prior knowledge encapsulated in associative networks in the brain, is thought to enhance integration and storage of memories congruent with the preexisting schema compared to information that is unrelated or incongruent with a schema. This behavioral advantage is believed to be related to differential processes in medial temporal lobe (MTL) and medial prefrontal cortex (mPFC) that occur during and after memory formation. The precise neural mechanisms underlying this schema effect on memory, however, are not yet well understood. In this talk, I will highlight recent human behavioral and functional Magnetic Resonance Imaging (fMRI) studies of encoding, consolidation, and retrieval of schema-related declarative memories, as well as applications for educational settings and future perspectives. Present data show that mnemonic processing requires a schema-dependent interplay between MTL and mPFC structures that act to enhance the storage and integration of congruent memories. Based on these insights, we developed a framework that explains these findings in more detail, unifies them with research on general mnemonic and predictive coding processes, and will provide a basis for further schema research. Better insight into these processes and their effects on memory formation and retrieval can lead to crucial advances in the cognitive neuroscience of learning and memory and can advance educational strategies and curricula in schools and universities.

Tracking collective schemas in individual memories
Pierre Gagnepain
Abstract: Schemas describe mental structures storing recurrent and organized patterns of information. Previous brain imaging studies have exclusively considered schemas isolated from their collective contexts. Social-cultural frameworks stored in collective memory, however, might also shape the construction and organization of individual memories. We recorded brain activity using fMRI in a group of 24 young adults while they were remembering pictures from a tour at the WWII Memorial (Normandy). An image arrangement task was used to capture the structure of participants' semantic space (individual schema). The organization of collective memory was measured at two different levels using: 1) topic modelling analysis of a corpus (http://www.matricememory.fr/) composed of 3500 French television News from 1980 to 2010 about WWII (sociocultural schema), and 2) an internet-based image arrangement task measuring common representations across control individuals (shared schema). These schemas were then compared to the neural organization of individual memories using Representational Similarity Analysis. Semantic distances between images based on visual categories irrespective of historical content served as baseline. Analyses focused on the medial prefrontal cortex (mPFC) given its core role in mediating both schema and social knowledge. Analyses

revealed that individual, shared and sociocultural schemas explained activity patterns in the mPFC better than semantic baseline. However, the combination of shared and sociocultural schemas into a unitized collective organization exceeded individual schemas in mPFC. These finding demonstrate that human memory encapsulates the collective structure of knowledge transcending individuals' own representations.

Episodic simulation of future affective states
Roland G. Benoit
Abstract: Humans possess the remarkable ability to imagine potential future episodes (e.g., meeting a much liked person at a particular place). Such episodic simulation conveys the anticipated emotional experience of a prospective event, thereby informing future-oriented decisions. This presentation highlights the contribution of the ventromedial prefrontal cortex (vmPFC) to this capacity. Previous evidence indicates that, during simulation, the vmPFC supports the integration of knowledge about the event's individual elements (e.g., its place and protagonists). It does so by interacting with distributed brain regions that are presumably involved in the elements' respective neural representations (i.e., parahippocampal cortex for places; dorsomedial prefrontal cortex for people). Importantly, activation in the vmPFC further scales with the anticipated affective quality of the imagined event, thus signaling what it may be like to experience the potential scenario. Recent evidence further elucidates this mechanism and demonstrates that it can change the valuation of the event's constituting elements. Participants imagined meeting liked or disliked people at initially neutral, though familiar, places. Their attitude towards a place changed with the affective value of the paired person. Thus, imagined experiences, much like actual happenings, can shape our attitudes towards elements of our environment. The data further suggest that the vmPFC supports this effect: Activation in this region coded for the identity of the elements, scaled with the person's value, and predicted changes in attitude towards the place. The vmPFC may thus mediate simulation-induced attitude-change by transferring affective value between representations.

Past remembering and future projection without semantic memory: cognitive and fMRI studies in semantic dementia
Armelle Viard
Abstract: Semantic dementia (SD) is characterized by gradual loss of semantic memory and relatively preserved episodic memory. What happens when patients remember their past or project into the future with deficient prior knowledge? We investigated autobiographical memory (AM) retrieval and future projection, both dependent on episodic and semantic memory processes, in two fMRI studies. In study 1, patients (JPL and EP) had to recollect remote (childhood to over 5 years ago) and recent (up to 5 years ago) episodic AMs. In study 2, patients (JPL, EP, LL, EG) engaged in episodic future projection (next 12 months) compared to past remembering (last 12 months). All patients presented characteristic lateral temporal lobe atrophy, but varied in their degree of hippocampal and medial prefrontal (mPFC) atrophy. Study 1 showed that massive anterior hippocampal atrophy (JPL) impaired recent and remote AM retrieval, while spared hippocampi (EP) and compensatory neocortical hyperactivations permitted episodic AM retrieval. Study 2 showed that beyond lateral temporal atrophy, additional mPFC atrophy (JPL, EP) profoundly impaired episodic future thinking, especially if important anterior hippocampal atrophy was also present (JPL). Hyperactivation of contralateral right hippocampus (LL) or neocortical regions (EG) efficiently compensated for atrophy elsewhere. Altogether, beyond their semantic memory impairment, patients' past and future projections differed depending on the severity and localization of their atrophy in two key regions: 1) intensification of hippocampal atrophy strongly affected AM recollection; 2) integrity of mPFC and hippocampi appeared crucial for episodic future thinking.

Symposium Session: Living with cognitive disability: innovations in neuropsychological assessment and rehabilitation for people with progressive neurodegenerative conditions
15.30 - 17.00
Convenor: Linda Clare
Discussant: Robin Morris

Speakers: Dawn Langdon, Aileen Ho, Laura Goldstein, Aleksandra Kudlicka, Tamlyn Watermeyer

Brief International Cognitive Assessment for Multiple Sclerosis (BICAMS): contribution to clinical assessment, management and research
Dawn Langdon
Objectives: About half of people with MS have demonstrable cognitive deficits. These impact negatively on employment, disease management, falls and driving safety and quality of life in general. The pattern is quite distinct, with the most prevalent impairment being slowed information processing and also memory is vulnerable. In this context, language is relatively intact, making detection of weakened cognition difficult in routine conversation with family, employers and health professionals. However formal cognitive assessment and management for MS was not available outside of specialist centres anywhere in the world. The objective was to address this gap.
Methods: An international expert committee rated candidate scales for psychometric excellence and pragmatic aspects.
Results: The resulting BICAMS offers a brief assessment with good psychometric properties, particularly sensitivity, which is feasible in most clinical settings. It has been recommended by the American Academy of Neurology and there are 28 countries in the international validation pipeline.
Conclusions: BICAMS allows health professionals with no specialist psychological training to assess cognition in the MS clinic and determine if cognitive impairment is present. If it is, then consultations can be adapted to deliver information in more suitable ways and to monitor disease management more effectively, particularly taking account of disease management and other safety issues. Clients requiring more specialist neuropsychological input can be appropriately triaged and referred. BICAMS has also facilitated trans-national databases and research work, providing an international currency to describe the cognitive status of people with MS.

Verbal memory performance in Huntington's disease - clues from a closer look
Aileen Ho, Roger Barker, Hannah Pritchard
Objective: This study investigated verbal learning and memory abilities in manifest Huntington's disease using the Hopkins Verbal learning Task to determine how and why performance may change over time.
Participants and Methods: Over a five year follow-up period, standard immediate and delayed memory measures as well as learning curves, serial positions curves and clustering scores were examined annually in a group of twenty mild to moderate Huntington's disease patients.
Results: Free recall, both immediate and delayed, deteriorated significantly over five years, and compared to normative data impaired semantic clustering, learning curve trajectory and serial position effects were evident from the baseline assessment. While recognition performance appeared relatively intact over time, the significant increase of false positive errors suggested that this was achieved in parallel with an over-inclusive recognition response bias.
Conclusions: The patterns of longitudinal decline and deviations from normative data reported in the literature implicate continuing impairment of executive function processes in mild to moderate HD. Our data underline the very gradual nature of verbal memory impairment which suggests that these measures are less suitable for shorter studies, although they remain useful indicators of day to day memory.

Executive dysfunction in amyotrophic lateral sclerosis: implications for decision-making
Laura Goldstein, Naomi Martin, Ammar Al-Chalabi, P. Nigel Leigh
Objectives: To consider the importance of carer-rated executive dysfunction and other psychological variables for decision-making concerning non-invasive ventilation (NIV) and gastrostomy in people with Amyotrophic Lateral Sclerosis (ALS), in the context of wider knowledge about the role of executive dysfunction in prognosis in ALS
Participants and Methods: We recruited 78 people with ALS and 50 caregivers from the South-East ALS Register. Baseline physical, cognitive (including carer-rated measures of executive dysfunction on

the Frontal Systems Behavior Scale- FrSBE) and psychological measures (e.g. mood, purpose in life, illness perceptions, spirituality) were obtained. We followed patients up at 3-monthly intervals to monitor whether they had accepted / refused NIV or gastrostomy. After intervention decisions, further interviews repeated baseline measures and assessed further intervention-specific beliefs.
Results: We observed higher premorbid IQ and educational level and an active approach towards illness in those making a decision to refuse/accept an intervention. Aspects of executive dysfunction rated on the FrSBe at baseline and post decision appeared related to intervention refusal. Also relevant were patients' own concerns, understanding of and perceived necessity for an intervention, as well as aspects of spirituality.
Conclusions: Since other studies have demonstrated the relevance of executive dysfunction for treatment compliance and prognosis in ALS, current findings raise the possibility that cognitive impairment in people with ALS may be also be influential in how interventions are made available or information is presented to patients. Greater awareness needs to be raised of these non-illness related factors that may influence decision-making and therefore survival.

Understanding the goal-setting process in cognitive rehabilitation for people with early-stage dementia
Aleksandra Kudlicka, Suzannah Evans, Linda Clare
Objective: There is promising evidence that people with early-stage dementia (PwD) can benefit from individualised cognitive rehabilitation interventions, and can successfully engage in the process of eliciting therapeutic goals. The Bangor Goal Setting Interview schedule was developed as a means of structuring the process of identifying therapy goals. In this study we examined the goal-setting process and the nature of the goals identified.
Participants and methods: The Bangor Goal Setting Interview was used to elicit therapy goals for people with early stage AD, vascular, or mixed dementia as part of the baseline assessment in the ongoing GREAT trial. Researchers and PwD worked together to identify two or three specific, measurable, achievable, personally relevant and time-bound therapy objectives related to everyday functioning. Thematic analysis was used to reveal common themes in the identified goals.
Results: We analysed a total of 591 therapy goals identified by 209 PwD. Goals were associated with nine domains: socialising, exercising, engaging in meaningful activities, using new technology, carrying out activities of daily living, remembering names, locating lost items, managing medication and improving orientation. Participants were motivated to work on these goals for a range of reasons, including reducing dependence and improving enjoyment of life.
Conclusions: Significant numbers of people with early stage dementia are able to identify meaningful therapy objectives. These personalised rehabilitation goals provide information about the areas where support would be most welcomed by people with dementia, and can be used to inform the development of genuinely person-centred rehabilitation interventions.

Developing a cognitive rehabilitation approach for people with Parkinson's Disease Dementia and Dementia with Lewy Bodies: the CORD-PD trial
Tamlyn Watermeyer, Julie Roberts, Linda Clare, John Hindle
Objective: Approximately 30% of people with Parkinson's disease (PD) experience a dementia that shares a similar neuropsychological profile to that of Dementia with Lewy Bodies (DLB). Pharmacological treatments are available, but due to possible side-effects, may not be suitable for all patients. Non-pharmacological interventions may offer an alternative to support people with early Parkinson's disease dementia (PDD) and DLB. Cognition-focused interventions, mostly cognitive training, have been explored in people with PD who have mild cognitive impairment, but no studies to date have assessed such interventions in PDD or DLB. The efficacy of cognitive rehabilitation (CR) in Alzheimer's disease and other dementias is currently being explored in the ongoing GREAT trial. However, since the application of CR in PDD and DLB may be complicated by the distinct features of these disorders, notably their parkinsonian symptoms, these patients were not included in GREAT. Our objective was to adapt the CR approach for people with PDD and DLB.
Participants and methods: CORD-PD is an ongoing pilot RCT that aims to assess the feasibility and potential effectiveness of CR for people with early PDD and DLB.
Results: We will make use of case studies from our work so far to illustrate the types of goals identified. Issues surrounding goal-setting and implementing CR with PDD and DLB patients will be discussed.
Conclusions: We will consider the expected results and possible clinical implications of this research. Finally, we will reflect upon the lessons learned from this pilot study for the development of a future fully powered RCT.

Symposium Session: The clinical utility of neuropsychological genetics: Treatment follows cognitive phenotyping 15.30 - 17.00
Convenor: Jos Egger
Discussant: Tjitske Kleefstra
Speakers: Tjitske Kleefstra, Jos Egger, Karlijn Vermeulen, Linde Van Dongen, Renée Roelofs

The scientific and clinical relevance of studying rare genetic/neurodevelopmental disease
Tjitske Kleefstra, Rolf Pfundt, Han Brunner, Jos Egger
Objective: Intellectual disability (ID) with or without autism spectrum disorders (ASD), is one of the main reasons for referral to a clinical geneticist. ID has a major impact on affected individuals, their families and society. The recent advances in genetic technologies have enabled to identify disease causing variants throughout the whole human exome, even at the single base-pair level of the DNA. This significant increase in diagnostic potential is of high value for proper genetic counseling and paves the way for studying fundamental aspects of brain functioning on one hand and the more personalized approach of syndrome specific management of ID disorders at the clinical site on the other hand.
Participants and Methods: So far, over 2000 ID patients have been investigated in our genome diagnostic center by whole exome sequencing which revealed a diagnostic yield of around 30%. Though most genes are very rarely affected, by collaborative efforts with other (inter)national genetic departments, substantial cohorts enable the definition of numerous such novel rare genetic syndromes.
Results: Examples of novel syndromes that we have recently defined are GATAD2B, POGZ, KBG, USP9X and DDX3X. The increase in novel syndromes needs multidisciplinary expertise and care including neuropsychiatric involvement.
Conclusions: The potential of novel genetic techniques will be discussed and examples of novel syndromes will be given. Syndrome specific management and how to centralize expert knowledge will be highlighted by our experience through our expert center and the formation of European Reference Networks.

Phelan-McDermid syndrome: Neuropsychological phenotype, cerebellar functioning and treatment selection
Jos Egger, Willem Verhoeven, Renée Zwanenburg, Conny Van Ravenswaaij, Clara Bonaglia, Tjitske Kleefstra
Objective: The 22q13.3 deletion syndrome or Phelan-McDermid syndrome is characterized by a variable degree of intellectual disability, impaired speech and language as well as social communicative skills, and mild dysmorphic features. The SHANK3 gene is thought to be a major contributor to the phenotype. Apart from the syndrome associated autistic features, symptoms from the bipolar spectrum can be discerned, in particular behaviour instability and fluctuating mood culminating in a (hypo)manic state. In case of coincident major somatic events, a deteriorating course may occur.
Participants and Methods: The present study comprises seven adult patients (four females, three males; aged 21-44 years) with genetically proven Phelan-McDermid syndrome. Data from medical records were collected and extensive assessment of neuropsychological variables was performed to identify cognitive characteristics and their relation with psychopathology and treatment.
Results: All patients showed profound communication deficits and their developmental functioning ranged from 1;0 to 6;3 years. In addition, they had slow speed of information processing, impairment of attentional and executive functions, and cognitive alexithymia. As to psychopathology, features from the affective and anxiety domains were prominent findings in these seven patients suggesting the

presence of a bipolar spectrum disorder,that could be effectively moderated with mood stabilizing agents.
Conclusions: Results are discussed in terms of the putative involvement of structural brain abnormalities, in particular cerebellar vermis hypoplasia and corpus callosum thinning and their cognitive and emotional sequellae. It is concluded that treatment of 22q13.3 associated psychopathology should include prescription of mood stabilizing agents in combination with individually tailored contextual neuropsychological measures.

Neurocognition, adaptive functioning, and psychopathology in Kleefstra syndrome
Karlijn Vermeulen, Tjitske Kleefstra, Wouter Staal, Hans Van Bokhoven, Jos Egger
Objective: The diagnostic yield for rare genetic causes for ID has increased tremendously over the last years. Studies that focus on sub-cohorts with known underlying genetic causes may enable to define more specific profiles that potentially could guide tailor made management. In our present study we aimed to examine if EHMT1 gene defects, which are also known as Kleefstra Syndrome (KS) in human, are associated with specific profiles for adaptive and maladaptive functioning.
Participants and Methods: In total we studied 58 subjects with ID (28 males, 30 females): 24 with Kleefstra Syndrome and 34 controls. They were examined with the Vineland Adaptive Behavior Scale, mini PAS-ADD interview, Autism Diagnostic Observation Schedule and the Cambridge Neuropsychological Test Automated Battery (CANTAB) to obtain measures of adaptive and maladaptive functioning. This study has an explorative nature and statistical analysis were used to contrast the results (Fisher's exact test for prevalences, Mann-Whitney tests for subscale scores).
Results: KS-participants have low levels of adaptive functioning. Autism spectrum disorders are extremely prevalent (about 100%, p=0,001). There are also signifantly high prevalences and symptom scores for depressive episodes (41,6%, p=0,043), obsessive compulsive disorders (33,3%, p=0,03) and psychotic symptoms (29,2%, p=0,005). The performance and results at the CANTAB are discussed in line with these. All together this results in a discriminating neuropsychiatric picture in KS patients.
Conclusions: KS patients are extremely vulnerable to develop neuropsychiatric disorders and should be carefully monitored for this.

Delineation of the cognitive phenotype of KBG syndrome
Linde Van Dongen, Tjitske Kleefstra, Ellen Wingbermühle, Conny Stumpel, Jos Egger
Objective: KBG syndrome is caused by a mutation in the ANKRD11 gene and characterized by a short stature and specific dental, craniofacial and skeletal anomalies. The relatively limited amount of literature on phenotypical presentation, mentions delayed speech and motor development as well as mild to moderate intellectual disabilities. As to psychopathology, autism and ADHD are often described, but not yet substantiated in terms of neurocognitive variables. Aim of the current study was to investigate neurocognitive aspects of KBG syndrome, in particular attentional and social cognitive functioning.
Participants and Methods: Seventeen patients (aged 6-66 years; ten females) with an ANKRD11 mutation were compared with two different groups of patients with genetic disorders and similar mental ages (n=14 and n=10). Neuropsychological assessment was performed focusing on the level of intellectual functioning and on attention, memory, executive functioning, and social cognition).
Results: Preliminary results showed mild to moderate intellectual disabilities (TIQ 45-84, M=63.5, SD=10.7). Mean mental age (M=6.4 years, SD=2.6 years) was lower than mean chronological age (M=11 years, SD=5.7 years). When compared to both control groups, results indicated a relatively strong processing speed and social cognitive functioning and a relatively weak performance on the direct recall of auditory memory tasks.
Conclusions: The cognitive profile of this group of 17 patients with KBG is characterized by mild intellectual disability and diminished sustained attention in verbal tasks that fits the ADHD symptoms descripted in the scarce literature on KBG. Implications for diagnostic procedures and clinical management the syndrome are discussed.

Toward a Noonan syndrome specific social cognitive training
Renée Roelofs, Ellen Wingbermühle, Ineke Van der Burgt, Roy Kessels, Jos Egger
Objective: The neuropsychological profile of patients with Noonan syndrome (NS) is characterised by lowered processing speed and impairments in social cognition (SC). Treatment of SC deficits has proven to be effective in other neuropsychiatric populations. The aim of this study is to perform a systematic review and to incorporate the results in a new, customised intervention protocol for the improvement of SC in patients with NS.
Participants and Methods: Controlled studies on SC interventions for adults with neuropsychiatric disorders, published between 1-1-2003 up to 1-1-2015, were identified through a systematic literature search in PubMed, Web of Knowledge, and PsycINFO databases.
Results: From the initial 4.565 hits, 101 full-text articles were assessed for eligibility, and 34 articles were included in the review. Studies predominantly focused on patients with schizophrenia (n=25), acquired brain injury (n=5), and autism (n=4). 'Simple' SC processes like emotion recognition were the main intervention targets. Treatment duration and intensity were highly variable (1-56 sessions; 1 week-2 years). Group size ranged from 1 to 12 patients, with an average of 5.
Conclusions: As patients with NS show deficits in the perception, interpretation, and expression of social-emotional information, a comprehensive approach seems most appropriate to improve SC in this group. Therefore, besides training of emotion recognition and theory-of-mind strategies, a specific SC treatment for adults with NS should also address problems in the identification and verbalization of (own) emotions. A training protocol comprising the aforementioned elements will be presented.

Symposium Session: Complexity of assessment for people in prolonged disorders of consciousness
15.30 - 16.30
Convenor: Anita Rose
Discussant: Agnes Shiel
Speakers: Samira Dhamapurkar, Olivia Gosseries

Delayed recovery from the Vegetative and Minimally Conscious States
Samira Dhamapurkar, Barbara Wilson, Anita Rose, Gerhard Florschutz
Objective: Severity of brain injury is determined by the depth and duration of coma. Most patients who recover from coma open their eyes by four weeks post injury. They are then no longer in coma. They may have recovered full consciousness or they may still have reduced awareness/a disorder of consciousness (DOC). There is disagreement as to the percentage of patients who remain with a DOC after several months and then show some recovery. The aims of this study were to identify patients who made a delayed recovery 12 or more months after remaining with a DOC. Investigating if recovery was more likely for those who survived traumatic brain injury (TBI) and those who survived from other causes (mainly hypoxia).
Participants and Methods: All patients (N=33) with a disorder of consciousness, admitted to a rehabilitation centre over a five year period, were assessed with the Wessex Head Injury Matrix (WHIM) and the Disability Rating Scale (DRS) to determine if they had emerged from a DOC.
Results: Seven patients died. Twenty patients remained with a DOC for 12 or more months (11 in the Vegetative State and 9 in the Minimally Conscious State. Six patients (18%) emerged from a DOC (showed delayed recovery). Of these 5 had sustained a TBI and 1 had hypoxic damage.
Conclusion: We found that 18% of people who had a DOC for 12 or more month's recovered consciousness and that survivors of a TBI were more likely to show delayed recovery than non TBI patients.

The use of neuroimaging technique in the diagnosis assessment of disorders of consciousness
Olivia Gosseries, Steven Laureys
Objective: Evidences that some patients with disorders of consciousness (DOC) have higher level of cognition than behaviourally accessible are growing. Recently, cerebral positron emission tomography has shown its prognostic value in this population. The perturbational complexity index derived from

transcranial magnetic stimulation and electroencephalography segregates unresponsive subjects from those where consciousness is present. We combined these techniques to look for complementarity and mismatches in patients with disorders of consciousness.
Participants & Methods: We recruited 52 patients with acquired brain injuries leading to a chronic DOC. We recorded electroencephalography during transcranial magnetic stimulation over left or right superior parietal gyrus and superior frontal gyrus, cerebral 18-fluorodeoxyglucose positron emission tomography at rest, active functional magnetic resonance imaging during motor imagery and spatial navigation tasks, and repeated behavioural assessments.
Results: We obtained the perturbational complexity index in 32 patients, positron emission tomography results in 39, and both in 24. Eight patients were behaviourally unambiguously unresponsive but had indirect signs of consciousness detected by transcranial magnetic stimulation coupled with electroencephalography, positron emission tomography, or both. There was a mismatch between the two techniques in two patients. Active functional magnetic resonance imaging detected wilful modulation of brain activity in one unresponsive patient, also detected by the metabolic and neurophysiological imageries.
Conclusion: The combined use of transcranial magnetic stimulation with electroencephalography and positron emission tomography allows the detection of cover consciousness in some patients with chronic DOC otherwise considered unresponsive. The mismatches between these techniques highlight new mechanisms underlying the emergence of consciousness.

Poster Session 1: Wednesday 6th July 2016 11.00 - 13.00

Aging - Poster Session 1 - 11.00 - 13.00		
Number	**Presenter**	**Poster Title**
1	Alfonso Caracuel	Computerized verbal memory training in the elderly with VIRTRA-EL: a free cognitive stimulation software
2	Katerina Cechova	Episodic-like memory changes during healthy aging
3	Daniel Cox	Hippocampal subfield diffusivity changes and recollection memory in healthy ageing
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Computerized verbal memory training in the elderly with VIRTRA-EL, a free cognitive stimulation software
Alfonso Caracuel, Sandra Rute-Pérez, Miguel Pérez-García, Gustavo Cuberos-Urbano, Igor Bombín
Objective: To determine the effectiveness of the cognitive stimulation platform VIRTRA-EL (Virtual Training in the Elderly) for improving verbal memory.
Participants and Methods: Seventy-one elderly (79% women) without dementia, with a mean age of 70.5 years and mean schooling of 6 years were evaluated with the Hopkins Verbal Learning Test-Revised (HVLT-R), before and after a computer program training with VIRTRA-EL (www.virtrael.es). Program duration was seven weeks with two weekly sessions of 45 minutes each. During all sessions, participants performed exercises for attention, memory, reasoning and planning abilities. Exercise difficulty increased with improved execution.
Training exercises aimed at improving verbal memory are: 1) Errand List, consisting of a classical task of learning and remembering lists of errands, and 2) Classification of Objects which are processed categorically. Pre- and post scores were compared using Student's t test for repeated measures.
Results: Statistically significant difference between the means at times pre (6,14; SD=2,35) and post (11,58; SD=7,39) [t(1,70)=-6,341, p<0,001]were found.
Conclusions: Training by VIRTRAEL software improves verbal memory of older people, increasing their ability to learn and correctly remember verbal type information. The clinical relevance of these findings lies in providing evidence of the effectiveness of a tool that is free and can be used in bulk, independently or supported by relatives or therapists. Cognitive stimulation could delay the onset of cognitive impairment. The online character through any browser provides access to cognitive stimulation to older people who live far from health care resources or have mobility difficulties.
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Episodic-like memory changes during healthy aging
Katerina Cechova, Kamil Vlcek
Episodic memory represents the memory of specific events and temporal-spatial relations among these events. It involves our conscious recall and mental time travel (Tulving, 1972). As an analogy of episodic-like memory that can be tested in animals, the memory for time (when) and location (where) of a certain event (what) in the past was proposed. This concept named "what-where-when" (WWW) is tested in human subjects to prove that this is a valid model of episodic memory in humans. At the Institute of Physiology of the Academy of Sciences of the Czech Republic, a nonverbal computer test of episodic-like memory (EMT) was developed. The EMT offers several versions of varying difficulty that allow us to differentiate between memory for pictures (what), their sequence (when) and location (where). The EMT test is not based on verbal content, therefore, the comparison of the results from the EMT test

with other verbal episodic memory tests would be of interest. Standardization of the EMT test allows its use in neuropsychological assessment, especially in the early detection of neurodegenerative diseases. The EMT test could enrich neuropsychological battery just for its unique nonverbal nature. The aim of this study is to evaluate changes in the episodic-like memory related to healthy aging. A battery of standard psychological tests of episodic memory (RAVLT, Logic memory, BVMT-R, Corsi) and our nonverbal computer test (EMT) were administrated to 61 cognitively healthy adults in three age cohorts. MoCA was used to assess overall cognitive status of subjects.
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Hippocampal subfield diffusivity changes and recollection memory in healthy ageing
Daniel Cox, Hamied Haroon, Daniela Montaldi, Laura Parkes
Abstract: Alterations in microstructure may precede volumetric changes in ageing, and these changes may occur differently across hippocampal subfields. We investigated established (fractional anisotropy (FA)/mean diffusivity (MD)) and novel (diffusion-orientation-complexity (DOC)) measurements of diffusion in these regions, in addition to volume, to determine where age-related changes occurred and how these related to declines in recollection memory.
30 data-sets (age 18-30 (n15), 60-82 (n15)) were used in this study. Structural T1-weighted and High Angle Resolution Diffusion Imaging (HARDI) data were collected using a 3T Philips Achieva system with an 8-element head coil. Diffusion data was corrected for distortion. In-house software calculated voxel-wise probability maps for *n* number of fibre orientations (DOC 1, 2, 3 and >3 respectively). All T1-weighted images were segmented in Freesurfer. Subfield regions (CA1, CA2-3, CA 4-dentate gyrus (DG)) were transformed into native space, thresholded to only include grey matter and registered into diffusion space for each subject. Diffusion values were extracted for left and right CA regions.
No significant results were seen between subfield volume and age. MANOVA analyses showed significant age-related MD changes in left CA1/4-DG and right CA1/2-3/4-DG, FA changes in left CA2-3/4-DG and right CA4-DG, and DOC changes in left CA2-3/4-DG. Significant correlations between recollection performance and bilateral MD and left CA2-3 DOC1 and DOC 3 were seen in the older group.
Measures of hippocampal microstructure may act as sensitive markers of age-related neurophysiological decline compared to tissue atrophy, and recollection memory declines may result from differential degradation of cellular structures across these regions.
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Executive functions empowerment in healthy aging: what about electrophysiological markers?
Davide Crivelli, Michela Balconi
Objective: Age-related changes in information-processing and executive control are accompanied by the alteration of electrophysiological components mirroring those processes. Such electrophysiology markers may also offer useful information for the evaluation of experimental empowerment protocols and may help in overcoming the limitations of behavioural outcome measures. We then designed a longitudinal study and compared behavioural and electrophysiological modulations induced by a cognitive- and a neuromodulation-based empowerment protocol. In particular, we focused on the N2 event-related potential (ERP) - associated to basic information-processing and investigated as biomarker of the progression to pathological decline.
Participants and methods: 28 healthy elderly were divided into two experimental and a control group. A standardized assessment procedure was performed at the beginning of the study, after the intervention period and at follow-up. Besides neuropsychological testing, we also recorded resting EEG and ERP responses during a Stroop-like task. The empowerment protocols lasted eight weeks and included three sessions per week.
Results: Firstly, statistical analyses of neuropsychological data suggested that the experimental protocols lead to partially different improvement profiles, and such improvements were still partially present at the follow-up. Secondly, we observed an increase of N2 deflection at the end of the neuromodulation protocol. Interestingly, that effect was localized consistently with the stimulation montage.
Conclusions: Due to their remarkable sensitivity to changes in cognitive functioning and their temporal resolution, ERPs are valuable candidates as markers of decline progression for specific processes. Present evidences begin to highlight their potential also as objective indices of intervention effects even in healthy elderly.
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Collaborative learning in healthy aging: Does interlocutor identity matter?
Catherine J. Crompton, Maria K. Wolters, Sarah E. MacPherson
Objective: Learning and memory abilities decline with age; however collaborative learning paradigms with a familiar partner improve older adults' performance and reduce these age-related differences. The current study compared participants learning with familiar and unfamiliar partners, and with perceived human and computer partners in a Wizard-of-Oz spoken dialogue system to determine whether collaboration alone is sufficient to improve older adults' performance.
Participants and Methods: Study 1 involved older and younger (n=48) participant pairs arranging abstract tangram shapes in specific orders on a grid in familiar and unfamiliar pairs. Study 2 involved older adults (n=24) performing the same card-matching task with participants believing they were interacting with a human partner, or a computer partner.
Results: In Study 1, older adults initially performed more poorly than younger adults, taking more time and using more words to correctly arrange the tangrams. A learning effect was observed in both groups and by the final trials, older and younger groups' performances did not significantly differ. In Study 2, initially participants were quicker at completing the task with the computer partner, but by the final trials were significantly faster with a perceived human partner. Participants also changed their answers significantly more with a computer partner.
Conclusions: Within this collaborative learning paradigm, older adults achieve the same level of performance as younger adults over multiple trials. Collaborating with a familiar partner does not improve performance compared with an unfamiliar partner but learning with a perceived human partner was more effective and efficient than with a computer partner.
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Lexical retrieval in healthy aging
Aviah Gvion, Michal Biran
Objective: Various studies reported deterioration in naming ability with age, which begins mainly around the age of 70. An interesting question is whether it can be explained in terms of the psycholinguistic model of lexical retrieval. Namely, can we identify the loci of the impairment (semantic/phonological) in the lexical retrieval process?
Participants and Methods: The performance of 100 healthy individuals aged 65 years and above was compared to younger individuals. We conducted six experiments that examined picture naming, naming to definition, lexical-semantic tasks without naming (word associations, synonym judgement), lexical-phonological tasks (oral reading), words and pseudowords short-term memory spans and sentence comprehension with semantic or phonological load.
Results: A mild deterioration was found in naming from the age of 40 and a sharp deterioration from the age of 70. Differently from the young adults, elderly were affected by the frequency and the imageability of the target words. Analysis of naming errors revealed typical errors both to lexical-semantic and lexical-phonological deficits. Furthermore, elderly performed significantly worse than younger individuals in all tasks that tested lexical-semantics without naming. An effect of age was found for word spans but not for pseudoword spans. Further support for lexical-semantic effect on the elderly's performance was found in the task of the syntactic processing that indicated that elderly were more prone to errors in sentences with semantic load.
Conclusions: The results indicate that naming deterioration of the elderly can be ascribed both to the lexical-semantic level and the lexical-phonological levels.

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Cognitive Age-related Decline is More Prominent in Executive Function than in Elementary Perceptual Speed: Evidences from the Yakumo Longitudinal Study

Takeshi Hatta, Kimiko Kato, Akihiko Iwahara, Mari Higashikawa, Taketoshi Hatta, Junko Hatta, Kazumi Fujiwara, Ayako Kawakami

Objective: The proposal that an age-related decline in executive function measures is particularly pronounced rather than in elementary perceptual function was examined using longitudinal database. Working hypotheses were first that the declining slope for executive function would be steeper than the slope for elementary perceptual function, and second the number of participants who show a steeper declining slope for the executive function than for elementary perceptual function would be greater than the number of participants who show the reverse tendency.
Participants and Methods: Participants were community dwellers age from 65 to 75 years old. In D-CAT1, participants were requested to mark the given single target digit with a slash and in D-CAT3, they were requested to mark three given target digits with slashes as fast and as accurately as possible within 60 seconds. Therefore, it can be regarded that D-CAT1 mainly indicates elementary perceptual speed, whereas D-CAT3 specifies executive function. To examine the working hypotheses, a linear regression coefficient was calculated individually for D-CAT1 and D-CAT3.
Results: Mean regression coefficient for D-CAT3 was smaller than for D-CAT1. This means that the declining slope for D-CAT3 was steeper than the slope for D-CAT1. Sixty-five participants demonstrated a steeper decline in D-CAT3 than in D-CAT1.
Conclusion: The results supported the proposal that age-related decline in executive function measures would be particularly pronounced compared to elementary perceptual speed tasks (Bucur & Madden, 2010).
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Testing the Difference Engine Model of Processing Speed in Older Participants

Yue-Zong Tsai, Kuo-Lun Huang, Ting-Yu Chang, Tsong-Hai Lee, Meng-Yang Ho

Objective: Slowness in different speeded cognitive tasks during late adulthood is a ubiquitous phenomenon. The *difference engine model* (DEM, Myerson et al., 2003) posits that most of the variance in individual speeded performance could be explained by a single general factor on which diverse tasks load approximately equally. The proposition has been supported by the data from young participants, but has not yet been tested in older participants.
Participants and Methods: Seventy-seven healthy volunteers (39 females and 38 males), aged from 19 to 79 years (M = 42.8, SD =22.0) participated in this study. They were divided into the young (n = 40) and old (n = 37) groups. All participants underwent 7 speeded cognitive tasks that tap verbal, visuospatial, and selective attention functions, each consisted of three conditions with different difficulty. The reaction times (RTs) and diversity of RTs as measured by standard deviation (SD) of these tasks were subjected to various regression analyses for examining the DEM's predictions.
Results: Principal component analysis revealed the RTs of all conditions of the speeded tasks loaded heavily on a single speed factor, account for 75% variance of the RTs. The diversity in speed performance increased proportionally with task difficulty (r^2 > .95). Strictly linear relations (r^2 > .95) between the RTs of all fast and slow subgroups and their corresponding age groups were also detected.
Conclusion: The results of this study lend further support for the assumptions of DEM, particularly at the group level.
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Prenatal sex hormone exposure (2D:4D) and cognitive functions in middle aged and older adults

Akihiko Iwahara, Ayako Kawakami, Takeshi Hatta

Objective: Numerous studies have examined the relationship between testosterone level and cognitive performance in the older. Some evidence indicates that relatively low testosterone levels are a key component of the cognitive decline and a risk factor of Alzheimer disease. In the present study we investigate an association between prenatal sex hormone exposure and cognitive functions.
Participants and Methods: Participants were 301 community-dwelling middle aged and older persons without dementia. The cognitive functions were measured by means of logical memory test, Money road test, Stroop test, D-CAT (digit cancellation test) and verbal fluency test. We estimated prenatal testosterone using the second-to-fourth digit ratio (2D:4D).
Results: We constructed a series of linear regression models to examine the association of prenatal sex hormone exposure with cognitive functions for men and women separately. In analyses controlling for age and education, lower level of prenatal testosterone estimated by 2D:4D in the right hand was related to lower performance in logical memory test in men. On the other hand, lower level of prenatal testosterone estimated by 2D:4D in the left hand was related to lower performance in logical memory test in women.
Conclusions: The results suggest that lower level of prenatal testosterone is a risk factor for the decline of the memory performance. We demonstrated that the relationship between prenatal sex hormones and memory function is applicable not only to men but also to women.
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A longitudinal study of demographic effects on naming people and objects after age 70.

Gitit Kave, Shimon Fridkin, Liat Ayalon

Objectives: We investigated whether the change in retrieval of proper names and of object names is similar, and whether it is similarly affected by demographic variables after age 70.
Participants and Methods: The sample consisted of 3,024 individuals who participated in the Health and Retirement Study between 2004 and 2012 and completed all five waves of cognitive testing (age 70-94 in 2004). Participants were asked to name the U.S. president and vice president, and two objects from brief definitions. Latent growth models were used to examine the effects of age, education, and self-rated health on initial performance and on the trajectory of change.
Results: A model with no demographic variables showed lower scores for proper names than for object names at initial testing, with greater decline in retrieval of proper names than in retrieval of object names. Once all demographic variables were entered into the analysis, age and education had a greater effect on retrieval of proper names than on retrieval of object names for both initial scores and for the trajectory of change. In contrast, similar effects of self-rated health emerged for both types of stimuli for initial scores as well as for the trajectory of change.
Conclusions: The results suggest that retrieval of proper names is disproportionately affected by age and education relative to retrieval of object names. This difference is most likely related to the fact that object names are nested within a rich semantic network that supports automatic retrieval, whereas proper names have no such network.
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Age prediction by means of multiple cognitive measures: a novel multivariate approach in Normal Aging

Alejandra Machado, Daniel Ferreira, Yaiza Molina, Antonieta Nieto, Eric Westman, Jose Barroso

Objective: Findings in studies of Normal Aging have shown common features in cognitive decline related to aging. However, profile variability has been described across studies, which may be partially explained by the common univariate approach used in most of the studies. Our aim is to use a novel multivariate approach in Normal Aging in order to study cognitive measures from an integrated point of view.
Participants and Methods: A total of 460 participants (35-85 years) were selected from the GENIC Database. Cognitive status was assessed by a comprehensive neuropsychological battery (40 variables). Orthogonal Partial Least Squares (OPLS) was implemented as a multivariate approach. This technique is based on regression models where the systematic variability is separated between correlated and uncorrelated variation to the studied response.
Results: The 40 variables were grouped in eight cognitive domains. An OPLS model was conducted for each cognitive domain, all of them resulting significant (Q^2>0.10). A hierarchical model (OPLS-HA)

with previous cognitive domains showed that memory (retrieval) best predicts age followed by executive functions, cognitive processing speed and visuoconstructive, visuospatial and visuoperceptive functions, between others. This model had an explained variance (R^2X) of 72.9 %.
Conclusions: Our results suggest that when studying cognition in aging from a multivariate perspective, memory (retrieval) shows greater association with age, followed by commonly referred executive functions and processing speed. This result depicts the magnitude of decline within a 50 year age-range but not the moment of decline and thus, puts into context some previous univariate studies in Normal Aging.
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Prevalence of subjective cognitive complaints and association with cognition and depressivity in healthy elderly: data from Czech NANOK study.
Hana Markova, Ross Andel, Hana Stepankova, Miloslav Kopecek, Tomas Nikolai, Jakub Hort, Martin Vyhnalek
Objective: Subjective cognitive complaints (SCC) are regarded as an early marker of neurodegenerative processes. The aim was to study prevalence of SCC and association between level of SCC, cognition and depressivity in cognitively normal elderly (CNE), volunteers of Czech NANOK (National Normative Study of Cognitive Determinants of Healthy Ageing).
Participants and Methods: A population of 340 CNE, community-dwelling volunteers, aged ≥ 60, underwent a complex neuropsychological assessment and were administered 15-item Geriatric Depression Scale (GDS-15) and a 10-item yes/no Cognitive Complaints Questionnaire (CCQ). Only CNE, not meeting criteria for Mild Cognitive Impairment (MCI), were included. Regression analysis controlled for age and depressive symptoms with cognitive domains expressed as z-scores was performed.
Results: In all, 71% of subjects reported at least one SCC, 47% reported two or more SCC and 25% reported three or more SCC. "Word finding difficulties" was the most common SCC (reported by 40%), followed by "Difficulties with recalling past events (32%) and "Feeling of memory change" (29%). Number of complaints was slightly associated with poorer memory (Estimate=-0.04, p=0.02) and attention (Estimate=-0.07, p=0.03), no association was found between CCQ score and executive function or language. The strongest association was found between level of SCC and GDS-15 (Estimate=0.29, p<0.001).
Conclusions: SCC are very common in population of Czech cognitively normal elderly, where higher level of SCC is linked rather to higher depressive symptomatology than to poorer cognition. Three most common complaints were identified.
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Size of the intervals of comparison or critical points in the detection of cognitive and neuroanatomical decline in normal aging.
Yaiza Molina, Daniel Ferreira, Alejandra Machado, Juan Andrés Hernández, Antonieta Nieto, Eric Westman, Jose Barroso
Objectives: It is known that cognitive decline associated with age in normal aging begins in early middle-age stages. We addressed the question whether the detection of cognitive and neuroanatomical decline associated with age depends on the size of the intervals of comparison used or if there is a critical point around a certain age.
Participants and method: 271 cognitively normal participants (aged between 40±2 and 75±2) were assessed with a comprehensive neuropsychological protocol. On the other hand, a total of 216 participants (those between 40±2 and 65±2 years) completed a study of structural MRI. To carry out this study we used a discriminant analysis as multivariate approach.
Results: results showed age-related differences in the following cognitive domains: processing speed, visual episodic memory, procedimental memory, verbal fluency and premotor functions. Detection of age-related differences is associated to the size of the intervals of comparison. Interval size appearing to be 5 to 10 years. Regarding neuroanatomical measures (cortical thickness, white matter hypointensities, atrophy index and hippocampus volume) the size of the intervals of comparison being 10 to 15 years. When we studied the cognitive variables independently, most of them showed a critical point around 60-65 while for the neuroanatomical measures, specifically for cortical thickness, the critical point was around 55-60.
Conclusions: detection of cognitive and neuroanatomical differences associated with age showed a different pattern for both size of intervals of comparison needed for detection and critical point shown.
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Dying of Apathy: the prognostic value of apathy on mortality in Nursing Homes
Johanna MH Nijsten, Ruslan Leontjevas, Raymond TCM Koopmans, Debby L Gerritsen
Objective: determine the prognostic value of apathy on mortality in patients of somatic and dementia special care nursing home (NH) units.
Participants and Methods: secondary analyses of a two years cluster randomised trial with six time points in 33 NH units in the Netherlands. Baseline data were available for 688 nursing home patients (68% female). 327 (48%) of them resided in somatic care units, and 361 in dementia special care units. Apathy was assessed using the 10 item Apathy Evaluation Scale (AES) with cut-off scores of >29 in dementia, and >21 in somatic care patients. Additionally, depressive symptoms as a covariate was assessed using the Cornel Scale for Depression in Dementia.
Results: Mixed E□ects Cox Models adjusted for age, gender and type of NH unit revealed higher risk of mortality if apathy was present (Exp (β)=1.81, SE=0.14, p<0.001;coxme package in R). The results stayed significant (Exp (β)=1.51, SE=0.15, p<0.01) when controlled for depressive symptoms. Male gender(Exp (β)=1.56; SE=0.15p<0.05), and age in years (Exp (β)=1.05, SE 0.01, p<0.001) were significant mortality predictors but not the type of NH unit (p>0.05).
Conclusions: apathy in somatic NH patients as well as in demented NH patients is associated with increased mortality, even when accounted for depressive symptoms. Effective screening and treatment strategies should be developed and analysed for their effects on reducing mortality in patients.
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Czech normative data for older adults of Uniform Data Set neuropsychological test battery.
Tomas Nikolai, Hana Stepankova, Ondrej Bezdicek, Zdenek Sulc, Miloslav Kopecek,
Objective: The Uniform Data Set (UDS) is a neuropsychological test battery of the Alzheimer's Disease Centers program of the National Institute on Aging. The aim of the study was to present Czech normative data for older adults of the neuropsychological battery UDS. Additionally, we constructed a Czech version of a web-based calculator to support clinical use of the battery. The data were collected during the first year of a longitudinal project (National Normative Study of Cognitive Determinants of Healthy Aging (NANOK).
Participants and methods: The inclusion criteria consisted of age(60 years) and consensual anamnestic criteria. To avoid including persons with MCI or affective disorder, additional exclusion criteria were employed, which consisted of clinical assessment based on the Montreal Cognitive Assessment (MoCA), the 15-item Geriatric Depression Scale (GDS-15) and the Functional Activities Questionnaire (FAQ). Application of criteria listed above resulted in a normative sample of 540 healthy older adults (298 men, 242 women, age 60 - 98).
Results: As the effect of age and education was found, we present normative data for two subgroups in both mentioned variables: lower and higher age (60-75; 75+) and lower and higher education (8-12; 12+ years).
Conclusion: We presented normative data for older adults stratified by two levels of age and education for the Czech version of UDS neuropsychological battery. As a further matter we support the clinical use of the battery by means of the UDS web-based calculator.
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Patient Performance and Self-reported Functionality on the RBANS and WHODAS among elder adults on a psychiatric inpatient unit
Roxanna Rosen, Tammy Torres
Objective: To determine: (1) if lower levels of education correlate with lower scores on the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) and the World Health Organization Disability Assessment Schedule, 12-item version (WHODAS) in elder adults presenting to an inpatient unit with severe mental illness; (2) the effect of age; and (3) if WHODAS item S6 ("Difficulty concentrating ") correlates with RBANS Total Index score.
Participants and Methods: Subjects were males and females aged 59-80 presenting to an inpatient unit for severe mental illness with co-morbid symptoms of suicidal ideation, psychosis, change in cognitive status, depression or anxiety. Subjects were administered the RBANS and WHODAS measures.
Results: Correlation analyses were performed and results indicate that education and age were not significantly correlated to RBANS and WHODAS scores. No correlation was found between RBANS Total Index Score and self-reported WHODAS score to S6. In addition, items H2 ("How many days were you totally unable to carry out usual activities because of any health condition") and H3 ("How many days did you reduce your usual activities because of any health condition") in the WHODAS were significantly correlated.
Conclusions: Age and education did not impact subject's performance. Although there is a correlation between two WHODAS items, the results suggest that WHODAS scores are independent from the RBANS scores suggesting that additional measures are necessary to determine cognitive status.
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Executive Functioning Performance among older Cypriots with Depression Symptoms: Results from the Neurocognitive Study on Aging.
Artemis Stefani, Fofi Constantinidou
Objective: This study investigated late-life depression in relation to executive functioning (EF) in a large group of adults over the age of 60 as part of a longitudinal project, the Neurocognitive Study on Aging.
Participants and Methods: A total of 407 participants, who were community dwellers without a neurological history or diagnosis were included in the present analysis. Participants were grouped into two age groups (60-74 years old and 75+ years old) and into three education groups; low (0-4 years), middle (5-8 years) and medium-high (9+ years). Participants were assessed at baseline and at two year intervals. In addition to the Geriatric Depression Scale and the Mini Mental State Examination, participants were administered measures of executive functioning, memory, attention, and language.
Results: There were significant relationships between age, education and GDS with almost all the measures of executive functions. However, ANCOVA (a = .05), with depression as covariate, resulted in no significant interactions between age and education on EF performance and indicated significant effects of age and GDS, and, education and GDS on measures of EF. Performance was moderated by age and education levels.
Discussion: Depression hampers EF performance in aging. Old-old adults with low education levels perform worse and young-old adults with high education levels perform better than all the other groups. These patterns are also observed in healthy aging; however, depression symptomatology seems to add an additional burden to EF performance among older adults with lower education levels.
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Mild Cognitive Impairment - Poster Session 1 - 11.00 - 13.00		
Number	**Presenter**	**Poster Title**
20	Pilar Andres	In-Out test: diagnosis of mild cognitive impairment with a new cognitive paradigm
21	Elina Boycheva	Cognitive domains of the Mattis Dementia Rating Scale-2 for prediction of conversion to dementia in amnestic mild cognitive impairment
22	Alfonso Caracuel	The Addenbrooke's Cognitive Examination, ACE-III: a brief screening tool for mild cognitive impairment
23	Nidhi Dev	Predictive value of standard neuropsychological tests in amnestic mild cognitive impairment: A three year follow up study.
24	Adela Fendrych Mazancova	Frontal Assessment Battery: Validity in Parkinson's disease, mild cognitive impairment, and Czech normative data
25	Sara Fernández-Guinea	Cognitive phenotypes to differentiate between normal and pathological aging: The role of executive functions.
26	Sara Fernández-Guinea	What do executive functions tell us about the evolution of mild cognitive impairment?
27	Mau-Sun Hua	Deterioration and predictive values of semantic clustering in amnestic mild cognitive impairment
28	Masashi Odagiri	Subtle changes of functional ability in patients with mild cognitive impairment: quantitative analysis using an eye-tracking system
(29)	Marco Timpano Sportiello	Differences in memory profile between PD-MCI patients and MCI patients of different etiologies on the Wechsler Memory Scale-IV

In-Out test: diagnosis of mild cognitive impairment with a new cognitive paradigm
Pilar Andres, Verónica Lobera, Helena Vico, Catalina Llompart, Susana Tarongi, Ana Garcia, Eduardo Torrealba, Guillem Amer
Objective: The objective of this study was to investigate to what extent the In-Out test (Torrealba et al., 2012), a new test combining memory and executive load, would reveal differences between a group of patients with mild cognitive impairment (MCI) and a group of healthy controls.
Participants and methods: Twenty MCI patients recruited at the Cognitive Neurology Unit of the Son Espases University Hospital and 20 matched healthy controls were included in the study. All participants received the In-Out test, Mini Mental State Examination, 7-minute screen, forward and backward digit span, phonemic and semantic fluency and the clock tests.
Results: The results showed significant differences between MCI and control groups for all In-Out scores (total score, learning, serial recall and random recall). A 2 (group) x 2 (recall condition) also revealed a significant interaction, with greater differences between groups for serial than for random recall. There were however no significant differences in the clock drawing test.
Conclusion: To conclude, the In-Out test seems to be a useful tool to detect early forms of cognitive impairment, with a special deficit observed in serial recall in MCI patients.
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Cognitive domains of the Mattis Dementia Rating Scale-2 for prediction of conversion to dementia in amnestic mild cognitive impairment
Elina Boycheva, Israel Contador, Alberto Villarejo, Veronica Puertas, Bernardino Fernandez-Calvo, Francisco Ramos
Objective: To evaluate the utility of the cognitive domains of the Mattis Dementia Rating Scale-2 (MDRS-2) to discriminate people with MCI who converted to dementia from people with MCI who remained stable at one-year follow-up.
Participants and Methods: Thirty-seven patients with MCI were recruited from consecutive referrals to the University Hospital "12 de Octubre" (Madrid, Spain). Participants underwent a comprehensive neuropsychological assessment and the diagnosis of amnestic MCI (single and multi-domain) was established according to Winblad's criteria. A one-year follow-up was performed to monitor dementia conversion. Receiver operator characteristic (ROC) curves were used to examine the area under the curve (AUC) and optimal cut-offs for the MDRS-2 (global and subscales). Sensitivity (Sen), Specificity (Sp), positive and negative predictive values (PPV, NPV) were computed. A stepwise multiple regression analysis was performed to predict dementia conversion using MDRS-2 global and subscale scores.

Results: Eleven (29.7%) individuals with MCI (age=73.54±7.55) converted to dementia, and 26 (age=74.80±5.39) remained stable at one-year follow-up. The ROC curves showed that Memory (AUC = 0.88; Sen=91%, Sp=77%; PPV=0.61; NPV=0.95) was the best subscale to discriminate converters from non-converters (cut-off = 16/25), whereas the discrimination power of the MDRS-2 (global score) was poorer (AUC=0.69; Sen=63%, Sp=65%; PPV=0.42 NPV=0.81; cut-off=122/144). The stepwise regression showed that only Memory subscale significantly predicted conversion to dementia (R^2=.>37, F(1, 35)=20.64, p<.001).
Conclusions: The Memory subscale of the MDRS-2 could be a valuable instrument to discriminate MCI participants who convert to dementia from those who remain stable at one-year follow-up in a Spanish clinical sample.
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The Addenbrooke's Cognitive Examination, ACE-III: a brief screening tool for Mild Cognitive Impairment
Sandra Rute-Pérez, Lucía Álvarez-Gavito, María Vélez-Coto, Cristina Fernández, Laura Machado, Noelia Sáez-Sanz, Julia Beltrán, Alicia Cifuentes, Encarnación Sánchez-Lara, Alfonso Caracuel, Igor Bombín
Objective: to compare the psychometric properties and the discriminability power for cognitive impairment of the 3rdedition of the Addenbrooke's Cognitive Examination (ACE-III) and the Mini-Mental State Examination (MMSE)
Participants and Methods: A sample of 202 Spanish people aged 65 and over (101 healthy and 101 with MCI-Mild Cognitive Impairment) were assessed with the MMSE and the ACE-III altogether with a comprehensive neuropsychological battery, and a depressive symptoms scale. MMSE and ACE-III were compared between groups (healthy vs MCI) by means of student t. A step-wise regression analysis was conducted with ACE-III as dependant variable and neuropsychological battery cognitive domains summary scores as factors. In order to test discriminability, two binary logistic regression analyses were conducted with ACE-III and MMSE as independent variables; and the ROC curve was estimated for both variables.
Results: Both ACE-III and MMSE scores were higher on the healthy group than on the MCI group (p<0.001). Neuropsychological battery explained up to 73% of the ACE-III total score variance and 47% for the MMSE. Binary logistic regression put forward a 78.2% diagnostic accuracy for the ACE-III and 76.7% for the MMSE. The area under the ROC curve was 0.876 and 0.810 for ACE-III and MMSE, respectively. **Conclusion:** The ACE-III showed better psychometric properties and slightly higher discriminability power than the MMSE. The ACE-III showed to be more related to cognition than MMSE, which was more influenced by depressive symptoms. The influence of age in both measures suggests the need of developing age-adapted diagnostic cut-off scores.
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Predictive value of standard neuropsychological tests in amnestic mild cognitive impairment: A three year follow up study.
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Objective: The present study looked at the usefulness of standard neuropsychological tests in differentiating patients with amnestic mild cognitive impairment (aMCI) that progressed to develop Alzheimers disease (AD) or remained stable (non progressive MCI; npMCI).
Participants and Methods: Standard neuropsychological tests were administered to a group of aMCI patients (n=44), healthy controls (n=83) and patients with early AD (n =27). Patients were followed up for 3 years. At baseline all participants were tested on the Addenbrooke's Cognitive Examination- Revised (ACE-R), Auditory Verbal Learning Test (AVLT), Rey-Osterriths Complex Figure Test (ROCFT), visual association test (VAT), Trail Making Test (TMT – A & B), digit span test, verbal fluency, naming and the Brixton spatial anticipation test (BSAT). Performance at baseline was retrospectively analysed to differentiate aMCI patients who had either progressed (pMCI; n=20) to develop AD or remained stable (npMCI; n =24). One-way ANOVA and ROC curves were used to analyze data.
Results: The ACE-R total score (p= 0.025), ACE-R memory sub-component (p=0.00) and the VAT (p=0.00, 80% sensitivity) significantly differentiated between the pMCI and npMCI groups. While the AVLT and RCFT significantly differentiated the healthy controls from other groups, they were not able to differentiate between the pMCI and npMCI.
Conclusions: Our finding suggests that simple neuropsychological tests can be useful to identify patients with aMCI who progress to develop AD. This is relevant in developing countries as they are non-invasive, quick, cost-effective and easily available as compared to biomarkers. Early recognition is the key to therapy and carries prognostic implications.
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Frontal Assessment Battery: Validity in Parkinson's Disease Mild Cognitive Impairment and Czech Normative Data
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Objective: The Frontal Assessment Battery (FAB) is a short screening test of executive dysfunction and frontal behaviour. Executive functions are frequently impaired in Parkinson's disease (PD). The aims of the study were to determine the validity of the FAB in screening for mild cognitive impairment in PD (PD-MCI), and to provide normative data for cognitively normal Czech adults.
Participants and Methods: 301 healthy adults (aged 24–87) fulfilled inclusion criteria and were enrolled in the study to obtain Czech normative data. 17 Parkinson's disease patients (PD) assessed with Movement Disorders Society Neuropsychological Battery at Level II were classified as PD with no cognitive deficit (PD-ND; aged 45–81), 15 patients as PD mild cognitive impairment (PD-MCI) and 15 age and education-matched healthy controls (HC; both aged 52–82) were selected from normative sample for group comparisons.
Results: The FAB differentiated significantly PD-MCI from HC (p < 0.001) and PD-MCI from PD-ND (p = 0.014). An ROC curve analysis yielded an AUC of 89% (95% CI 75–100) for PD-MCI versus HC and of 75% (57–93) for PD-MCI versus PD-ND. We confirmed significant effects of age and education on the FAB performance in cognitively intact adults and report norms of the test as percentile values.
Conclusions: The FAB is a valid test for the screening of executive functions in PD since it significantly differentiates PD-MCI from PD-ND and even more from HC. Moreover, Czech normative data might increase the accuracy of the FAB in clinical practice.
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Cognitive phenotypes to differentiate between normal and pathological aging: The role of executive functions.
Sara Fernández-Guinea, Rafael Medina, Almudena Junquera, Lidia Sánchez, Beatriz Suárez, Mario Parra
Objective: The aim of this study is to analyze the role of executive functions in Mild Cognitive Impairment (MCI) construct, and their contribution to the identification of cognitive phenotypes which could distinguish between normal and pathological aging.
Methods: 127 subjects including controls (n=43), aMCI (n=20), maMCI (n=46) and naMCI (n=18) were evaluated with executive functions tests: flexibility (TMT B-A), working memory (Letters and Numbers, Mental Control), Inhibition (Go-no Go task), planning (Zoo test), fluency (FAS and Semantic), categorization (Similarities).
Results: There were statistically significant differences between control and MCI group in all executive functions measures. There also were statistically significant differences among MCI subgroups in all executive functions tests, except for Letters and Numbers and Similarities tests. The post hoc analysis showed that maMCI showed statistically significant worse performance in all tests. There were only statistically significant differences between maMCI and naMCI in Semantic Fluency and Zoo tests. Cluster analysis present three different MCI subgroups based on the severity of executive functions deficits (mild, moderate and severe). Mild executive function deficits group is composed mostly by aMCI patients, and severe executive function deficits group by maMCI patients. ANOVA among these executive functions subgroups revealed statistically significant differences in executive measures (Zoo test, Letters and Numbers and Verbal Fluency), MMSE, ACE, Lawton and Brody scale. There were a significant relationship among executive functions impairment, cognitive and ADL deficits.
Conclusions: Impairment in executive functions is identified among MCI patients. Executive functions profiles in MCI patients could define cognitive phenotypes of pathological aging.

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What do executive functions tell us about the evolution of Mild Cognitive Impairment?
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Objective: Impairment in executive functions (EF) is recognized among patients with Mild Cognitive Impairment (MCI). However, it is not well established dissociations among EF subcomponents in MCI, or their involvement in cognitive evolution of MCI patients.
Participants and Methods: A two-year longitudinal study with annual monitoring assessments was carried out. 16 controls, 11 aMCI, 22 maMCI and 9 naMCI people were evaluated by a comprehensive neuropsychological battery including MMSE, Lawton and Brody scale, and executive functions tests: flexibility (TMT B-A), working memory (Letters and Numbers, Mental Control), Inhibition (Go-no Go tasks), planning (Zoo test), fluency (FAS and Semantic Fluency), categorization (Similarities).
Results: There were statistically significant differences between control and MCI group in all executive functions measures in the first year. At this time, there were statistically significant differences among MIC subgroups in Mental Control, Semantic Fluency and TMT B-A tests. The post hoc analysis showed that maMCI subgroup showed the worse performance. A mixed repeated measures ANOVA between first and second assessments in executive functions, MMSE and Lawton and Brody measures revealed that only maMCI showed statistically significant worse performance in MMSE and executive function tests (Similarities, Letter and Numbers). aMCI present statistically significant better results in Letters and Numbers, and Controls showed statistically better performance in Semantic Fluency.
Conclusions: There are dissociations among EF subcomponents in MCI, and some of them (working memory and categorization) are associated with cognitive deterioration evolution. There is a relationship between initial EF profile deterioration and the progress of cognitive decline longitudinally evaluated.
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Deterioration and Predictive Values of Semantic Clustering in Amnestic Mild Cognitive Impairment
Hsin-Te Chang, Ming-Jang Chiu, Ta-Fu Chen, Meng-Ying Liu, Wan-Chun Fan, Ting-Wen Cheng, Ya-Mei Lai, Mau-Sun Hua
Objective: Few previous researchers have investigated changes in semantic representations with different loadings on various features among patients with amnestic mild cognitive impairment (aMCI).
Participants and Method: This study examined the clustering performance in semantic fluency among 160 participants in various MCI subgroups as well as a group of mildly impaired individuals with dementia of Alzheimer's type (DAT), and a group of healthy controls (HC).
Results: Compared with the HC group, DAT patients presented deficient clustering in each semantic category related to living things. The aMCI single domain (aMCI-sd) group presented defective clustering when dealing with the clustering of items that may be more strongly associated with action and perceptual information in the categories that included inanimate living things. The aMCI multiple domain (aMCI-md) group displayed defective patterns similar to those in the aMCI-sd group; however, they displayed more profound deficits in clustering of items that may require perceptual information. Patients with non-aMCI multiple domain (naMCI-md) preserved their ability to perform clustering on all of the categories. The poor clustering of items that may be more strongly associated with action could be used as a means of predicting conversion from aMCI-sd to DAT, whereas performance on items that may require perceptual information could be used to predict conversion among aMCI-md patients.
Conclusions: These findings demonstrate the degree to which the clustering performance in semantic fluency tasks can be used for the assessment of aMCI patients and prediction of conversion to DAT.
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Subtle changes of functional ability in patients with mild cognitive impairment: quantitative analysis using an eye-tracking system
Masashi Odagiri, Hajime Takeuchi, Toshihiko Aso, Chihiro Namiki, Keita Ueda
Objective: To investigate subtle changes in the functional ability of people with mild cognitive impairment (MCI), the visual searching process was examined. We focused on very short fixations (VSF). The duration of VSF is much shorter than the time required to program a new saccade, and it is considered as an index of concurrent preprograming of multiple saccades in the target space coordinates.
Participants: Four amnestic MCI patients and 15 age-, sex-, and education-matched healthy controls. Methods: Neuropsychological batteries and four simplified instrumental activities of daily living (IADL) tasks were performed. IADL tasks were performed three times wearing an eye-tracking system. The data extracted were as follows: number of errors, performance time, eye movement distance, number of fixations, and ratio of VSF (number of VSF/total number of fixations on each task). Repeated measures ANOVA (condition: Group*Task*Trial) and non-parametric tests were performed on the IADL data and neuropsychological test scores, respectively.
Results: Only memory scores showed a significant decline in neuropsychological scores. In IADL task data, the main effect of group was found to be ratio of VSF. Post hoc analysis showed a significantly larger number of VSF in MCI patients. The other IADL data did not show significant differences between groups.
Conclusions: The increased VSF ratio associated with MCI may indicate a compensatory mechanism for memory dysfunction. The underpinning neural mechanism might be a temporarily overactive state of the prefrontal cortex, previously reported by many researchers. The eye movement analysis may capture subtle and preceding changes of procedural memory in IADL.
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Medical/Neurological Disorders (Adult) - Poster Session 1 - 11.00 - 13.00		
Number	**Presenter**	**Poster Title**
33	Stuart Anderson	Neuropsychological outcome of cerebral malaria: An adult case study
34	Linda Byrne	A meta-analysis and systematic review of the effects of deep brain stimulation (DBS) on cognition
35	Benjamin Deck	The cognitive profile of statin users in Parkinson Disease
36	Irati Esnal	Prolonged mechanical ventilation is associated with verbal memory worsening in ICU survivors at hospital discharge
37	Sol Fernandez-Gonzalo	Neurocognitive and psychopathological sequelae in medical and surgical critically ill survivors: the relationship with clinical variables during ICU stay
38	Maite Garolera	Body Mass Index and subjective anxiety as predictors of worse cognitive outcome
39	Maite Garolera	Subtle frontal deficits in young adults with familial hypercholesterolemia
40	Yen-Hsuan Hsu	White matter degradation of the anterior thalamic radiation correlates with encoding deficit in cerebral small vessel disease: a preliminary diffusion tensor imaging study
41	Lenka Kramska	Cognitive performance in primary Whipple's disease of the brain – a case report
42	John Lucas	Long-term verbal fluency and verbal memory outcomes following left-side tandem and single-target deep brain stimulation in Parkinson's disease
43	Linda Monaci	Exploring the psychometric proprieties of the Personal Problems Questionnaire in a sample of chronic pain patients and in a healthy community norming sample
44	Eva	Diabetic neuropathic pain: catastrophizing

	Nekvapilova	as a predictor of pain intensity and disability

Neuropsychological outcome of cerebral malaria: An adult case study.
Stuart Anderson, Liya Suvorova, Tina Good
Objective: Cerebral malaria is the most severe neurological complication of infection with *Plasmodium Falciparum* malaria. As a clinical syndrome, it carries a high mortality and risk of brain injury. Long-term neurocognitive impairment may be seen in some survivors but there are few published accounts in the adult neuropsychological literature. This case report documents the neurocognitive outcome of cerebral malaria in an adult survivor.
Participants and Method: Adult female diagnosed with cerebral malaria shortly after returning to Europe from Africa. She had taken a prophylactic medication which she ceased taking on leaving Africa. Within days she became unwell and was hospitalised in a critically ill condition with a high parasitic load. She remained in ICU for a month and sustained neurological injury including cognitive deficit. Neuropsychological assessment was undertaken 2.5 years following onset using an abbreviated version of the *Neuropsychological Assessment Battery (NAB)* proposed by Iverson & Brooks (2011).
Results: A range of subjective complaints were reported. Psychometric profiling revealed underperformance on tests of information processing, new learning (especially non-verbal) and executive function. In contrast, she was above average on tests of visuospatial processing and there was no evidence of impaired intellectual ability. Neuroimaging was normal.
Conclusion: The cognitive deficits associated with unresolved neurological injury in cerebral malaria are likely to be variable owing to variability in the possible mechanisms of brain injury. This case study presents the long-term outcome in an adult survivor and contributes to our knowledge of cognitive deficits associated with parasitic disease.
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A meta-analysis and systematic review of the effects of Deep Brain Stimulation (DBS) on cognition
Linda Byrne, Tomas Cartmill, David Skvarc, Jane McGillivray, Susannah Tye, Michael Berk, Richard Bittar
Objective: The objective of this meta-analysis was to analyse the literature regarding the effects of bilateral STN DBS for Parkinson's disease on cognition (pre- versus post-DBS).
Participants and Methods: An electronic literature search complemented by manual searching was performed to gather data on studies reporting changes in the areas of cognition, mood and motor function (or any combinations of these three) post DBS surgery. Focus was particularly directed to those studies reporting both pre and post-surgical measures across these domains.
Results and conclusions: There is now a large literature relating to the effects of bilateral STN DBS on cognition. For the most part effect sizes for cognitive decline post-DBS are either absent or relatively small. The exception is in the area of verbal fluency. Almost all studies employing fluency measures show that both phonemic and semantic fluency decline post DBS surgery when the STN is the target, and the effect sizes are in the moderate range. Comprehensive prospective research studies would add valuable new data on the neurobiological mechanisms mediating DBS-induced alterations in cognitive function.
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The Cognitive Profile of Statin Users in Parkinson Disease
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Objective: Evaluate the association between statin use and cognition in Parkinson Disease (PD) and characterize the cognitive profile of PD statin users.
Background: PD patients are at an increased risk for developing cognitive impairment; particularly executive deficits. Statin use in Alzheimer disease suggests a possible protective effect on cognition, yet this relationship has not been examined in PD.
Methods: A detailed neuropsychological battery assessing global cognition, attention, executive functioning, and memory was administered and medication were logs collected from 314 PD patients (Statin-users (SU, n=130), Non statin-users (NSU, n=184).
Results: SU were older at PD onset (t=-3.0, df=312, p=0.003), assessment (t=-2.1, df=298, p=0.04), and had a shorter disease duration, compared with NSU (t=2.0, df=312, p=0.05). Controlling for these variables and sex, SU performed better on the Montreal Cognitive Assessment (MoCA) (t=2.2, df=128, p=0.03). In addition, SU performed significantly better on the clock-drawing task (t=2.4, df=290, p=0.02), semantic (t=2.8,df=268,p=0.006) and phonemic fluency(t=2.8, df=230, p=0.006), and Letter-Number Sequencing test (t=2.0, df=278, p=0.05). Additionally, specific cognitive domain subtests of the Dementia Rating Scale (DRS-2) that were significantly better in SU were initiation (t=2.0, df=313, p=0.04) and construction (t=0.05, df=313, p=0.05).
Conclusion: Statin use in Parkinson disease is associated with better performance on measures of global cognitive, visuo-spatial, and executive abilities. Randomized studies are needed to determine if statin use has a cognitive protective effect in PD.
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Prolonged mechanical ventilation is associated with verbal memory worsening in ICU survivors at hospital discharge
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Introduction and Objective: Advances in the Intensive Care Units (ICUs) have led to increased proportion of patients surviving an episode of critical illness. However, neurocognitive impairments have been shown among survivors as a potentially important health burden after hospital discharge. Mechanical ventilation (MV) could be an important risk factor, closely related to neurocognitive impairments because it triggers the release of inflammatory mediators that can spread to the brain. Since increased level of cytokines has been associated with memory impairments in healthy subjects, the objective of this study is to explore the association of the duration of MV during ICU with memory function after hospital discharge in a sample of critically ill patients.
Participants and Methods: Twenty-nine mechanically ventilated patients were prospectively followed during their ICU admission. At hospital discharge, patients were assessed for memory function by means of the RAVLT and BVRT. Bivariate correlations were used to explore the association of days of MV and memory scores.
Results: 22 male (75.9%) and 7 female (24.1%) critically ill patients with a mean age of 65.68±10.87yrs were intubated during 8.66±6.94 days. Bivariate analysis showed association between *days of MV* and *verbal short-recall* (r=-.453;p=.01), *verbal recognition* (r=-.379;p=.03), and a significant trend with *verbal learning* (r=-.328;p=.07). No significant associations were noted between *duration of MV* with *visual memory* scores.
Conclusions: Prolonged mechanical ventilation can contribute to cause long-lasting neurocognitive impairments, especially on verbal memory. Inflammatory mechanisms of MV-induced memory decline should be further studied in future research.
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Neurocognitive and Psychopathological Sequelae in Medical and Surgical Critically Ill Survivors: The Relationship With Clinical Variables During Icu Stay
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Objectives: To study the neurocognitive and psychopathological status in critically ill survivors and its relationship with clinical variables during ICU stay.
Participants&Methods: 16 critically ill patients without previous cognitive decline were followed during their ICU stay. Severity of illness (SOFA) at admission, days of stay, intubation, sedative drugs, and delirium were registered. A comprehensive neurocognitive assessment, including anxiety and depression symptoms (HADS), was administered 1-month after ICU discharge. Indexes of Attention,

Memory (Learning, Recognition and Working Memory -WM-), Speed of Processing (SP) and Executive Function (EEFF) were calculated in Z scores.
Results: Patients scoring between 1 and >2 standard deviations under the mean were observed in all cognitive variables (Attention:18.75%; Learning&Memory:37.5%; Memory_Recognition:37.5%; WM:12.5%; SP:81.25%; EEFF:87.50%). Depressive symptoms appeared in 50% of the sample. Attention (Median: -0.05, Rank: -1.05 to 1.45) and WM(-0.74; -3.5-0.3) were the most preserved cognitive domains at ICU discharge while EEFF (-1,65; -3.8 to 0.5) and SP (-2.13; -4.4 to 0.8) were the most affected. Significant correlation was found between presence of Delirium and EEFF (p=0.05) and trends to signification were observed between presence of delirium and depressive symptoms (p=0.07) and days of sedative treatment and attention (p=0.08).
Conclusions: ICU survivors are vulnerable to present neurocognitive deficits in multiples cognitive domains, specifically in SP and EEFF, and depressive symptoms. Although other clinical aspects (such as mechanical ventilations variables) should be further studied, delirium as well as sedation treatment could influence the long-term cognitive and psychopathological outcome of these patients.
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Body Mass Index and subjective anxiety as predictors of worse cognitive outcome
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Objective: Obesity is a complex health problem where constant efforts to assure system homeostasis may lead to a physiological stress-related status known as "allostatic load". Both chronic stress and obesity are associated with neuroanatomical changes in the hippocampus or prefrontal cortex, which may compromise cognitive function. Obesity and stress joint effects on cognition are largely unexplored, leaving scope for the present study.
Participants and Methods: We recruited 104 healthy subjects aged 18 to 40 years (66.3% women; 46.2% obese). First, we performed principal component analysis to extract cognitive domains from a large neuropsychological evaluation. Second, we conducted hierarchical multiple regressions to test whether (i) demographic data (age, IQ estimation), (ii) obesity-related variables (BMI, abdominal perimeter, and leptin), (iii) and stress-related variables (cortisol concentrations, subjective anxiety) could predict performance in each of the cognitive domains.
Results: Obesity and stress-related variables were significant ($F_{7,103}$= 3.730, p=.001, R^2=.202) as a predictor model in a component representing bad scores in general cognitive function. Higher BMI and anxiety predicted worse cognitive outcome. Conversely, higher general intelligence and leptin concentrations predicted better cognitive performance.
Conclusions: Whilst obesity and anxiety may be related to a worse cognitive performance, our findings suggest that obesity may not only be associated with lower cognitive outcome: increases in leptin concentrations were related to better outcomes - perhaps reflecting that leptin can act as a neuroprotective factor. Future research is needed to evaluate neuroanatomical differences mediating the effect of obesity and stress on cognitive function.
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Subtle Frontal Deficits in Young Adults with Familial Hypercholesterolemia
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Objectives: Familial Hypercholesterolemia (FH) is an autosomal dominant disorder resulting an increase risk of cardiovascular disease and constitutes a risk factor for developing white matter disease and executive function alterations. The aim of this research is to determine whether young adults with FH show abnormal frontal function and its relation with cholesterol serum levels (LDL-c serum)
Participants and Methods: We recruited 18 patients with FH (ages 18 to 40; diagnosis verified by genetic testing) and 18 controls (matched by gender, age, and education). None of the participants had history of stroke or disorder that could affect cognition. Clinical and laboratory determinations, and neuropsychological tests sensitive to frontal functioning were administered (N-Back; TMT A and B and FAS). We performed t-test to assess group differences in frontal variable and Pearson's correlation to determine any relationship Total LDL-c serum and neuropsychological variables.
Results: Relative to controls, patients with FH showed poor performance in one of the working memory tasks (mean RT N-back2: p=0.016). Among FH, those who showed higher LDL-c serum level exhibited more commission errors in a high difficulty working memory task (N-Back3 commission errors: p=0.027) ,as well as, poor executive control (TMT B-A p=0.039). Their LDL-c serum levels also showed positive correlation with commission errors in working memory execution (N-Back3 commission errors: p=0.005).
Conclusions: The results indicate the existence of subtle neuropsychological impairments in some frontal sensitive tasks, such as working memory and executive control in young adults with FH and an association with their cholesterol levels, especially with LDL-c.
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White matter degradation of the anterior thalamic radiation correlates with encoding deficit in cerebral small vessel disease: a preliminary diffusion tensor imaging study
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Objective: Memory impairment related to cerebral small vessel disease (SVD) is often considered secondary to frontal-related encoding and retrieval processes. However, correlations between cognitive deficits and macrostructural white matter lesions were only modest. We attempted to delineate the corresponding fiber microstructural changes in SVD.
Participants and Methods: Nineteen patients with SVD and 18 demographically matched controls received the Chinese version of the Verbal Learning Test, from which indices of encoding efficiency and retrieval difficulty were derived. Diffusion tensor imaging (DTI) parameters, the mean diffusivity (MD) and fractional anisotrophy (FA), were measured in the superior longitudinal fasciculus (SLF), uncinate fasciculus, anterior thalamic radiation, cingulum, genu, body, and splenium of the corpus callosum.
Results: Compared to the controls, the SVD group showed significantly worse encoding efficiency, more retrieval difficulty, as well as higher MD and lower FA in all regions of interest except the right uncinate fasciculus and the left cingulum. With all data combined, encoding efficiency was remarkably related to both FA and MD values of bilateral anterior thalamic radiation, the right SLF, and genu of the corpus callosum; retrieval difficulty was related to both DTI parameters of the left anterior thalamic radiation. In the SVD group, encoding efficiency was specifically related to degradation of the left anterior thalamic radiation.
Conclusions: The DTI findings confirmed the role of frontal-subcortical circuits in encoding and retrieval processes. In patients with SVD, disruption of the left anterior thalamic radiation may serve as a biomarker of encoding deficiency during verbal learning.
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Cognitive performance in primary Whipple's disease of the brain – case report
Lenka Kramska, Jan Peregrin, Hana Malikova
Objective: Whipple's disease is a very rare systemic disease caused by the bacteria *Tropheryma whipplei*. We report the case of a patient with the primary CNS form of Whipples's disease and we highlight cognitive performance and diagnostic procedures that lead to the diagnosis.
Methods: 44 years old woman has been followed up for 12 years. At the time of diagnosis, no cognitive and neurological symptoms were present. The first neurological manifestations developed during 2005, 2 years later despite recommended antibiotic treatment. Neuropsychological testing was performed 3 and 9 months after last hospitalization (December 2014) when cognitive problems were observed. We used RBANS, Verbal Fluency test and BDI-II.
Results: Cognitive impairment developed more than 10 years after the diagnosis was established. According to the family, patient was fully self-sufficient until November 2014. Mean performance 3 and 9

months after last hospitalization using RBANS A/B was: Immediate memory 53/61, Visuospatial/Constructional 89/100, Language 97/100, Attention 79/82, Delayed Recall 64/48, Total Scale 70/72. Patient suffered from retrograde amnesia (several months prior to the last episode), mood and affective disorders. MRI showed diffuse brain atrophy and severe atrophy of the right hippocampus with hippocampal sclerosis.
Conclusions: Despite appropriate antibiotic treatment recommended at that time, we observed several episodes of disease progression. More than 10 years after the diagnosis we observed moderate to severe cognitive decline from the premorbid performance level, significant personality and emotional changes. Early diagnosis is crucial, in which neuroimaging as well as brain biopsy and cognitive testing may be helpful.
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Long-term verbal fluency and verbal memory outcomes following left-side tandem and single-target Deep Brain Stimulation in Parkinson's disease
Adam Parks, Ryan Uitti, Robert Wharen, John Lucas
Objective: Single-target deep brain stimulation (DBS) of the subthalamic nucleus (STN) or internal globus pallidus (GPi) is the preeminent neurosurgical treatment for medically-intractable Parkinson's disease (PD). The Veterans Affairs Cooperative Studies Program recently found equal improvement in motor symptoms regardless of surgical target, but also found equal decrements in long-term (24mos.) cognitive functions. DBS to the fornix/hypothalamus has recently been shown to yield improved memory and slowed progression of cognitive decline in Alzheimer's disease. The current study examined whether tandem (GPi+fornix) stimulation in PD patients yields superior long-term cognitive outcomes compared to single-target (STN or GPi) DBS.
Participants and Methods: Seven PD patients (Mean age = 64.6yrs.) underwent neuropsychological testing, including Controlled Oral Word Association, Semantic Fluency, and Hopkins Verbal Learning Test, before and after left-hemisphere tandem (n=2) or single-target (n=4 STN, n=1 GPi) DBS surgery (mean interval = 22mos.). Differences in cognitive outcomes within the treatment groups were examined using related-samples Wilcoxon Signed Rank analyses.
Results: Compared to baseline, tandem DBS patients demonstrated significantly better postoperative outcome in learning efficiency, whereas the single-target DBS patients did not. A similar finding was noted for delayed recall, which approached but did not reach statistical significance. No postoperative differences were found on verbal fluency scores.
Conclusions: Results provide preliminary support for the utilization of tandem DBS targets in treating PD, given the potential benefit to learning and memory compared to single-target procedures. Larger, well-controlled studies are required to replicate these findings and explore benefits to other areas of cognition and everyday functioning.
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Exploring the psychometric proprieties of the Personal Problems Questionnaire in a sample of chronic pain patients and in a healthy community norming sample
Linda Monaci, Martin van den Broek, Jared Smith
Objective: This study investigated the psychometric properties of a new questionnaire, the Personal Problems Questionnaire (PPQ), which aims to screen for cognitive, emotional and physical symptoms and identify patients who present with non-valid symptoms.
Participants and Methods: Demographic data was collected from 77 participants with chronic pain. The PPQ was administered alongside the Short Form McGill Pain Questionnaire (SF-MPQ; Melzak, 1987) and the Medical Symptom Validity Test (MSVT; Green, 2004). A subsample (n=27) also completed the Personality Assessment Inventory (PAI; Morey, 2007). Secondary analysis was performed on a normative sample community participants (n=410) to explore the PPQ's underlying factors and internal reliability.
Results: The internal reliability of the PPQ's scales was good in the chronic pain sample (α>0.80) and in the normative community sample (all scales, but one α>0.70). Concurrent and discriminant validity for several clinical and for all the validity scales of the PPQ was supported by exploring their association with the PAI, SF-MPQ and MSVT. The PPQ validity cognitive and physical validity scales were associated with failure on the MSVT; the emotional validity scale was able to predict scores on the PAI validity scales. Separate exploratory factor analysis on the PPQ scales in the clinical and healthy controls norming samples identified two factors.
Conclusions: The PPQ is the first British-developed self-report questionnaire that includes measures of symptom validity. The results of this study suggest that the PPQ holds promise in the assessment of emotional, physical and cognitive symptoms.
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Diabetic neuropathic pain: catastrophizing as a predictor of pain intensity and disability
Eva Nekvapilova, Petra Valkovska, Eva Vlckova, Josef Bednarik
Objective: Neuropathic pain may be both severe and disabling, often presenting a challenging clinical problem. Apart from functional limitations, individuals who suffer from it commonly report depression or anxiety. Pain catastrophizing has been consistently implicated as an explanatory construct for pain-related disability and emotional problems. However, the mechanisms involved in the co-morbidity of pain and emotional disorder remain unclear. Knowledge of the specific components of catastrophizing that may contribute to increased pain experience is also sparse.
Methods: Sixty patients with diabetic peripheral neuropathic pain (30 males) and 60 patients with painless diabetic neuropathy (31 males) were examined by means of self-report. Participants completed the pain catastrophizing scale (PCS, tracing dimensions of rumination, magnification, helplessness), the Beck depression inventory (BDI-II) and the state-trait anxiety inventory (STAI-Y). The graded chronic pain scale (CPGS) was used to assess pain intensity and disability.
Results: Patients with neuropathic pain scored higher in levels of depression and anxiety state in comparison with patients without it. They also reported higher anxiety trait and more frequent catastrophizing cognition. Regression analysis revealed that the rumination subscale of catastrophic thinking was the only dimension of PCS that significantly predicted the level of reported pain intensity and disability in the group of patients with diabetic neuropathic pain.
Conclusions: Results confirm frequent emotional distress in neuropathic pain patients and reveal that the rumination dimension of pain catastrophizing might be a particularly important determinant of pain experience. Early assessment and modification of these factors may reduce disability and contribute to optimizing treatment response.
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Medical/Neurological Disorders (Child) - Poster Session 1 - 11.00 - 13.00		
Number	**Presenter**	**Poster Title**
45	Laurie-Anne Dion	Sex-specific effect of long-term exposure to manganese in water on IQ in adolescents.
46	Anna Hood	A meta-analysis of cognitive deficits in children with sickle cell disease: the impact of cerebrovascular disease
47	Georgia Pitts	Damage to subcortical white matter microstructure after severe and recurrent hypoglycaemia
48	Susan Rose	Towards understanding the cognitive phenotype of Rett's Syndrome
49	Susan Rose	Attention in children with Rett Syndrome: Anticipatory and reactive saccades
50	Robyn Stargatt	Behavioural executive function in pre-school children with cerebral palsy
51	Emily Talbot	Acute disseminated encephalomyelitis (ADEM) in childhood: A case series

Sex-specific effect of long-term exposure to manganese in water on IQ in adolescents.
Laurie-Anne Dion, Dave Saint-Amour, Benoit Barbeau, Sébastien Sauvé, Donna Mergler, Maryse Bouchard
Objective: Manganese (Mn) is an essential nutrient, but excessive exposure is neurotoxic. We previously showed that water Mn concentration was associated with decreased IQ in school-age children. These findings prompted the adoption of water treatment to

reduce Mn concentration in drinking water. Our objective was to reassess this cohort at adolescence.
Participants and Methods: Among the 380 initial study participants, 287 were followed-up (mean age, 13.6 years ±1.8). We used Weschler Abbreviated Scale of Intelligence (WASI) to assess Full-scale, Verbal and Performance IQ. We sampled drinking water at 2 time points spaced 4.5 years apart, measured Mn concentration, and calculated mean Mn exposure for this time period.
Results: Regression analyses showed that Full-scale, Performance or Verbal IQ were not associated with Mn exposure in the entire group ($p > 0.2$). However, sex-stratified analyses revealed that Mn exposure in girls was significantly associated with lower Full-scale IQ ($\beta = -2$, $p = 0.05$) and Performance IQ ($\beta = -2.7$, $p = 0.02$), but not with Verbal IQ ($\beta = -1.2$, $p=0.33$). Girls in the highest quartile of Mn concentration had an average of 102 Performance IQ points compared with 96 in the lowest quartile. No association was found for boys ($p > 0.2$).
Conclusions: These results support the hypothesis that long-term exposure to Mn through drinking water is associated with lower IQ, particularly Performance IQ, but only in adolescent girls. Such a sex difference suggests that dynamics and kinetics of environmental contaminants' metabolism can be different between adolescent boys and girls.
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A meta-analysis of cognitive deficits in children with sickle cell disease: the impact of cerebrovascular disease
Anna Hood, Desiree White
Objective: Children with sickle cell disease (SCD) suffer from numerous clinical complications including cerebral infarcts. Cognitive deficits occur in children with SCD who experience cerebral infarcts and interestingly, deficits also occur in children with no evidence of cerebral lesions. In order to clarify the role of cerebrovascular disease we performed meta-analyses of peer reviewed published studies focused on cognition in this vulnerable population.
Participants and Methods: The most commonly used measure of cognition across studies is the global intelligence quotient (IQ). Many studies report verbal and perceptual reasoning abilities, which represent major components of overall IQ. A smaller number of studies have measured processing speed abilities. We conducted meta-analyses of 64 studies assessing IQ, verbal and perceptual reasoning, and processing speed abilities to quantify differences between children with SCD and matched controls.
Results: We found reliable medium effect sizes (Cohen’s d = .46 – .56) for comparisons between children with SCD and controls for all cognitive measures with severity of neurologic complications predicting poorer cognitive performance. In fact, across studies, overt stroke predicted a loss of around 20 standard score points for IQ, verbal, and perceptual reasoning abilities.
Conclusions: These results indicate cognitive deficits are related to severity of neurological complications in children with SCD and are associated with meaningful decrements in IQ, verbal and perceptual reasoning, and processing speed abilities. Our findings suggest that more cognitive and medical interventions are necessary in order to reduce the significant effects of this chronic illness on cognition in children with SCD.
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Damage to subcortical white matter microstructure after severe and recurrent hypoglycaemia
Georgia Pitts, Anitha Kumaran, Khalid Hussain, Jemima Bullock, David Gadian, Faraneh Vargha-Khadem
Objective: Children with hyperinsulinism (HI) experience severe and recurrent hypoglycaemia as neonates and infants. While it is well established that those who experience such events early in life are at risk of brain damage, little is known about the long term consequences of these episodes. Furthermore, there is a dearth of studies investigating late effects of hypoglycaemia in school-aged children who are free from diagnosed neurological disorders.
Participants and Method: We assessed 30 children with HI (age range 8-16 years, mean=10.89±2.47) and 30 healthy controls (age range: 8-17 years, mean=11.14±2.65). Patients completed a series of cognitive and motor examinations. To assess white matter integrity, we conducted a whole brain analysis using Tract Based Spatial Statistics (corrected for multiple comparisons using threshold-free cluster-enhancement).
Results: Compared to standard population means, patients had significantly lower full scale IQ, working memory, processing speed, spelling and mathematical proficiency, attention and fine motor skills ($p<0.001$). Reductions in Fractional Anisotropy (FA) were observed in the anterior thalamic radiations (bilateral), and brain stem (including the left cerebellar peduncles) ($p<0.05$). A trend was observed for reduced FA in the right splenium of the corpus callosum, left internal capsule and left fornix.
Conclusion: These data show disruption to subcortical white matter microstructure in children with HI. Subcortical tracts serving motor functions appear especially compromised, consistent with a profile of restricted fine motor skills. In addition, there is evidence of impairment in a number of cognitive domains. The link between altered white matter microstructure and long term cognitive outcome warrants further investigation.
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Towards Understanding the Cognitive Phenotype of Rett Syndrome
Susan Rose, Aleksandra Djukic, Jeffery Jankowski, Judith Feldman
Objective: Rett syndrome(RTT), a severely disabling neurodevelopmental disorder caused by spontaneous mutations in the x-linked MECP2 gene, affects 1:10,000 females. Assessments of cognitive functioning have been extremely difficult because patients with RTT are nonverbal and have no or little purposeful hand use. We have pioneered using state-of-the-art eye-tracking technology to bypass these limitations and reveal the disorder's cognitive phenotype.
Participants and Methods: Testing more than 100 genetically confirmed RTT patients, and their typically developing counterparts (TD), we have: (1) established the feasibility of using this new technique with RTT, (2) examined the extent to which memory is affected (as shown by visual preference for a novel target over a familiar one) and (3) delineated aspects of attention that are compromised.
Results: Children with RTT were able to recognize simple patterns, faces, and some emotional expressions (i.e., novelty scores were significantly above chance), although their performance was significantly poorer than that of TD children. An especially striking finding were the *atypical patterns of attention*, characterized by fewer and longer fixations, poorly distributed looking, less looking to key target areas (e.g., over 40% totally ignored the lower part of the face), and a striking absence of anticipatory/predictive saccades. Deficits in attention correlated with poorer recognition.
Conclusion: This new work indicates that the cognitive world of RTT can be unlocked and explored by using visually based tasks. It also holds promise for informing the design and assessment of therapeutic interventions that could improve the quality of life for those with RTT.
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Attention in Children with Rett Syndrome: Anticipatory and Reactive Saccades
Susan Rose, Aleksandra Djukic, Jeffery Jankowski, Judith Feldman, Menachem Rimler
Objective: To assess two aspects of attention (shifting and sustaining) in Rett syndrome(RTT), a severely disabling neurodevelopmental disorder caused by spontaneous mutations in the x-linked MECP2 gene. Using eye-tracking, we bypassed the profound impairments in expressive language and hand use that previously precluded testing these children. Attention was singled out because of its pivotal role in driving cognitive growth.
Participants and Methods: There were 20 genetically confirmed RTT children and 14 typically developing(TD) children (3-16 yrs). The paradigm involved a series of trials where a central attractor appeared, along with two empty windows, one on either side. The attractor disappeared after 2000ms. After a 1000ms delay, an animated target appeared in the window on the right, remaining there for 4000ms.
Results: *Shift Times* to turn from the attractor to the target location were significantly longer for the RTT children than the TD group: $F(1, 27)=24.49$, $p< .00$. This effect was due largely to the RTT group

having markedly fewer *Anticipatory Saccades* than the TD group (18% vs 57%), $t(32)=5.80$, $p < .001$. *Reactive Saccades*, shifts after the target appeared, were also longer for RTT, but not significantly so. *Sustained Attention*, while greater for the TD group, $F(1,27)=12.15$, $p=.002$, was also relatively high for both groups (75% and 90%).
Conclusion: While RTT children could sustain attention, and reacted relatively quickly to the appearance of an engaging target, they had great difficulty in anticipating its appearance, an aspect of endogenous attention important for executive functioning.
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Behavioural Executive Function in Pre-School Children with Cerebral Palsy
Robyn Stargatt, Sarah Sherwell, Sue Reid, Jacquie Wrennall, Ben Ong, Dinah Reddihough
Objective: The aim of this study was to characterise behavioural executive functions in a population based group of preschool-age children with congenital spastic Cerebral Palsy (CP) according to topographical distribution of motor impairment.
Participants and Methods: Parents of Sixty-three Preschool-aged children with unilateral and bilateral spastic CP completed the Behavioral Rating of Executive Function-Preschool Version (BRIEF-P). Results were compared with the standard norms using one-sample *t*-tests. ANOVAs compared topographical distribution groups. The percentages of cases with impaired scores were calculated (mild impairment = 1.0 to 2.0 *SD* < M; and significant impairment > 2.0 *SD* < M).
Results: The CP group scored significantly higher than the normative sample on the GEC, indicating greater behavioural executive dysfunction, $t(58) = 5.85$, $p < .001$, $h^2 = .37$ and on all five domains of the GEC. No significant differences between groups were found.
The whole CP group displayed almost five times the expected rate of impairment of behavioural executive functions. Working memory was the most impaired with almost 50% of the sample scoring above the cut-off for impairment, approximately seven times the expected rate. Planning and Inhibition were the next most impaired functions with approximately 25% of the sample scoring within the impaired range.
Conclusions: Children with CP are at a high risk of significant impairment of executive function. This finding is consistent with the early vulnerability hypothesis and has significant implications for pre-school children and should be used to inform school-based education, remedial programs and support requirements.
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Acute Disseminated Encephalomyelitis (ADEM) in childhood: A case series
Emily Talbot, Cathy Grant, Darren Reynolds, Arleta Starza-Smith
Objective: Acute disseminated encephalomyelitis (ADEM) is an acute multi-focal inflammatory demyelinating condition affecting the central nervous system (CNS). ADEM predominantly affects children and young adults and is recognised as primarily a monophasic condition, though relapses can occur. The long-term consequences of paediatric ADEM can include significant neurological and neuropsychological impairment. With limited research and case examples in the literature, we aim to present a case series of children/adolescents post-ADEM.
Participants and Methods: We summarise a series of seven children/adolescents post-ADEM including neuropsychological assessments and outcome. All cases are those seen within two specialist paediatric neuropsychology services in acute National Health Service (NHS) hospitals in the UK.
Results: We highlight the multidimensional outcome for these children/adolescents' neuropsychological trajectories. Outcome is varied which may relate to a combination of factors such as difference in relapse rate, access to rehabilitation and educational support for children with acquired brain injury in the UK, together with varying risks such as age of onset, duration and severity of illness, length of time prior to initiation of treatment and quality of rehabilitation. Some common themes across cases include sleep difficulties, executive function, attention and speed of processing impairments.
Conclusions: We discuss the ongoing recovery and adjustment trajectory for children and adolescents post-ADEM including consideration of differential diagnosis such as childhood-onset multiple sclerosis (MS). We also highlight the implications at key transition points including issues such as plasticity, ongoing brain development, as well as the need for better availability of rehabilitation services for childhood ABI within the UK.
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Behavioral Neurology/Cerebral Lateralization - Poster Session 1 - 11.00 - 13.00		
Number	**Presenter**	**Poster Title**
52	Henrietta Howells	The left frontal aslant tract is important for written communication regardless of handedness
53	Yuko Meguro	A case presenting delusions of pregnancy after anterior communicating artery aneurysm rupture.
54	Stefano Sandrone	Myelin mapping of the corpus callosum: discrepancy between *in vivo* T1-weighted/T2-weighted MRI and post-mortem histology
55	Aleksandra Wojtowicz	The influence of right and left deviations of spatial attention on emotional picture recognition

The left frontal aslant tract is important for written communication regardless of handedness
Henrietta Howells, Stephanie Forkel, Flavio Dell'Acqua, Declan Murphy, Marco Catani
Objective: Handwriting has facilitated communication within and across generations, and impairment can severely impact academic performance. Recent meta-analyses describe segregated ventral 'central' and dorsal 'peripheral' brain networks that are important for handwriting, specialised in the left hemisphere in both right and left-handers. These networks are connected by a newly discovered frontal pathway important for verbal fluency. We set out to determine whether this tract is also important for written fluency.
Participants and Methods: We scanned thirty healthy subjects (16 female, 18 right-handed) using advanced diffusion imaging (spherical deconvolution) and performed virtual dissections of the frontal aslant tract (FAT) in each hemisphere. We assessed writing ability using a newly designed assessment for handwriting speed and graphomotor co-ordination (GMC).
Results: There was no difference between right and left-handers in writing speed or GMC with their dominant hand, nor tract-specific measurements of the FAT. There were significant positive correlations between handwriting speed and FAT volume in the left hemisphere in right handers ($r=0.6$, $p<0.005$) and left handers ($r=0.6$, $p<0.05$). There were also highly significant positive correlations between microstructural properties of the tract, and GMC ($r=0.5$, $p<0.005$). There were no significant associations between writing performance and the tract in the right hemisphere.
Conclusions: Our results show inter-individual differences in writing fluency are associated with structural differences in the left frontal aslant tract. We suggest this tract mediates communication between the central and peripheral handwriting networks.
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A case presenting delusions of pregnancy after anterior communicating artery aneurysm rupture
Yuko Meguro, Chika Oyama, Kazumi Hirayama, Minoru Matsuda, Etsuro Mori
Objective: Delusion of pregnancy (DP) is defined as the belief of being pregnant despite factual evidence of pregnancy, and is a Somatic Type of Delusional Disorder classified by the DSM-5 within Schizophrenia Spectrum and Other Psychotic Disorders. We report a patient presenting DPs associated with an amnestic syndrome after anterior communicating artery aneurysm rupture.
Case: The patient is a 55 y.o. right-handed college-educated menopaused woman. She had two children and had another experience of aborted pregnancy. The DPs developed 2 months after the onset associated with conditions resembling to a pregnancy such

as abdominal distention, nausea, and amenorrhea. She had delusional paramnesias; she believed to get a positive pregnancy test. She also presented with other types of delusional misidentification; she believed to talk to parents who died 15 yeas ago, and she believed to be in a maternity ward instead of a rehabilitation ward. Neurological examination was unremarkable except for olfactory deficits. Cranial MRIs and CTs showed lesions involving the right orbitofrontal and subcallosal regions, and the bilateral basal forebrains and fornices.
Results: There were a severe anterograde amnesia (WMS-R general MI 60) with intelligence preserved and a dense retrograde amnesia ranging for more than 20 years. The DPs lasted for 4 month. Even after she recognized that she was not pregnant, she frequently asked when and why the pregnancy was aborted. At the same time, the retrograde amnesia improved in some extent, and other delusional misidentifications subsided.
Conclusion: The DP in this patient can be classified into delusional misidentification syndrome.
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Myelin mapping of the corpus callosum: discrepancy between *in vivo* T1-weighted/T2-weighted MRI and *post-mortem* histology
Stefano Sandrone, Michel Thiebaut de Schotten, Katja Reimann, Claire Troakes, Istvan Bodi, Luis Lacerda, Declan Murphy, Stefan Geyer, Marco Catani, Flavio Dell'Acqua
Objective: The corpus callosum is the largest white matter tract of the human brain and is crucial for parallel processing and integration underlying cognitive functions and behaviour. Here we use *in vivo* and *post-mortem* myelin mapping to demonstrate a gradient of myelin density for different callosal regions. These anatomical differences may have important implications to understand the development of cognitive functions and associated disorders.
Participants and Methods: Two analyses were performed. For the *in vivo* analysis, T1w/T2w datasets from Human Connectome Project-Q3 release (57 healthy subjects, aged 21-35) and HCP-Lifespan (10 healthy subjects, age 45-75) were used. For the *post-mortem* analysis, four callosal human samples (aged 12, 68, 73 and 82) were manually dissected and sectioned along the mid-sagittal plane, stained for Luxol Fast Blue and analysed for myelin density. Normalised myelin maps were created for both datasets and compared.
Results: We report a discrepancy between *in vivo* and *post-mortem*> myelin maps. *In vivo* myelin maps showed high values in the anterior part (rostrum/genu), low values in the isthmus and mixed values in the posterior part (splenium). Histological quantification showed a low myelin density anteriorly, high density in the isthmus and mixed values posteriorly. The discrepancy between T1w/T2w and histology was consistent across the subjects and independent from age.
Conclusions: T1w/T2w mapping and histology may map different aspects of microstructural properties of fibres. Future studies are needed to understand how these properties correlate with behavioural patterns and the lateralisation of cognitive functions.
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The Influence of Right and Left Deviations of Spatial Attention on Emotional Picture Recognition
Aleksandra Wojtowicz, Michal Harciarek, John Williamson, Kenneth M. Heilman
Objective: The right hemisphere appears to be dominant for orienting spatial attention and the visual perception of emotional scenes. Additionally, some studies have found that, whereas positive emotions are mediated by the left hemisphere, negative emotions are mediated by the right hemisphere. However, the relationship(s) between the hemispheric brain systems subserving spatial attention and emotional recognition have not been fully examined. This study aimed at investigating how manipulating the orientation of spatial attention to the right or left affects the visual perception of emotions.
Methods: Participants were 42 healthy, right-handed young adults. To induce a directional change in spatial attention, a horizontal prism adaptation method was used (leftward vs. rightward vs. control). After each prism adaptation, participants evaluated a set of affective (positive/neutral/negative) pictures from the Nencki Affective Picture System. Correct responses in each emotional category and reaction times were analyzed.
Results: Whereas there were no effects of prism adaptation on reaction times, when compared to the control condition, both rightward and leftward prism adaptation resulted in a reduction of correctly recognized positive emotions. Also, rightward prism adaptation made neutral pictures being perceived as more emotional as well as led to a decrement in the recognition of negative emotions.
Conclusions: The activation of the right hemisphere following rightward prism adaptation could account for both the increase in emotionality of neutral pictures and decrease in recognition of positive emotions. However, future studies are needed to understand why this type of prism adaptation may also impair the recognition of negative emotions.
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Poster Session 2: Wednesday 6th July 2016 - 14.30 - 17.00

Dementia (Alzheimer's Disease) - Poster Session 2 - 14.30 - 17.00		
Number	**Presenter**	**Poster Title**
1	Sarah Banks	Relationship between CSF biomarkers, hippocampal volumes and performance on neuropsychological tests
2	Eva Bolcekova	RBANS cognitive profiles of patients with different neurodegenerative diseases
3	Juhee Chin	The characteristics of sleep problems in patients with subjective memory impairment, amnestic mild cognitive impairment and Alzheimer's disease
4	Israel Contador	Influence of education on cognitive decline in older adults with dementia: A longitudinal population-based study (NEDICES)
5	Mireia Hernández	Does the greater efficiency of executive control of bilinguals act as a compensatory mechanism against cognitive decline?
6	Emi Ito	Efficient use of verbal fluency tests to detect dementia in terms of sensitivity and specificity
7	Andrew Kirk	Declining use of anticholinergic medications over eleven years in patients referred to a rural and remote memory clinic
8	Sylvie Martins	Self-defining memories in Alzheimer's disease and normal aging
9	Anthony Martyr	Awareness of functional ability in people with early-stage dementia
10	Nidhi Dev	The Fifteen minute Assessment of Cognition over the Telephone (FACT): A telephone interview to detect and monitor cognitive deficits in dementia
11	Hanne Rollinger	Transformation formulae between the Mini Mental Status Examination (MMSE) and the Montreal Cognitive Assessment (MoCA) and screening properties of the MoCA
12	Sushmita Sircar	Distinguishing Alzheimer's disease from vascular dementia by examining pattern of executive function errors
13	Julie Suhr	Does subjective cognitive decline accurately reflect cognitive functioning?
14	Lynette Tippett	Self-continuity and narrative identity in mild cognitive impairment and early Alzheimer's disease
15	Clara Vila-Castelar	Early predictors of response to donepezil in Alzheimer's disease: sensitive attention measures of accuracy and variability predict future neuropsychiatric function

Relationship between CSF biomarkers, hippocampal volumes and performance on neuropsychological tests
Sarah Banks, Justin Miller, Nanako Hawley, Jody-Lynn Berg, January Durant, Gabriel Leger
Objectives: CSF assays of beta amyloid 42, tau, and the ratio between these values (ATI) are frequently used biomarkers of

Alzheimer's disease. Neuropsychological tests have been shown to be sensitive to even very early changes in Alzheimer's Here we assess the relationship between CSF measures with neuropsychological tests and hippocampal volume in atypical dementia patients.
Methods: 42 patients were tested as part of their standard diagnostic work up for questions of neurodegenerative disease. CSF was measured by the same Athena lab in each case. Hippocampal volumes were assessed with Neuroquant as part of their clinical evaluation. The neuropsychological battery consisted of tests of verbal and nonverbal memory as well as tests in all other cognitive domains. Pearson's correlation coefficients were calculated.
Results: Nonverbal memory correlated positively with amyloid and ATI. Tau (both p–tau and t-tau) levels, however, were negatively correlated only with tests of naming and switching. The ATI was positively correlated with tests of verbal and nonverbal memory, and switching. None of the CSF measures correlated with hippocampal volumes.
Conclusions: Our results indicate a split between cognitive domains and relationships with different CSF biomarkers. In Alzheimer's disease, amyloid changes early in the disease process, and in our study was related to aspects of memory. Tau deposits later in the process, and in the current study was related to executive and language measures.
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RBANS cognitive profiles of patients with different neurodegenerative diseases
Eva Bolcekova, Katerina Cechova, Silvie Johanidesova, Robert Rusina
Objective: RBANS is a relatively short neuropsychological battery, that can be effectively used in everyday practice to identify cognitive deficits in ageing population. Aim of this work is to present cognitive profiles of different neurodegenerative diseases in this method.
Participants and Methods: We evaluated 359 neuropsychological exmaniations of patients presenting at neurology clinic, mostly with memory complaints. Mean age was 74.3 years (SD 9.6), mean education 13.7 years (SD 3.3). Patients underwent neurological examination, CT or MR and other diagnostic methods which allowed to diagnose them according to current criteria. The sample includes patients with Alzheimer's disease, mild cognitive impairment, frontotemporal lobar degeneration, Lewy body disease, vascular cognitive impairment and depression. RBANS standard scores were transformed to z-scores and compared between diagnostic groups.
Results: All RBANS measures significantly differed among our diagnostic groups, and we describe their cognitive profiles. In Alzheimer's disease patients, Immediate and Delayed Memory are the most impaired, whereas in Lewy body disease, the lowest score is Visuospatial/Constructional. Patients with depressive disorder score lowest on Attention scale. We show sensitivity and specificity of RBANS in differential diagnosis of dementia.
Conclusions: RBANS helps differentiate between different diagnostic groups of dementia, based on their cognitive profiles.
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The Characteristics of Sleep Problems in the Patients with Subjective Memory Impairment, Amnestic Mild Cognitive Impairment and Alzheimer's Disease
Juhee Chin, Eun Yoen Joo, Su Jung Choi, Sang Won Seo, Duk L. Na
Objective: The relationship between sleep disturbance and cognitive impairment is well established. The aim of this study is to investigate the relationship between severity of cognitive impairment and sleep problems by comparing the characteristics of sleep disturbance among the patients with subjective memory impairment (SMI), amnestic mild cognitive impairment (MCI) and Alzheimer's disease (AD).
Participants and Methods: In a memory disorder clinic, total 1088 patients were recruited (224 with SMI, 506 with amnestic MCI, and 358 with AD). The sleep symptoms were measured by the 7 items of "sleep and nighttime behavior disorders" subscale in the Neuropsychiatric Inventory, which were rated by caregivers. In each item, the frequency of the symptom was compared among three groups.
Results: There was no significant difference among three groups in the presence of overall sleep problems. However, the specific characteristics of sleep symptoms were significantly different. In SMI group, only "difficulty falling asleep" and "frequent awaking after sleep onset" were reported. "Daytime excessive sleep" was added to the sleep problems in the amnestic MCI patients. In the AD patients, "wondering at night", "waking caregiver from their sleep" and "waking up at night and thinking it's morning" were exclusively reported, and "daytime excessive sleep" was more severely reported than in MCI group.
Conclusions: The different characteristics of sleep problems in cognitive disorders should be carefully evaluated in the clinical setting, because it might represent the underlying pathological neuronal changes.
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Influence of education on cognitive decline in older adults with dementia: A longitudinal population-based study (NEDICES)
Israel Contador, Felix Bermejo-Pareja, Sara Llamas, David Lora, Bernardino Fernandez-Calvo, Elina Boycheva, Alberto Villarejo, Julian Benito-Leon
Objective: We investigate whether educational attainment influences the cognitive trajectories of older adults with dementia.
Participants and methods: People with dementia were selected from NEDICES, a prospective population-based cohort study of older adults (65 years and over) in central Spain. The diagnosis of dementia was made in two phases: screening and diagnosis by specialists (DSM-IV criteria). At baseline (1994-1995) and follow-up (1997-1998), a 37-item version of the Mini-Mental State Examination (MMSE-37) was used to assess the rate of decline. Individuals were classified as low (illiteracy or can read and write) versus high educational level (at least certificate of primary school).
Results: Of the 306 patients with diagnosis of dementia in the first cohort (1994-1995), only 53 (35 with Alzheimer's disease and 18 with other types of dementia) completed the MMSE-37 assessments at Times 1 and 2 (mean follow-up = 2.8 ± 0.5 years). The two groups (10 with high education vs. 43 with low) were matched on sociodemographic and clinical characteristics. At the 3-year follow-up, the MMSE-37 decreased by 3.34 ± 4.98 points in low-educated individuals with dementia versus 7.90 ± 4.88 points in highly-educated people (effect size (r) = 0.32, p = 0.02).
Conclusion: Low education influenced the cognitive trajectories of patients with dementia assessed by the MMSE-37.
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Does the greater efficiency of executive control of bilinguals act as a compensatory mechanism against cognitive decline?
Mireia Hernández, Marco Calabria, Gabriele Cattaneo, Anna Suades, Montserrat Juncadella, Ramón Reñé, Isabel Sala, Alberto Lleó, Jordi Ortiz-Gil, Lidia Ugas, César Ávila, Albert Costa
Objective: There is growing evidence that bilingualism acts as a cognitive reserve mechanism in older adults and age-related disorders such as dementia. However, there is no clear agreement about the underlying mechanisms of it. The aim of this study is to investigate of such bilingual advantage by using a range of tasks of executive control, attention and episodic memory in early and late bilinguals.
Participants and Methods: 40 bilinguals with Alzheimer's disease and 40 age-matched older bilinguals were tested. Half of participants of each group were early and high proficient in Catalan and Spanish and half were Spanish speakers with late acquisition of Catalan as a second language. All participants were tested in several tasks: ANT, spatial stroop, task switching, recognition memory, picture naming and language switching.
Results: Distributional analyses (ex-Gaussian) were used to analyze the data. Preliminary results showed that early and high proficient bilingual AD patients outperformed late bilinguals in EC tasks. Interestingly, group differences were found for those components of the ex-Gaussian distribution that have been related to more demanding processes of EC. Moreover, the advantage survived after having controlled for other cognitive reserve factors and the level of education.
Conclusions: First, these preliminary data add new evidence that bilingualism acts a cognitive reserve mechanism. Second, it seems

that the age of acquisition of second language has a crucial role in determining such bilingual advantage. Finally, such advantage should be driven by 'compensatory' mechanisms from the EC system in protecting against cognitive decline.
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Efficient use of verbal fluency tests to detect Dementia in terms of sensitivity and specificity
Emi Ito, Takeshi Hatta, Naoki Nishijima, Akihiko Iwahara, Chie Hotta, Naoko Nagahara, Yuki Sakane
Objective: To explore the efficient use of verbal fluency tests to distinguish subjects with dementia from healthy older ones.
Participants and Method: Two hundred-eighty-two healthy subjects aged over 60 participated in the study with informed consent. Three kinds of letter fluency tests (A, Ka, Shi), category fluency tests (Animal, Occupation, Sports) were administrated for 60 seconds each (Ito E et al., 2004, 2006) and MMSE (Folstein et al., 1975） was conducted. Results of letter and category fluency tests and the score of MMSE in 35 clinical subject diagnosed dementia were collected from medical charts after approval of ethical committee in the hospital. Discriminant analyses were applied to examine the level of contribution of every task and the sensitivity and specificity to ddistinguish between healthy and dementia.
Results: Using the number of the words and errors in every letter and category fluency tasks, 92.7% of original cases were correctly classified with 82.9% in sensitivity and 93.9% in specificity (Wilks' Lambda; .579, χ^2=167.254, p<.001, canonical correlation;.649). In addition, the number of the words and errors in 'sports' task and the number of errors in 'shi' task were influential variables to detect dementia. Using the number of words and errors in these two tasks, 89.8% of original cases were rightly classified with 82.9% in sensitivity and 90.7% in specificity (Wilks' Lambda;.657, χ^2=130.424, p<.001, canonical correlation; .586).
Conclusions: For detecting dementia, it is permissible to administrate only two verbal fluency tasks with considerable level of sensitivity and specificity as the first screening test.
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Declining use of anticholinergic medications over eleven years in patients referred to a rural and remote memory clinic
Andrew Kirk, Ryan Verity, Debra Morgan, Chandima Karunanayake
Objectives: Anticholinergic and sedating medications are generally contraindicated in those with cognitive decline. We examined trends in medication use by patients presenting to a rural and remote memory clinic (RRMC) between March 2004 and June 2015 to determine whether patterns of medication use have changed.
Participants and Methods: The first 445 patients seen at the RRMC between 2004 and 2015 were included in this analysis. Medication lists were collected at the patient's initial visit, and it was noted whether patients were taking anticholinergic drugs. Statistical analysis (Spearman's Correlation) was conducted to examine trends in medication use over time.
Results: Ninety-one patients (20.5%) were taking at least one anticholinergic medication. There was a statistically significant decline (25.0% in 2004 to 12.5% in 2014) in percentage of patients presenting with anticholinergic medications over the eleven years of this study (Spearman's correlation coefficient = -0.64, p=0.035).
Conclusions: The most encouraging statistic to come from this study is a decline in anticholinergic medication use in this rural population. Prescribers must be properly informed to ensure that the number of medications per patient does not continue to rise, that medications are used only as necessary, and that potentially deleterious medications are avoided.
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Self Defining Memories in Alzheimer's Disease and Normal Aging
Virginie Voltzenlogel, Sylvie Martins, Christine Cuervo-Lombard
Objective: Autobiographical memory deficits have been well documented in patients with Alzheimer's disease (AD). Our aim was to investigate whether the characteristics of self defining memories (SDM), i.e. vivid memories of highly significant life events, that helps explain who one is as an individual, of AD patients differ from that of healthy elderly controls.
Participants and Methods: Thirty patients presenting a clinical diagnosis of probable AD (mean MMSE =22.5) and 30 healthy elderly controls (mean MMSE = 28,0) matched for gender, age, education level, housing situation, marital status and anxiety / depression levels were included. Participants were asked to recall three SDM, to rate their emotional response while remembering the event and to date it. Each SDM was scored for specificity, content, meaning making (i.e. the ability to learn lessons about past events), redemption / contamination and tension.
Results: Patients with AD recalled less specific and less integrated SDM than healthy elderly controls. Content of SDM differed between the two groups, but no difference was observed in emotion, redemption/ contamination and tension. We observed a reminiscence bump in AD patients, but no recency effect.
Conclusions: Autobiographical memories highly related to the self, which play an important role in grounding and maintaining the sense of identity, were altered by AD. We confirm the impairment in terms of episodicity demonstrated previously. We also highlight that the ability to extract meaning from SDM, a marker of functional and dynamic self memory system, is altered in AD patients.
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Awareness of functional ability in people with early-stage dementia
Anthony Martyr, Linda Clare
Objective: For people with suspected dementia, assessment of functional ability forms part of the diagnostic process and may help stage severity. Clinicians and researchers frequently rely on informant ratings of functional ability but there has been little research to verify the reliability of these. The current study investigated the accuracy of ratings made by people with dementia (PwD) and informants by comparing ratings with objective performance.
Participants and Methods: Thirty-seven people with early-stage Alzheimer's disease, vascular dementia, or mixed Alzheimer's disease and vascular dementia (mean age 79.22, mean MMSE 22.92; range 18-28) completed a functional assessment. The study incorporated a novel meta-cognition approach with PwD providing self-ratings of expected or actual performance before and after objective assessments of functional ability. Informants provided corresponding ratings of functioning.
Results: Raw scores for objective assessments were converted to percentages to facilitate comparison with ratings. Self-ratings made before test (mean 65%) and the self-ratings made after test (mean 65%) did not differ significantly from the functional assessment score (mean 66%), suggesting that PwD were able to accurately appraise their own functional ability, whereas informant ratings (mean 48%) significantly underestimated the functional ability of PwD.
Conclusions: Self-ratings of functional ability made by PwD accurately reflect objective test scores, whereas informant ratings significantly underestimate functional ability. This finding suggests that self-ratings by PwD may offer a more accurate estimate of functional ability than informant ratings and calls into question the value of using informant ratings alone to assess the everyday functioning of PwD.
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The Fifteen minute Assessment of Cognition over the Telephone (FACT): A telephone interview to detect and monitor cognitive deficits in dementia
Jwala Narayanan, Siddharth Ramanan, Nidhi Dev, Ratnavalli Ellajosyula
Objective: To widen our range of detecting dementia in those who cannot visit hospitals, a brief telephone-screen was designed and piloted for its ability to differentiate and monitor patients with Mild Cognitive Impairment (MCI) and Alzheimer's disease (AD).
Participants and Methods: The FACT consists of 27 items categorized under attention and orientation, memory, language, and executive functions domains. Healthy volunteers (n=20) matched for age and education to patients with MCI (n=14) and AD (n=15) were administered the FACT a week after presentation and neuropsychological testing at the clinic. Performance on the

Addenbrookes Cognitive Examination (ACE III) was used to correlate test performance on the FACT.
Results: The Pearson correlation coefficient between the FACT and the ACE III was 0.82 (p = 0.00). Correlations on the sub components of the FACT and the counterpart domains of the ACE III indicated moderated to high correlations. The area under the ROC curve for FACT discriminating MCI from AD was 0.92 and MCI from healthy volunteers was 0.83.
Conclusion: The FACT proved to be a comparable and effective tool to the ACE III in detecting MCI and monitoring progression to AD. It successfully differentiates patients with MCI from AD, which has clinical and research implications for early intervention and better monitoring of cognitive decline.
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Transformation formulae between the Mini Mental Status Examination (MMSE) and the Montreal Cognitive Assessment (MoCA) and screening properties of the MoCA
Hanne K. Rollinger, Manfred Berres, Michael M. Ehrensperger, Andreas U. Monsch
Objective: According to literature, compared to the MMSE, the MoCA has superior diagnostic utility for highly educated subjects and patients with mild cognitive impairment (MCI). This study aimed (1) to generate transformation formulae between the MMSE and MoCA and (2) to establish the optimal cut-off score for the German MoCA.
Participants and Methods: 24 cognitively healthy individuals (11 men, 13 women; age = 75.4 ±6.7, education = 14.1 ±3.5; MMSE mean = 28.7 ±1.4; MoCA mean = 26.9 ±2.8) and 25 patients with MCI or early dementia of different etiologies (inclusion criterion: MMSE ≥ 20/30 points; 11 men, 14 women; age = 75.2 ±7.3, education = 12.2 ±3.4; MMSE mean = 25.6 ±2.8; MoCA mean = 20.9 ±4.3) were administered the MMSE and the MoCA.
Results: The Pearson correlation coefficient between the two scores was r = .79, p <.001. The reduced major axis (RMA) was determined to calculate the slope and intercept of a regression line. The following translation formulae emerged: MoCA = -23.64 + 1.750 × MMSE, and MMSE = 13.51 + 0.571 × MoCA. Receiver Operating Characteristic curves resulted in an optimal cut-off for the MMSE of 26/27 (sensitivity = 60%, specificity = 96%; AUC=0.834) and for the MoCA of 24/25 (sensitivity=80%, specificity=88%; AUC=0.863).
Conclusion: MMSE and MoCA revealed a positive linear relationship. As expected, the MoCA was superior to the MMSE in subjects with rather subtle cognitive deficits. In contrast to Nasreddine et al. (2005), the optimal cut-off score for the MoCA was found to be 24/25 in our preliminary study.
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Distinguishing Alzheimer's Disease from Vascular Dementia by examining pattern of executive function errors
Sushmita Sircar, Tanvi Dingankar, Sulakshana Rao, Erica Sugita, Amitabha Ghosh, Aparna Dutt, Narinder Kapur
Objective: Both patients with Alzheimer's Disease (AD) and those with Vascular Dementia (VAD) may perform badly on executive function tests, but so far there appears to have been little attempt to see whether a qualitative analysis of pattern of error on executive function tests will help to distinguish these two forms of dementia.
Participants and Method: We administered the Brixton Spatial Anticipation Test to 100 patients diagnosed with Alzheimer's Disease and 100 patients with Vascular Dementia. Patients were matched for education, MMSE and total error score on the Brixton test. We examined the pattern of performance errors between the two groups.
Results and Conclusion: While the VAD group made significantly more perseverative errors and more random errors compared to the AD group of patients, the AD group made more stimulus-bound errors than the VAD group. Our findings are in concordance with other studies that have pointed to more severe executive dysfunction in VAD compared to AD, and to studies that have found stimulus-bound errors in the cognitive functioning of AD patients. We further sub-divided our AD group into Late Onset (EOAD) and Early Onset (LOAD) Alzheimer's Disease (n=54, n=46 respectively) to compare their pattern of performance on the Brixton test. While the EOAD group made significantly more random and perseverative errors compared to the LOAD group of patients, the LOAD group committed more stimulus-bound errors. Our findings point to distinct executive dysfunction profiles in various forms of dementia. The success of our approach also illustrates the value of analyzing qualitative aspects of neuropsychological test performance.
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Does Subjective Cognitive Decline Accurately Reflect Cognitive Functioning?
Julie Suhr, Anna Kinzer, Elana Gloger
Objective: Research suggests subjective cognitive decline (SCD; usually measured by yes/no question) accurately detects early dementia. Other research suggests SCD is related to psychological factors and doesn't predict cognitive decline. Another factor potentially related to SCD is dementia worry. Our purpose was to examine the relationship of SCD to these constructs.
Participants and Methods: Participants were nondemented older adults (age 62-87, mean 71, 62% female) who participated in a dementia screening. Participants completed clinical interview, measures of depression, general worry, stress, dementia worry, subjective cognitive complaints, and various memory tests, as part of a larger battery.
Results: The sample was divided into those who reported memory decline in the past year and those who had not, based on response to a binary item. Groups did not differ in demographics, actual memory impairment, depression, general worry, or stress, but the SCD group reported more dementia worry and subjective cognitive complaints. In the SCD group, higher dementia worry correlated with more depression, general worry, and stress, but was unrelated to subjective cognitive complaints and actual memory performance. In the no SCD group, higher dementia worry was unrelated to psychological factors, but was associated with higher subjective cognitive complaints and more impaired memory scores. In the SCD group, higher subjective cognitive complaints were not associated with actual memory, but in the no SCD group, higher subjective complaints were associated with more impaired memory scores.
Conclusions: Results suggest SCD does not accurately indicate cognitive impairment, but is confounded by depression, worry, stress, and dementia worry.
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Self-Continuity and Narrative Identity in Mild Cognitive Impairment and early Alzheimer's Disease
Lynette Tippett, Donna Rose Addis, Sally Prebble
Objective: "Self-continuity" is the belief that, despite changes across the lifespan, one continues to be the same person. Autobiographical memory may contribute to self-continuity, although the mechanisms are unclear. We explore whether self-continuity is maintained by interpreting our lives through life-stories, in older adults with episodic memory impairments.
Participants and Methods: Healthy older adults (HC, N=25), individuals with amnestic mild cognitive impairment (aMCI, N=15) or early Alzheimer's disease (AD, N=15). Self-continuity interview: Assessed beliefs about whether they were the same person as in their 20s, how they have changed/remained the same, and reasons why they consider themselves the same person. Life story interview: Integrity of narrative processes was assessed by measuring autobiographical reasoning (self-event connections), and coherence (temporal/thematic/causal) of life-stories.
Results: Groups did not differ in perceived self-continuity or core continuity; AD participants expressed higher continuity of traits/characteristics. However, AD participants provided the least sophisticated explanations for self-continuity, using superficial characteristics of stability without integrating change. AD life-stories contained a lower proportion of self-event connections than HCs, and had lower temporal and thematic coherence (vs. HC, aMCI). Both AD and aMCI groups had lower causal coherence.
Conclusions: Individuals with memory impairments have strong preserved beliefs about self-continuity, even when their explanations are simplistic. Life stories of AD participants contained fewer links between events and self-concept, and conveyed thematic, temporal and causal links between elements less well. This suggests the ability to weave high-quality life narratives may scaffold the capacity to understand and explain one's continuity across time.
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Early predictors of response to donepezil in Alzheimer's Disease: sensitive attention measures of accuracy and variability predict future neuropsychiatric function.
Clara Vila-Castelar, Avinash Chandra, Lillian Kaplan, Jenny J. Ly, Kathleen Van Dyk, Jeffrey T. Berger, Lucy O. Macina, Jennifer L. Stewart, Nancy S. Foldi
Objective: Neuropsychiatric symptoms in patients with Alzheimer's disease (AD) are linked to poorer global cognitive and functional outcomes. We previously demonstrated that high-load attentional measures were sensitive to cholinesterase inhibitor response at 6 weeks, predicting cognitive response at 6 months. We now propose that attention can also predict non-cognitive improvement. We hypothesized that higher performance on high-load attention tasks after 6 weeks would predict better neuropsychiatric functioning after 6 months.
Participants and Methods: Twenty-two participants newly diagnosed with AD were administered daily donepezil (5mg) and evaluated at baseline (T1), after approximately 6 weeks (T2) and 6 months (T3). The Neuropsychiatric Inventory (NPI) assessed frequency and severity of behavioral and psychiatric disturbances. The Attentional Blink assessed top-down accuracy, identifying an alphanumeric character after an a priori category cue at increasing load (stimulus onset asynchrony, SOA=133–665ms). Target Detection assessed response variability using standard deviation of reaction time to targets presented at increasing load (SOA=350–1400ms). Multiple linear regressions identified significant attention predictors of T3 NPI scores, which were then introduced into a model.
Results: At T2, blink accuracy at 266ms (β= -24.18, *p*=.04) and variability at 350ms (β=.18, *p*=.02) predicted T3 NPI scores. The regression of the overall model accounted for 31% of NPI variability (*p* = .03). **Conclusions:** Higher accuracy and reduced variability of attentional tasks at high-load predicted better psychiatric prognosis at 6-months. This suggests that early high-load attentional measures are sensitive to future behavioral symptom changes in AD, representing a potential early measure of treatment response.
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Dementia (non-Alzheimer's Disease)/Small vessel disease - Poster Session 2 - 14.30 - 17.00		
Number	**Presenter**	**Poster Title**
16	Alba Gavaldà	Robot syndrome: A case of severe emotional aprosody as the onset of frontotemporal dementia
17	Atsuko Hayashi	A Japanese patient with primary progressive aphasia (PPA) characterized by logopenic progressive aphasia (LPA) and semantic dementia (SD): A 3-year follow-up study
18	Hanna Jokinen	Cognitive reserve as a predictor and moderator of long-term cognitive and functional outcome in cerebral small vessel disease
19	Linda Jütten	Do informal caregivers of people with dementia mirror the cognitive deficits of their demented patients? - a pilot study
20	Valerie Lohner	Apathy, but not depression, is associated with executive dysfunction in cerebral small vessel disease
21	Catherine Merck	Does the left posterior fusiform gyrus play a critical role in fruit and vegetables categorization? Evidence from 19 semantic dementia patients
22	Otto Pedraza	Visuoperception in dementia with Lewy bodies
23	Masahito Takagi	Epilepsy complicates verbal function of primary progressive aphasia

Robot syndrome: A case of severe emotional aprosody as the onset of frontotemporal dementia
Alba Gavaldà, Marta Rubio, Gisela Ribera, Venessa González, Merce Jódar
Objective: The cognitive profile of frontotemporal dementia is characterized by changes that affect behavior, personality, and cognition. Focal variants typically affect the left hemisphere, and begin with primary progressive aphasia (nonfluent, fluent, or logopenic). Fronto-temporal dementia with the first symptoms focused on the right hemisphere is a very unusual disease, and little is known about the neuropsychological deficits associated with this atypical onset.
We report a case of frontotemporal dementia with right hemisphere focus that begins with slow progressive aprosody and a gradual alteration in emotional recognition.
Method: A 71-year-old woman with a 1.5 year history of strange speech (metallic voice) and difficulty singing were assessed. She follows an insidious onset and a progressive course, with progressive aprosody and a gradual difficulty in emotional recognition. Neurological, otolaryngological (ENT), neuropsychological and neuroimaging study (MRI) were carry out. The neuropsychological assessment includes a test to evaluate prosody.
Results: The neurological examination showed aprosody characterized with a robotic and metallic voice, accompanied with hypomimia. The MRI study revealed no abnormalities. ENT results were normal. The neuropsychological examination revealed severe aprosody that was properly fluent and without aphasic signs. In addition it showed amusia, slight deficits in executive function, and alterations in emotional recognition and emotional interpretation of language. All other cogitive functions assessed were preserved.
Conclusions: Progressive aprosody and gradual decline of emotional recognition is a rare beginning form of frontotemporal dementia.
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A Japanese patient with primary progressive aphasia (PPA) characterized by logopenic progressive aphasia (LPA) and semantic dementia (SD): A 3-year follow-up study
Atsuko Hayashi, Kazuo Sakai, Kenichi Matsuyama, Yasuji Yamamoto
Objective: Here we report a patient with PPA who initially showed sentence repetition and naming disorders, gradually developed mild semantic memory impairment and phonologically plausible agraphia, and presented severe naming disorders.
Participants and Methods: A 70-year old, right-handed woman with 12 years of education complained of speech difficulties three years ago. She showed word-finding difficulty and slight phonological anomia without anarthria and agrammatism. On brain MRIs, left anterior temporal lobe atrophy had noted for three years. Regional cerebral blood flow measurement with single photon emission computed tomography showed hypoperfusion in the left temporal cortex. Two years after onset, the area of hypoperfusion spread to the left temporal, parietal, and occipital cortices. Following neuropsychological tests were repeated at the interval of one year.
Results: MMSE; 29 or 30 for three years, Alzheimer's Disease Assessment Scale (X: onset, X+1: one year later, X+2: 2 years later, X+3: 3 years later); 3, 2.7, 6.3, 6.7, Western Aphasia Battery (X, X+2, X+3) AQ; 83.4, 84.2, 81.6, Repetition; 7.4, 7.6, 7.6, Naming; 8.7, 8.6, 7.7, Writing; 9.1, 8.7, 8.3, Wechsler Memory Scale-Revised (X+2, X+3); Verbal Memory; 80, 71, Visual Memory; 108, 121, Attention/Concentration; 103, 90, Token Test(X+2, X+3); 148/167, 142/167.
Conclusions: Diagnoses of LPA and SD could be made according to the radiological findings. The sentence repetition and naming disorders were characterized by LPA. With disease progression, mild semantic memory deficits, severe naming deterioration, and phonologically plausible agraphia should have been shown as an atypical type of SD.
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Cognitive reserve as a predictor and moderator of long-term cognitive and functional outcome in cerebral small vessel disease

Hanna Jokinen, Susanna Melkas, Sofia Madureira, Ana Verdelho, Jose M. Ferro, Franz Fazekas, Reinhold Schmidt, Philip Scheltens, Frederik Barkhof, Joanna M. Wardlaw, Domenico Inzitari, Leonardo Pantoni, Timo Erkinjuntti

Objective: Cerebral small vessel disease is characterized by progressive white matter hyperintensities (WMH), cognitive decline and loss of functional independence. The correspondence between neuroimaging findings and the severity of clinical symptoms has been modest, however, and thus the outcome may be affected by various host factors. We investigated the predictive value of educational and occupational attainments as proxy measures of cognitive reserve on long-term cognitive and functional outcome in subjects with different degrees of small vessel disease.

Participants and Methods: In the Leukoraraiosis and Disability Study (LADIS), 615 older individuals with mild to severe WMH were evaluated with brain MRI and detailed neuropsychological assessments in 3-year follow-up. A prolonged follow-up of cognitive and functional status was administered with a structured telephone interview after up to 7 years.

Results: Higher levels of education and occupational attainment were strongly related to baseline cognitive scores and predicted slower rate of decline in 3-year follow-up in measures of processing speed, executive functions and memory regardless of WMH volume. The deleterious effect of WMH on processing speed and memory was moderated by education and occupation. Education mitigated the relation of WMH volume on 7-year cognitive status. Moreover, higher levels of education and occupational attainments were related to favorable outcome in 7-year follow-up as defined by sustained functional independence and survival.

Conclusion: The results support the presumption that cognitive reserve plays a significant role as a buffer against the clinical manifestations of small vessel disease and may explain high individual variability in outcome.

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Do informal caregivers of people with dementia mirror the cognitive deficits of their demented patients? - a pilot study

Linda Jütten, Ruth Mark, Margriet Sitskoorn

Recent research suggests that informal caregivers of people with dementia (ICs) experience more cognitive deficits than non-caregivers. The reason for this is not yet clear.

Objective: to test the hypothesis that ICs 'mirror' the cognitive deficits of the demented people they care for. **Participants and methods:** 105 adult ICs were asked to complete three neuropsychological tests: letter fluency, category fluency, and the logical memory test from the WMS-III. The ICs were grouped according to the diagnosis of their demented patients. One-sample t-tests were conducted to investigate if the standardized mean scores (t-scores) of the ICs were different from normative data. A Bonferroni correction was used to correct for multiple comparisons.

Results: 82 ICs cared for people with Alzheimer's dementia and 23 ICs cared for people with vascular dementia. Mean letter fluency score of the ICs of people with Alzheimer's dementia was significantly lower than the normative mean letter fluency score, p = .002. The other tests yielded no significant results.

Conclusion: our data shows that ICs of Alzheimer patients have cognitive deficits on the letter fluency test. This test primarily measures executive functioning and it has been found to be sensitive to mild cognitive impairment in recent research. Our data tentatively suggests that ICs who care for Alzheimer patients also show signs of cognitive impairment but that it is too early to tell if this is cause for concern or not.

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Apathy, but not depression, is associated with executive dysfunction in cerebral small vessel disease

Valerie Lohner, Matthew Hollocks, Rebecca Brookes, Robin Morris, Hugh Markus

Objective: Neuropsychiatric comorbidities are particularly prevalent amongst those with Cerebral Small Vessel Disease (SVD), with symptoms of apathy and depression being most commonly reported. It has yet to be determined how closely these symptoms are related to the presence of cognitive impairment.

Participants and methods: 196 patients were included, aged between 40 and 87 years and with a symptomatic lacunar stroke with an anatomically corresponding lacunar infarct in brain imaging. Apathy and depression were measured by the Geriatric Depression Scale. Cognitive functioning was assessed by use of the Brief Memory and Executive Test, including both an orientation/memory and executive functioning/processing speed subscale. Path analysis and binary logistic regression were used to assess the relation between apathy, depression and cognitive impairment.

Results: Mean age of all participants was 63.5 years (SD=9.91), 67.9% was male. 31 participants (15.8%) met the criteria for apathy, 23 participants (11.8%) for both apathy and depression, and 2 participants (1.0%) for depression only. The magnitude of apathy was negatively related to both executive functioning/processing speed (β=-.351, p=.000) and memory/orientation (β=-.317, p=.000), whereas the magnitude of depression is not. The presence of apathy is related to impaired executive functioning/processing (OR=2.377, p=.042) speed but not to impaired memory/orientation (OR=1.505, p=.394).

Conclusions: Apathy is a core symptom of SVD. Apathy, but not depression, is associated with impaired executive functioning/processing speed. These findings suggest that apathy is an important clinical symptom in SVD and that specific screening for apathy in addition to depressive symptoms may aid patient management.

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Does the left posterior fusiform gyrus play a critical role in fruit and vegetables categorization? Evidence from 19 semantic dementia patients

Catherine Merck, Isabelle Corouge, Pierre-Yves Jonin, Béatrice Desgranges, Jean-Yves Gauvrit, Serge Belliard

Objective: We previously showed a relative preservation of sorting performance for fruit and vegetables (FV) in semantic dementia (SD) patients. In the present study, we aimed at understanding what might be the neural substrate of that unusual category effect in SD.

Participants and Methods: Nineteen SD patients performed a semantic sorting task and underwent a morphometric 3T MRI scan. The volumes of 5 regions of interest (ROIs) within the temporal lobe, bilaterally delineated from the AAL template, were computed as well as of two recently described areas within the posterior fusiform gyrus (FG1 and FG2).

Results: We found a main effect of category with better performance on FV compared with tools and kitchenware. FV score was linked to the left FG1 volume alone. None of the other categories-scores was correlated to this area. Moreover, FV-score was not associated with any other ROI volume.

Conclusions: We reported a specific relationship between the volume of a subregion within the left posterior fusiform gyrus and FV sorting performance in SD. This area was proved to be a core region underlying FV identification. Since prior studies emphasized the major role of color knowledge in the identification of FV, the left FG1 and its strategic position, near the lingual gyrus, could be a privileged candidate for the storage of the color knowledge of objects

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Visuoperception in dementia with Lewy bodies

Adam Parks, Otto Pedraza

Objective: Oculomotor anomalies, visual hallucinations, and visuoperceptual deficits are a common feature of synucleinopathies, particularly dementia with Lewy bodies (DLB). The Incomplete Letters (IL) subtest from the Visual Object and Space Perception battery is a brief visuoperceptual task that requires identification of 20 letters in varying degrees of image degradation. It remains unclear if the IL test is useful in the identification of visuoperceptual deficits in DLB.

Participants and Methods: Participants (n=41) were referred for neuropsychological evaluation as part of their neurologic workup for DLB. Participants met criteria for non-amnestic mild cognitive impairment (MCI, n=12), multidomain MCI (n=14), or possible/probable DLB (n=15). The IL test was administered during the baseline visit as part of a comprehensive battery of tests.

Results: The three groups did not differ in age or education. Participants with non-amnestic and multidomain MCI did not differ from each other in Dementia Rating Scale-2 scores (M=130, SD=4.5 vs M=131, SD=4.8), but performed significantly better compared with

DLB (M=116, SD=9.7). The DLB group obtained significantly lower IL scores (M=15.8, SD=3.3) compared with multidomain MCI (M=18.4, SD=1.3) but not non-amnestic MCI (M=17.4, SD=2.3). Across all participants, the IL test was correlated with the Wechsler Block Design subtest (r=.57, p<0.01) but not Judgment of Line Orientation (r=.25, p=ns) or the DRS-2 Construction subtest (r=.02, p=ns).
Conclusions: The IL subtest yields incremental information for the assessment of visual processing deficits in DLB when compared with other established neuropsychological tests.
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Epilepsy complicates verbal function of primary progressive aphasia
Masahito Takagi, Mikiko Okazaki, Mayu Hamanaka, Akihiko Unaki, Tetsuya Kimura
Objective: To describe verbal symptoms in a patient of primary progressive aphasia (PA) after generalized convulsion.
Participants and Methods: The patient is a 78 year-old Japanese female. She gradually developed non-fluent aphasia in her seventies. She has a 6-year history of epilepsy and was admitted to our hospital for a generalized tonic-clonic convulsion. On the first day, she was mute in spite of having no more convulsions or other neurological deficits. Over the following days she improved and was able to speak a few words, however, perseveration and naming errors were prominent. After a week, she could speak in full sentences. She was repeatedly examined using a Japanese version of Addenbrooke's Cognitive Examination-Revised (ACE-R) and a picture naming test. Two weeks later, her executive function and language ability were evaluated with Wisconsin Card Sorting Test (WCST), Trail-Making Tests (TMT), and the Japanese version of Western Aphasia Battery (WAB). Brain MRI and 123I-IMP-SPECT were obtained to exclude stroke or other neurological disorders.
Results: ACE-R score was 49 at first, and improved to 60. Her naming ability was impaired on a category basis: picture naming errors were observed in animals and fruits but not in stationery and vegetables. In WCST, only one category was achieved. TMT part A took 133 seconds, and part B was not accomplished. WAB showed that AQ was 67.5. Brain MRI revealed left frontal lobe atrophy, and SPECT depicted left frontal dysfunction.
Conclusions: Epilepsy may cause derangement of lexical retrieval and induce naming errors with PA after a period of complete mutism and perseveration.
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Multiple Sclerosis - Poster Session 2 - 14.30 - 17.00		
Number	**Presenter**	**Poster Title**
24	John DeLuca	Assessing everyday life performance using a web-based assessment: Actual Reality™
25	Rachel Goodwin	Evaluation of NeuroText as a memory aid for people with multiple sclerosis: a qualitative inquiry of patient feedback
26	Gabriel Leonard	Non-invasive neuromodulation combined with intensive cognitive and physical rehabilitation induces neuroplastic changes in patients with multiple sclerosis - an fMRI study
27	Micaela Mitolo	Network-based cognitive rehabilitation in patients with relapsing-remitting multiple sclerosis: functional and structural connectivity changes
28	Cristina Roman	Cognitive intra-individual variability (C-IIV) predicts brain atrophy in multiple sclerosis

Assessing everyday life performance using a web-based assessment: Actual Reality™
John DeLuca, Yael Goverover
Objective: Multiple Sclerosis (MS) results in cognitive impairments and negatively impacts aspects of everyday life. Yet current standard-of-practice methods for assessing everyday functioning in persons with MS rely heavily on self-report. Performance based measures to assess functional status are not detailed, sensitive and informative enough to capture the complexity of daily functioning in persons diagnosed with MS. The aim of this study is to develop and examine the Actual Reality™ (AR) approach for assessment, using an internet based tasks of AR.
Participants and Methods: 30 persons with MS and 30 healthy controls (HC) between the ages of 28 and 65. Participants were required to use actual internet sites to (1) book an airline ticket (2) buy cookies as a birthday present and (3) order pizza for a social event. Participants were assessed twice, three weeks apart.
Results: Participants with MS committed more errors, and required significantly more cues to perform the three AR tasks successfully compared to HC. The number of errors made, and number and quality of cues required to complete the AR task were similar among the three AR tasks. Significant practice effect was minimal, significant primarily in latency but not for type and number of errors made. Lastly, results showed moderate to large interrater reliability.
Conclusions: This research is a first step in demonstrating the psychometrics (test-retest and inter-rater reliability, and concurrent and discriminant validity) of a novel assessment that uses internet technology to enhance the accuracy, portability, and impact of everyday functioning assessments in MS.
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Evaluation of NeuroText as a memory aid for people with multiple sclerosis: a qualitative inquiry of patient feedback
Rachel Goodwin, Nadina Lincoln, Roshan das Nair, Andrew Bateman
Objective: Memory problems are reported in 40-60% of people with multiple sclerosis (MS). Research in the field of memory rehabilitation for people with MS is inconclusive and mainly studied through quantitative methodologies. This study aimed to examine feedback from participants who had been through a randomised controlled trial (RCT), comparing NeuroText with an active control. NeuroText is run by NeuroPage and sends reminder messages to people's mobile phones at pre-arranged times.
Participants & Methods: Semi-structured feedback interviews were performed following trial completion. As the RCT employed a crossover design, all participants had experienced the treatment and the control. Twenty-five participants took part, aged 30 to 72 years; 11 were male. Framework analysis was applied to the data.
Results: Seven major themes were identified and highlighted perceived benefits of NeuroText in everyday memory, mood and fatigue management, and what happened when the messages ended; short-term positive aspects of receiving the control messages, and what wasn't useful about them; and overall positive experiences of study participation and some minor initial concerns.
Conclusions: Participants heavily endorsed the usefulness of NeuroText, in multiple aspects of their everyday life, and some found the benefits remained once the intervention had stopped. Interestingly some participants also found the control messages to be of some benefit. This feedback highlights that it is beneficial to implement a qualitative element within the RCT methodology to better understand the patient experience of the intervention.
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Non-invasive Neuromodulation Combined with Intensive Cognitive and Physical Rehabilitation induces Neuroplastic changes in Patients with Multiple Sclerosis - an fMRI study
Gabriel Leonard, Yves Lapierre, Jen-Kai Chen, Rima Wardini, Joelle Crane, Alain Ptito
Objective: To study the effects of non-invasive tongue stimulation (using the Portable Neuromodulation Stimulator (PoNS™) combined with intensive Cognitive and Physical Rehabilitation on gait, balance, working memory and concomitant changes in the brain of Multiple Sclerosis (MS) patients.
Participants and Methods: Fourteen MS patients: randomized to 7 Active Stimulation (means: age=48; education=14.7 yrs; IQ=111; Female=4) and 7 in Sham Stimulation groups (age=50; education=16.7 yrs; IQ=113; Female=4). Subjects received 2 hours of intensive physical therapy and 20 minutes of working-memory training 5 days a week for 14 weeks. Task-related functional MRI (fMRI) using motor imagery and working-memory tasks were completed before, and following therapy. Comprehensive Sensory Organization (SOT), functional walking performance measures (DGI),

and extensive neuropsychological testing were administered pre and post therapy.
Results: All subjects improved on motor tasks. However, on the SOT, only those in the Active group showed significant improvement from baseline. fMRI showed significant blood oxygen-level dependent (BOLD) signal-changes in the primary motor cortex for the Active group, while the Sham group had increased activity in bilateral premotor cortices. Diffusion tensor imaging revealed decreased mean diffusity (MD) and radial diffusity (RD) in the left cortico-spinal tract of the Active group only. Performance was improved for both groups on working memory tasks, but increased dorsolateral prefrontal cortex activity was seen in the Active group.
Conclusions: These promising results suggest that PoNS™ stimulation combined with focused therapy enhances motor performance and working memory while driving neuroplasticity. A larger study is warranted to explore these findings further.
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Network-based cognitive rehabilitation in patients with Relapsing-Remitting Multiple Sclerosis: functional and structural connectivity changes
Micaela Mitolo, Basil Sharrack, Riccardo Manca, Annalena Venneri
Objective: Although a growing body of evidence has highlighted the role of cognitive rehabilitation in the management of cognitive dysfunction in patients with Multiple Sclerosis (MS), there is still no clear evidence for a validated therapeutic approach. We investigated the effectiveness of an intensive network-based cognitive rehabilitation program, specifically designed to promote the involvement and the synchronous co-activation of multiple areas of the brain, targeting multiple cognitive domains.
Participants and Methods: Twenty-nine patients with Relapsing-Remitting MS and an Expanded Disability Status Scale score of ≤5.5 were included in this study. All patients underwent a complete neuropsychological assessment and brain MRI including Resting-State fMRI and DTI at baseline and 6 weeks later. Patients in the experimental group (n = 15) received intensive network-based cognitive rehabilitation for 20 sessions (1 hour per day, 5 days a week, for 4 weeks). Patients in the control group (n = 14) received no cognitive treatment.
Results: At reassessment, the experimental group showed significant improvements in tasks assessing executive compared with the control group. A transfer effects was also found in a logical memory task indicating a generalization of the effects to untrained abilities. A reorganization of functional connectivity on fMRI was only detected in the experimental group who increased connectivity in the cuneus, lingual gyrus and in fronto-parietal regions and decreased connectivity in the inferior and middle occipital gyrus and in temporal areas.
Conclusion: These findings suggest that a network-based cognitive rehabilitation program, that stimulates multiple cognitive domains targeting distant areas simultaneously, might represent a valid therapeutic approach in MS.
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Cognitive Intraindividual Variability (C-IIV) Predicts Brain Atrophy in Multiple Sclerosis
Cristina A.F. Roman, Margaret Cadden, Peter A. Arnett
Objective: C-IIV, a measure of fluctuations in cognitive performance, has been shown to be a predictor of cognitive dysfunction in MS. What is still unclear, however, is how these fluctuations (i.e., C-IIV) relate to brain structure. Therefore, the current study aims to examine the predictive power of C-IIV to brain atrophy in MS.
Participants and Methods: Twenty-one individuals (4m, 17f) with MS were administered neuropsychological tests falling in the domains of processing speed, executive functioning(EF), and memory (3 composites of study). C-IIV scores were calculated by taking the standard deviation of each composite score. Participants returned approximately 5-years later and were scanned during a structural MRI protocol. FreeSurfer 5.3.0 was used to perform vertex-to-vertex group analyses of cortical thickness and to pull volumes for the thalamus, hippocampus, and amygdala.
Results: After controlling for multiple comparisons, vertex-to-vertex regression analyses showed that greater EF C-IIV predicted decreased thickness in the left rostral anterior cingulate (p=.018), while greater memory C-IIV predicted decreased thickness in the left rostral middle frontal (p=.016) and right post central gyri (p<.001). Controlling for estimated total intracranial volume, multiple regression analyses showed that greater EF C-IIV predicted decreased left hippocampus (p=.012) and right amygdala (p=.045) volumes.
Conclusions: To the authors' knowledge, this is the first study to examine the ability of the C-IIV to longitudinally predict atrophy. These data not only point to the predictive power of the C-IIV in MS, but they also present a possible avenue to predict neuropathological damage.
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Substance Abuse/Addiction/Alcoholism - Poster Session 2 - 14.30 - 17.00		
Number	**Presenter**	**Poster Title**
33	Omar Alhassoon	Role of group mismatching on education in verbal versus nonverbal memory differences among recently detoxified alcohol-dependent patients
34	Michela Balconi	Brain oscillations, inhibitory control mechanisms and rewarding bias in internet addiction
35	Sarai Boelema	The absence of differences in neuropsychological functioning between adolescent alcohol users and abstainers. Longitudinal findings from the TRAILS study
36	Laura Halpin	COMT Val^{158}Met allele may exacerbate methamphetamine-related learning dysfunction
37	Alena Javurkova	Cognition in chronic nonmalignant pain patients under long-term opioid therapy
38	Myung-Sun Kim	Neuropsychological profile of college students with binge drinking
39	Serge Walvoort	Measuring illness insight in patients with alcohol-related cognitive dysfunctions using the Q8 questionnaire: A validation study

Role of group mismatching on education in verbal versus nonverbal memory differences among recently detoxified alcohol-dependent patients
Omar Alhassoon, Kenneth Allen, Rick Stephan, Matthew Hall, Scott Wollman, Mark Stern, Christine Kimmel, William Thomas, Win Gongavatana, Julia Gamboa, Constance Dalenberg, Scott Sorg, Celina Sari, Igor Grant0
Objective: Demographic characteristics, such as age and education, have consistently been shown to be strongly associated with neuropsychological performance. With the advent of neuroimaging there appears to have been a shift in matching for age, sometimes at the expense of matching for education, since neuroimaging results are more likely to be affected by discrepancies in age. The current meta-analysis examines the effect of group level education mismatch on verbal versus nonverbal memory effect sizes in alcohol dependence research.
Method: Comprehensive searches were conducted utilizing nine research databases. Ninety one studies with 7,165 participants were selected and coded. The overall effect size for each type of memory (Hedges g) was calculated and discrepancies in age and education were examined using meta-regression.
Results: Findings initially suggested that verbal and non-verbal memory were equally affected by alcohol dependence. However, multivariate meta-regression revealed that participant matching plays a significant role in inflating the effect size of verbal memory, thus obscuring potential differences between verbal and non-verbal memory.
Conclusion: When examined meta-analytically, even small statistically non-significant discrepancies in education at the primary

study level resulted in inflated verbal effect sizes. This might explain the secular increase in reported verbal deficit in the neuropsychological literature examining the long-term effect of alcohol on the brain.
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Brain oscillations, inhibitory control mechanisms and rewarding bias in internet addiction
Michela Balconi, Roberta Finocchiaro
Objectives: Internet Addiction (IA) is considered a subtype of impulse control disorder, and a behavior related to rewarding system deficits. The present research aims to examine the neural correlates of deficits in inhibitory control and the rewarding mechanisms in IA. Internet Addiction Inventory (IAT) was applied to a sub-clinical sample.
Participants and methods: Cortical oscillations (frequency bands) and personality trait (Behavioral Inhibition System, BIS; Behavioral Activation System, BAS) were considered to explain IA. Oscillatory brain activity (delta, theta, alpha, beta and gamma) and response times (RTs) were monitored during the performance of a Go/NoGo task in response online gambling videos, videogames or neutral stimuli.
Results: BAS, BAS-R (BAS-Reward subscale), BIS and IAT predicted the low-frequency band variations, although in an opposite direction: reduced delta and theta and RTs values were found for higher BAS, BAS-R and IAT, in the case of NoGo for gambling and videogames stimuli; in contrast increased delta and theta and RTs values were ob-served for higher BIS.</p>
Conclusions: Two potential different subjects' clusters were suggested: with low inhibito-ry impulse control and rewarding bias (higher BAS and IAT); and with impulse hyper-control (higher BIS).
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The abscence of differences in neuropsychological functioning between adolescent alcohol users and abstainers. Longitudinal findings from the TRAILS study
Sarai Boelema, Zeena Harakeh, Martine van Zandvoort, Menno Reijneveld, Frank Verhulst, Hans Ormel, Wilma Vollebergh
Introduction: The aim of the present longitudinal study was to investigate the relationship between heavy drinking and neurocognitive functioning in adolescence, since it is suggested that this link is not as clear as is often assumed (Boelema et al., 2015). We assessed whether alcohol use was associated with (1) cognitive deficits, and (2) mental capacity.
Participants and methods: We used the data from the TRacking Adolescents' Individual Lives Survey (TRAILS) study (n=1596). Six groups of drinkers, ranging from non-drinkers to chronic drinkers, were identified based on individuals' drinking behaviour at ages 16 and 19. We measured neurocognitive functioning at age 19. Indicators of cognitive deficits were assessed with the Rey Auditory Verbal Learning Test-Dutch version, the Rey Osterrieth Complex Figure (ROCF), Wechsler Adult Intelligence Scale (WAIS) III Digit Span, and Verbal Fluency. Problem-solving was assessed using WAIS-III Block Design. Linear regression analyses were conducted, adjusting for basic neurocognitive functioning at age 11 (measured with the Amsterdam Neuropsychological Tasks) and confounders (e.g., gender, cannabis use and delinquent behaviour).
Results: (1) No differences in tests assessing cognitive deficits emerged between drinkers and non-drinkers. (2) Regarding mental capacity, non-drinkers outperformed other drinking groups, even the light drinkers. Post-hoc analyses did not show differences between light drinkers and other categories of drinkers on Block Design.
Conclusions: Drinkers showed less optimal mental capacity compared to non-drinkers, but the absence of a dose-response relationship between alcohol use and problem-solving skills suggests that alcohol may not account for this difference. Possible explanations for these findings are discussed.
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COMT Val^{158}Met Met Allele May Exacerbate Methamphetamine-related Learning Dysfunction
Laura Halpin, Sarah Murray, Arpi Minassian, Ronald Ellis, Robert Heaton, Igor Grant, Mariana Cherner, The TMARC Group
Objective: Methamphetamine (METH) alters brain dopamine levels, and chronic METH use is associated with neuronal dysfunction. Catechol-O-methyltransferase (COMT) regulates dopamine levels in prefrontal cortex. COMT Val^{158}Met polymorphisms cause differential dopamine catabolism, with the Met allele resulting in slower metabolism. The Met-associated increased bioavailability of dopamine may be advantageous for neurocognitive function among healthy carriers but could confer additional liability for METH users. Given involvement of prefrontal cortex in learning, we hypothesized that Met carrying (homo/heterozygous) METH users would show worse learning.
Participants and Method: COMT Val^{158}Met genotype was obtained for 78 methamphetamine dependent (METH+) and 70 healthy comparison (METH-) Caucasian men. There were 52 METH- Met, 18 METH- Val/Val, 65 METH+ Met, and 13 METH+ Val/Val. Within each METH group, genotype groups had comparable background characteristics. All received the Hopkins Verbal Learning Test-Revised and the Brief Visuospatial Memory Test-Revised. Deficit scores were derived from demographically adjusted total learning scores, averaged, and used as the dependent variable in a multiple regression analysis with METH group, Met allele, and their interaction as predictors.
Results: There was a significant METH x Met allele interaction (p=0.04). METH- Met and Val/Val carriers performed similarly [Mean(SD)=0.29(0.48) vs. 0.33(0.51), while METH+ Met performed worse than Val/Val [0.59(0.70) vs. 0.30(0.51)]. Differences were not explained by education or reading level.
Conclusions: The Met allele may exacerbate METH associated learning dysfunction, possibly resulting from reduced COMT inactivation of dopamine in prefrontal cortex and downstream effects on hippocampal function. Results suggest genetically influenced differences in vulnerability to METH effects.
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Cognition in chronic nonmalignant pain patients under long-term opioid therapy
Alena Javurkova, Dana Vondrackova, Jiri Kozak, Marian Spajdel, Jaroslava Raudenska
Objective: The aim was to assess intensity of pain, depression, neuroticism and cognitive domains in patients with chronic non-malignant pain under chronic opioid treatment.
Participants and Methods: We included 57 chronic pain patients (31 men, 26 women), with a mean age 56, mean FIQ=93, mean years of education 13, mean time of opioids use 6 years (fentanyl-20, oxycodon-17, buprenorphine-9, hydromorphon-4, tapentadol-6, morphine-1). All subjects were examined with standard neuropsychological battery (WAIS-III, COWAT, AVLT, ROCFT, EFTT, GP), reaction time (Compact SR), measurement of pain intensity (VAS), fear of pain (FPQ-III), depression (BDI-II) and neuroticism (EPQ-R).
Results: In the group of patients we found significant negative correlation between: pain intensity and verbal memory (learning and verbal delay recall AVLT) - stronger in women, depression and intellectual abilities (FIQ, VIQ, PIQ) - only in men, depression and visuospatial functions (ROCFT-copy, Blocks-WAIS-III), neuroticism and nonverbal memory (delay visual recall ROCFT). We found significant negative correlation between daily dose of opioids and verbal fluency (COWAT) and positive correlation between number of surgery and intensity of pain (VAS). We found significant negative correlation between number of years on opioids and fluid intelligence (PIQ). Linear regression model indicated that high depression could significantly predict lower level of PIQ.
Conclusions: We found influence of gender on relation between pain intensity, depression, neuroticism and cognitive domains. Pain, underlying depression and cognitive complains can be addressed in multidisciplinary treated approach.
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Neuropsychological profile of college students with binge drinking

Myung-Sun Kim, Jiyeon Yoo
Objective: Alcohol affects functions of prefrontal and temporal cortices, and alcohol use disorder and binge drinking share structural/functional abnormalities and cognitive deficits. This study investigated the neuropsychological profile of college students with binge drinking.
Participants and Methods: *Participants:* Based on the scores of Alcohol Use Disorder Identification Test (AUDIT) and Alcohol Use Questionnaire (AUQ), binge-drinking (n>=32, male: 8, female: 24) and control (n=32, male: 8, female: 24) groups were determined. *Neuropsychological tests*: The Rey-Osterrieth Complex Test (RCFT), California Verbal Learning Test (CVLT), Wisconsin Card Sorting Test and Stroop Test were administered to evaluate nonverbal memory, verbal memory, executive function and attention, respectively.
Statistical analysis: Scores of the AUDIT and AUQ were analyzed by one-way ANOVA, and the performances on the neuropsychological tests were analyzed by multivariate ANOVA.
Results: The binge-drinking and control groups differed on AUDIT (F(1,63) = 538.29, p < .001) and AUQ (F(1,63) = 97.34, p < .001), with binge-drinking group obtaining significantly higher scores compared to the control group. The two groups differed on the copy (F(1,62) = 6.05, p < .05), immediate recall (F(1,62) = 11.68, p <.01) and delayed recall (F(1,62) = 11.87, p <.01) of the RCFT, and the long-term free recall of the CVLT (F(1,62) = 13.37, p < .01). The binge-drinking group exhibited significantly lower scores than did control group.
Conclusions: College students with binge drinking showed difficulties with verbal and nonverbal memory, and the present results indicate that excessive drinking could affect memory even when drinking history is relatively short.
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Measuring illness insight in patients with alcohol-related cognitive dysfunctions using the Q8 questionnaire: A validation study
Serge Walvoort, Paul Van der Heijden, Roy Kessels, Jos Egger
Objective: One consequence of alcohol-related cognitive dysfunction is impaired illness insight, which may hamper treatment outcome. That is, patients typically underestimate the amount of alcohol they have used, underestimate the length of their alcohol addiction, and misjudge the severe and adverse consequences of alcohol addiction on daily life and health functioning. In this study, we validated the Q8, a short questionnaire for the assessment of illness insight, in patients with Korsakoff's syndrome (KS) and alcoholic controls.
Participants and Methods: Ninety-seven patients alcohol use disorder (AUD) patients completed the Q8 as part of their regular assessment procedure. Forty-two were diagnosed as KS patients (29 men; mean age=57.4; range 42-77), fifty-five as alcoholic controls (38 men; mean age=54.7; range 30-76). The Q8 was validated by comparing it to the Dysexecutive Questionnaire (DEX) and relating it to tests for processing speed, memory and executive function. Internal consistency of the Q8 and correlations between the DEX and the neuropsychological measures were computed.
Results: Internal consistency of the Q8 was acceptable (Cronbach's alpha=0.73) and significant correlations between Q8 and the DEX questionnaire and the neuropsychological measures were found (r-values>.26, p< 0.05), indicating that a higher degree of illness insight is associated with more self-reported cognitive complaints and better cognitive functioning.
Conclusions: The Q8 is a short, valid and easy to administer questionnaire for assessing illness insight in patients with moderate and severe alcohol-related cognitive dysfunction.
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HIV/AIDS/infectious disease - Poster Session 2 - 14.30 - 17.00		
Number	**Presenter**	**Poster Title**
40	Silvia Cañizares	Inflammation and cardiovascular biomarkers are associated with cognitive performance in HIV patients.
41	M.H.M. Ensing	Switching to a non-Efavirenz containing regime improves cognition in HIV-infected patients
42	Naledi Ketlogetswe	Judgment/problem-solving and neuropsychological test performance in non-demented older adults with HIV
43	Garau Maria	How do the immunological state and years of evolution affect cognitive performance in HIV patients co-infected with HCV?
44	Sean B. Rourke	Contributions of social determinants of health and medical comorbidities to neurocognitive performance in people living with HIV: Population health results from the Ontario HIV Treatment Network (OHTN) Cohort Study
45	Marta Sobańska	The numerical Stroop task helps detect subtle decline in executive functioning in HIV-infected patients on effective HAART

Inflammation and cardiovascular biomarkers are associated with cognitive performance in HIV patients. Combination antiretroviral therapy restores CD4+ cell counts and supresses viral replication. However, immune activation and inflammation may persist
Berta Torres, Silvia Cañizares, Agathe León, Montserrat Plana, Llucia Alós, Mattia Squarcia, Miguel Caballero, Xavier Filella, Carlos Reverter, Naira Rico, Esteban Martínez, Jordi Blanch, Araceli Roussaud, Felipe García-Alcalde
Objective: The aim of this work was to examine if some cognitive functions in HIV-infected patients were related to some inflammation and cardiovascular biomarkers.
Participants and Methods: 12 volunteers, who were part of a larger longitudinal study, were recruited from the Hospital Clinic of Barcelona (Spain). Selected patients were on cART (EFV/FTC/TDF), viral load < 37 copies, CD4+ >250 cel/mm3 and without any significant coinfection.
Data examined here are cross-sectional and obtained in the baseline measurement. Participants underwent comprehensive neurocognitive and medical evaluations. The neuropsychological assessment comprised executive functions, speed of cognitive processing, motor speed, and learning and memory. Inflammation was evaluated by determination of plasma IL-6 and TNF-α. D-dimer was used as a marker of cardiovascular disease. A correlational analysis was performed. Bonferroni's correction was applied to comparisons.
Results: IL6 was positively related with cognitive slowing. D-dimer was positively associated with cognitive and psychomotor slowing, and inversely with verbal learning. A trend was found between IL6 and mistakes in cognitive flexibility, and also between d-dimer and mistakes in cognitive inhibition. However, statistical significance disappeared when Bonferroni's correction was applied.
Conclusions: Data suggest that some inflammation and cardiovascular markers could adversely affect cognitive performance in HIV patients, even in patients receiving treatment in the setting of a chronic and stable disease and without a HAND diagnosis. Results should be interpreted with caution due to limitations of the study.
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Switching to a non-Efavirenz containing regime improves cognition in HIV-infected patients
M.H.M. Ensing, C.S. Hakkers, J.E. Arends, M.A.C. Emons, M.J.E. Van Zandvoort, A.I.M. Hoepelman
Objective: HAND is a frequent comorbidity in HIV-infected patients. The aim of this study is to assess the effect of switching Atripla (a regimen containing Efavirenz which is known for its adverse neurological of psychiatric events), to Eviplera (same as Atripla, without Efavirenz) on cognition, hypothesizing participants' cognition will improve on Eviplera.
Participants and Methods: Participants N=48[32:16] were virologically suppressed male HIV-infected patients aged 25-50 on Atripla, without neurocognitive complaints. They were randomized (2:1) to receive Eviplera (intervention group) or continue on Atripla (control group) both for 12 weeks. At baseline and week 12, patients underwent neuropsychological testing, assessing the following domains; conceptual organization, executive functioning, speed of information processing, learning, memory, attention and working

memory and motor speed. Raw scores were compared to normative data, and using a repeated measures ANOVA we assessed whether cognition improved on Eviplera.
Results: To date 12 patients completed the study; 9 intervention (age M=43, sd=6.1; years of education M=16.2, sd=0.15) and 3 control subjects (age M=41, sd=3.2; years of education M=17.33, sd=0.33). Preliminary results show no significant main effects for time or group. A significant interaction effect time x group, F(1,18)=12.046, p=0.003, this is further supported by post hoc testing that revealed a significant improvement in several domains, including speed of information processing, Memory, and Attention and working memory, with all p= <0.05.
Conclusion: Cautious interim analyses support the negative effect of Efavirenz on memory, speed of information processing, attention and working memory, in HIV-infected patients and it's reversibility. Results of the complete dataset will be discussed (N=48).
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Judgment/Problem-Solving and Neuropsychological Test Performance in Non-demented Older Adults with HIV
Naledi Ketlogetswe, Kathryn A. Wyman-Chick, Scott A. Sperling, Carol A. Manning
Objective: HIV-related neurocognitive impairment can predict impairment in complex ADLs We hypothesized that older adults with HIV who have impairment in clinician-rated judgment/problem-solving would have deficits in neuropsychological performance.
Participants and Methods: We analyzed data from 73 older adults with HIV (age=65.1 ±4.9; education=15.9 ±2.4; male=89.0%) from the National Alzheimer's Coordinating Center database. None of the participants met criteria for dementia based on MMSE cutoff score (≤25). Group status (Impaired n=14, Intact n=59) was determined by clinicians blinded to neuropsychological data using the Judgment/Problem-Solving category from the Clinical Dementia Rating Scale (Impaired= ≥0.5). A factorial MANCOVA was conducted controlling for age and education with the following variables: WMS-R Logical Memory, Trail Making Test A & B, WAIS-R Digit Symbol, WMS-R Digit Span, and Animal Fluency.
Results: A significant Box's M test (p<.001) was not indicative of homogeneity of covariance across groups; therefore, Pillai's trace was interpreted. There were no significant differences between the two groups on the neuropsychological variables, Pillai's Trace =.81, F=.685, df = (62), p=.703. Group differences were not significant for any of the individual neuropsychological tests.
Conclusions: In non-demented older adults with HIV, clinician-assessed judgment/problem-solving was not significantly associated with objective neuropsychological test performance. Clinician assessment, when based on subjective patient report, without the use of neuropsychological data, may be unreliable and insensitive to cognitive deficits. Consistent with existing literature regarding the unreliability of patient report, this highlights the need for neuropsychological testing in this population.
The NACC database is funded by NIA/NIH Grant U01 AG016976.
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How do the immunological state and years of evolution affect cognitive performance in HiV patients co-infected with HCV?
Garau Maria, Fernandez-Gonzalo Sol, Sala Montse, Navarro Marta, Turon Marc, Jodar Merce
Objective: Immunological state influences cognitive performance in patients with human immunodeficiency virus (HIV). However, it is unknown whether this relationship occurs in HIV patients co-infected with hepatitis C virus (HCV). The aim of this study is to explore how the immunological state, the years of VIH evolution and the HCV viral load can influence the performance in speed processing (SP) and executive functions (EEFF) tasks in HIV patients co-infected with HCV.
Participants and Methods: 27 patients with HIV co-infected with HCV were included. The clinical variables considered for the study were: immunological state (CD4), years of VIH evolution and HVC viral load (RNA). The Trail Making Test-A and the Digit Symbol were used to assess SP, and the Trail Making Test-B and total number of movements of Tower of London to assess EEFF.
Results: The bivariate analysis showed a significant association between CD4 and Digit Symbol (r=0.4; p=0.01). The HCV RNA levels were related with total number of movements of the Tower of London (r=4.79; p=0.013). Years of VIH illness evolution were not significantly associated with any cognitive variable.
Conclusions: The immunological state affects the processing speed, where more number CD4 cells indicates a better cognitive performance. However, The HCV RNA levels have an influence in executive function. Duration of the VIH illness does not seem to be relevant for the cognitive state of these patients. These results suggest that the immunological state influence cognition in our cohort of HIV-HCV
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Contributions of social determinants of health and medical comorbidities to neurocognitive performance in people living with HIV: Population health results from the Ontario HIV Treatment Network (OHTN) Cohort Study
Sean B. Rourke, Anita Rachlis, M. John Gill, Adriana Carvalhal, Colin Kovacs, Jason Brunetta, Gordon Arbess, Janet Raboud, Thomas Marcotte, Tsegaye Bekele
Objective: HIV can affect cognition in up to 50% of cases. As people with HIV are expected live almost normal lifespans, there is increasing attention to examine degree to which other social determinants of health (SDOH: demographics, mental health, addiction) and medical comorbidities may also contribute to neurocognitive (NC) impairments.
Participants and Methods: Sample included 739 individuals with 2,434 person-years of follow-up (mean age: 45 years; 77% male; 58% Caucasian) from two major urban HIV clinics in Toronto. Neuropsychological battery: WAIS-R Digit Symbol, WMS-III Spatial Span, Grooved Pegboard, and Hopkins Verbal Learning Test-Revised administered annually between 2007-2014. Individual test scores were transformed to z-scores using sample mean/SD. An overall z-score was computed by averaging z-scores of individual tests. Data on SDOH, medical comorbidities and HIV disease markers were extracted from charts. Generalized Estimating Equations method was used to examine longitudinal association between potential risk factors and NC functions.
Results: Demographic factors (older age, female gender, non-Caucasian ethnicity) and low nadir CD4 (<200 cells/mm3) were associated with lower overall NC performance as well as reduced verbal learning/memory, psychomotor efficiency, and working memory abilities (p-values <0.01). Diabetes was associated with lower levels of NC functions (β=-0.22, p<0.001) and specifically with decrements in psychomotor efficiency (β= -0.29, p<0.001) while current cigarette smoking was associated with worse psychomotor efficiency ability (β=-0.08, p=0.035).
Conclusions: Social determinants of health and medical comorbidities influence NC functions in people with HIV. Better management of comorbidities particularly diabetes and smoking remain important avenues of intervention to potentially ameliorate cognitive functioning.
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The Numerical Stroop Task helps detect subtle decline in executive functioning in HIV-infected patients on effective HAART
Marta Sobańska, Emilia Łojek, Agnieszka Pluta, Natalia Gawron, Bogna Szymańska, Adela Desowska, Mateusz Choiński, Anna Ambroziak, Tomasz Wolak, Mateusz Rusiniak, Ewa Burkacka, Andrzej Horban, Halina Jarosz, Anna Ścińska, Przemysław Bieńkowski, Stephen Rao, Bornstein Robert
Objective: The Numerical Stroop Task (NST) is often used to assess interference control, one of the core executive functions. The aim of the study was to explore the utility of the NST to examine executive functioning in HIV+ patients on effective HAART.
Participants and Methods: 103 males, 51 HIV+ (M=41, SD=11.8) and 52 HIV- (M=40.5, SD=12.0), participated in the study. HIV+ patients were on effective HAART for at least 1 year, had viral load <40 copies/mL and CD4 cell count >450 cells/mm3. Neuropsychological evaluation included: WAIS - Digit Span, Visual Memory Span, WCST, Colour Making Test, Verbal Fluency Test.
In the NST stimuli were presented in mixed design with 3 stimulus types: congruent, noncongruent and neutral pairs. The digit pairs were separated by the numerical distances of either 1 or 5. Task

performance was measured as error rate and average RT for each of the task conditions separately.
Results: HIV+ patients performed more poorly than HIV- only in tests examining working memory: Visual Memory Span and WAIS-Digit Span ($p<0.05$). In the NST the interference and facilitation effects were similar in both groups. Reated-measures ANOVA with condition and numerical distance was conducted on error rates and RT. HIV+ subjects were significantly slower in all trials and less accurate only in noncongruent (v. congruent) condition and in small (v. large) numerical distance comparing to healthy controls ($p<0.01$).</p>
Conclusions: These findings suggest that the NST may be an useful tool to detect even subtle decline of executive function in HIV+ patients who do not present clear cognitive deficits in neuropsychological assessment.
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Cancer - Poster Session 2 - 14.30 - 17.00		
Number	**Presenter**	**Poster Title**
46	Bénédicte Giffard	Cognitive performance and grey matter volume prior and after breast cancer chemotherapy
47	Sophie Rijnen	Computerized neuropsychological screening in clinical care for patients with low-grade gliomas: incidence and severity of cognitive deficits
48	Martine van Zandvoort	The feasibility of testing working memory in awake craniotomy in tumor Patients
49	Eline Verhaak	Cognitive functioning in patients with 1-10 brain metastases scheduled for treatment with Gamma Knife radiosurgery

Cognitive performance and grey matter volume prior and after breast cancer chemotherapy
Bénédicte Giffard, Armelle Viard, Robin Louail, Nastassja Morel, Hanae Bourjila, Djelila Allouache, Sabine Noal, Christelle Levy, Florence Joly, Francis Eustache
Objective: Cognitive deficits and grey matter atrophy have been demonstrated after chemotherapy for breast cancer [1-3]. Even prior to the start of adjuvant treatment, some studies have shown lower cognitive scores than expected [4, 5]. The aim of our study was to measure, in breast cancer patients before and after adjuvant chemotherapy, cognitive performances and structural brain volume, using correlations to take into account the potential effects of confounding variables.
Participants and Methods: Twenty-five women with breast cancer and 29 matched healthy controls completed MRI scans (VBM), neuropsychological tests and questionnaires (episodic memory, executive functions, attention, self-representation, anxiety-depression…) before adjuvant chemotherapy (baseline) and after chemotherapy completion.
Results: Before chemotherapy, patients showed lower scores in episodic memory and attentional processes than controls ($p<.03$). When anxiety was introduced as a covariate, decreases of grey matter in middle frontal and temporal gyri, and temporal pole were observed ($_{punc}<.001$, $k>80$), but no significant correlations were found between cognitive and volumetric measurements. One month after chemotherapy, a cognitive decline was not shown in patients, but an extension of the lower grey matter density was observed and decreases in new areas were revealed.
Conclusions: These results suggest that, before the start of chemotherapy and independently of anxiety level, mechanisms related to the cancer disease process and/or to the surgery, impact on brain structure and cognitive functioning. Chemotherapy appears to increase grey matter volume reductions.
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Computerized neuropsychological screening in clinical care for patients with low-grade gliomas: incidence and severity of cognitive deficits
Sophie Rijnen, Karin Gehring, Geert-Jan Rutten, Margriet Sitskoorn
Objective: Although there is a vast body of literature on cognition in patients with low-grade gliomas (LGG; WHO grade I or II), this study is first using a brief (30 min) computerized neuropsychological screening battery (cNPS; i.e., CNS Vital Signs) as clinical care to examine cognitive function in LGG patients at group and individual level.
Methods: LGG patients underwent cNPS 1 day pre-surgery (N=69), with follow-up 3 months post-surgery (N=54).
Results: Pre-operatively, patients demonstrated significantly lower means on 6 out of 7 domains assessed: memory, reaction time, cognitive flexibility, processing speed, complex attention, and executive function, compared to healthy controls (HC; 1,069 American subjects). Effect sizes were small, Cohen's d_s ranging from -.21 to -.36. Post-surgery, there were no differences between patients and HC anymore, except for memory where performance was still lower function, compared to healthy controls (HC; 1,069 American subjects). Effect sizes were small, Cohen's d_s = -.49. Pre-operatively, 24% of the patients scored low, and another 25% scored very low (i.e., respectively 1.5 or 2 standard deviation below average) in at least one domain. Post-surgery, respectively 30% and 15% of the patients scored within the low or very low range on at least one domain.
Conclusions: In line with studies using conventional neuropsychological tests, the cNPS demonstrated that pre-surgery, LGG patients are faced with mild cognitive dysfunction in several domains. Post-surgery, performance did not differ from HC, except for the memory domain for which performance still deviated from HC. Practice effects and surgery effects will be further examined. Selection bias was minimal and results are generalizable to LGG patients undergoing surgery.
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The feasibility of testing Working Memory in Awake Craniotomy in Tumor Patients
Martine van Zandvoort, Irene Huenges Wajer, Carla Ruis, Lana Donse, Marike Broekman, Pierre Robe
Objectives: Intraoperative neuropsychological testing can be used to prevent cognitive impairments as a result from tumour resection in eloquent brain area's. The current study was aimed at investigating the feasibility of the digit span as a working memory (WM) test for intraoperative purposes and evaluates if intraoperative WM testing leads to preservation of WM postoperatively.
Methods: In 81 glioma patients undergoing awake brain surgery, WM was pre- operatively, intra- operatively and post operatively tested using the digit span. Surgical areas in which mapping of WM with cortical stimulation was feasible are mapped and of differences in pre- and postoperative performance were examined.
Results: Testing with the digit span was feasible during all awake brain surgeries included in this study. Besides WM, the digit span also gave an impression about patients' alertness. In all patients tested with the digit span intra-operatively no decline in WM performance was found when comparing pre-operative and post-operative results.
Conclusion: Besides measuring the WM during a formal neuropsychological examination, the digit span test is feasible during awake brain surgery and by intra-operatively use able to prevent areas, which are involved from WM impairments.
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Cognitive Functioning in Patients with 1-10 Brain Metastases scheduled for treatment with Gamma Knife radiosurgery
Eline Verhaak, Wietske C. M. Schimmel, Patrick E. J. Hanssens, Karin Gehring, Margriet M. Sitskoorn
Objective: The majority of patients with brain metastases (BM) already have cognitive deficits prior to treatment due to the BM itself, or due to epilepsy or medication use (i.e. corticosteroids, anti-epileptic drugs, chemotherapy). Because cognitive functions are essential for our daily life, and are related to therapy compliance and quality of life in general, a full understanding of cognitive functioning is essential.
Participants and Methods: The patient population consists of adult patients with 1-10 newly diagnosed BM on a triple dose contrast-enhanced MRI-scan, KPS ≥70, and stable extracranial disease. A comprehensive neuropsychological test battery is used to assess

cognitive functioning at baseline (HVLT-R, COWA, WAIS Digit Span and Digit Symbol, TMT A and B, Pegboard). In addition, health related quality of life (FACT-BR), depression, anxiety (HADS), and fatigue (MVI) are determined. The current study concerns the baseline measurements of an ongoing prospective observational study to evaluate (long-term) cognitive functioning in patients with BM after treatment with Gamma Knife Radiosurgery (GKRS) including follow-up at 3, 6, 9, 12,15 and 21 months (cognitive testing) and 3-monthly MRI scans. Secondary endpoints are overall survival, local control, and development of new brain metastases.
Results: Baseline results on cognitive performance and patient-reported outcomes of the first 15-20 patients will be presented at the conference.
Conclusions: The conclusions of the current study add to the knowledge on cognitive functioning in patients with BM and may result in implementation of standard cognitive screening prior to GKRS.
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Cross cultural - Poster Session 2 - 14.30 - 17.00		
Number	**Presenter**	**Poster Title**
50	Jerzy - Marek Celinski	Toward a culturally fair comparison between CARB and PsychoAssistant.
51	Aparna Dutt	Adaptation of the ACE III naming test for the Bengali speaking population: Approach to reduce cultural bias
52	Noorjehan Joosub-Vawda	Aspiring towards a model of cross-cultural neuropsychological rehabilitation in South Africa
53	Ranita Nandi	Cognitive abilities and knowledge base in urban Indian Illiterates: A pilot study
54	Tyler Owens	Foreign language triage service for neuropsychological assessment in an academic medical center: A program development case study
55	Arleta Starza-Smith	Cultural complexity in paediatric neuropsychological assessment and formulation
56	Parisuth Sumransub	Validity of Thai Addenbrooke's Cognitive Examination III (Thai-ACE III) and Thai Prospective and Retrospective Memory Questionnaire (Thai-PRMQ) in the detection of early stage Alzheimer's disease
57	Sze Yan Tay	Effects of cognitive reserve on performance of MOCA in healthy elderly adults
58	Sze Yan Tay	Validity and utility of the Singapore Famous Faces Test (SFFT) in the detection of cognitive impairments
59	Nataliya Varako	East and West traditions in neuropsychological rehabilitation: building bridges

Toward a Culturally Fair Comparison between CARB and PsychoAssistant
Jerzy-Marek Celinski, Lyle M.III Allen,
Objective: Compare the sensitivity of two SVTs while minimizing cultural bias. Psycho Assistant (PA) involves recognition of overlearned "iconic" material that should not be affected by head injury. PA utilizes immediate initial feedback and contingent retraining of trivial visual information before retesting in the second subtest (PA-RET). CARB involves immediate identification of numeric stimuli following brief minimal distraction.
Participants and Methods: A total of 249 Toronto compensation claimants were given CARB and Psycho Assistant (PA) in their evaluation. Patients were 47% female and averaged 42 years of age and 13 years of education. Binary logistic regression using backwards LR elimination (in two steps) was used to assess demographic variables and relative classification rates.
Results: Patients failing either SVT were significantly older, and those failing PA-RET were less educated (average 2 years). Predicting PA-RET failure using demographic variables at 95% specificity identified only 23% of patients, but adding CARB scores increased sensitivity to 52% (83% overall classification). However, predicting CARB failure was not aided by demographics and the addition of PA-RET ***scores*** at 95% specificity only identified 29.5% of patients (78% overall).
Conclusions: Sensitivity concordance between CARB and PA-RET was low at 95% specificity. However, the average overall classification rate exceeded 80%. It thus appears to be a useful measure that is unlikely to over-diagnose poor effort. While PA may be less sensitive than other SVTs, it has recently been shown to be more closely related to measures assessing overlearned knowledge, as compared with CARB, WMT and TOMM.
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Adaptation of the ACE III Naming Test for the Bengali speaking population: Approach to reduce cultural bias
Aparna Dutt, Ranita Nandi, P.Sulakshana Rao, Pallavi Bhargava, Subha Goplakrishnan, Amitabha Ghosh, Jonathan J Evans
Objectives: The naming test from the Addenbrooke's Cognitive Examination (ACE) III will be presented as an example to discuss approaches which can be adopted for item selection for reducing potential cultural biases during test adaptation and evaluate the statistical characteristics of the individual items including item difficulty and item discrimination.
Participants & Methods: The study was conducted in Kolkata, a city in eastern India. Initially, we administered 23 items from the naming tests of the English and the different Indian ACE-R versions to healthy Bengali speaking literate adults for determining image agreement, naming and familiarity of the items. Eleven items were identfied as outliers. We then included 16 culturally appropriate items that were semantically close to the items in the selected ACE-R versions of which 3 were identified as outliers. The final corpus consisting of 25 items were administered to 30 patients diagnosed with Alzheimer's disease and vascular dementia and 60 healthy controls matched for age and education for determining which items in the corpus best discriminated patients and the controls and also their difficulty levels.
Results: The ACE III Bengali naming test with an internal consistency of .76 included 12 psychometrically reliable, culturally relevant high naming-high familiarity and high naming-low familiarity living and non-living items. Item difficulty ranged from .52 to .94 and had discrimination indices ≥.44.
Conclusions: Adaptation of neuropsychological tests at the content level is required to reduce cultural bias not only across different countries but also within the same country using item response theory methods.
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Aspiring Towards A Model Of Cross-Cultural Neuropsychological Rehabilitation In South Africa
Noorjehan Joosub-Vawda, Gert Kruger, Pieter Basson,
Objectives: The aim of this poster presentation is to examine cultural and societal strengths that, collaborating with international evidence-based practice guidelines could be incorporated into a contextual, less resource-intensive model for neuropsychological rehabilitation in this country. Characteristics of the South African context that make the implementation of international NR practices difficult include socioeconomic disparities, sociocultural influences, lack of accessibility to healthcare services, and poverty and unemployment levels. Most models of NR have been formulated in developed countries; however, the political and socioeconomic landscape in South Africa necessitates more resourceful and contextual interventions.
Methods: An exploratory, descriptive research design based on programme theory will be followed in the development of a South African model of neuropsychological rehabilitation. In particular, Van Hecke et al.'s (2011) procedure focusing on complex interventions will be used. The preliminary model is based on Phase One: Collection of the building blocks needed for the intervention.
Results: Taking into account understandings of etiology and healing in this context, where beliefs about witches, black magic, ancestral spirits and supernatural forces are common, is important to planning rehabilitation interventions. Collaboration between cultural and societal strengths, and scientific NR insights, is the way forward for

NR in the developing world. This is particularly relevant for the multicultural situation in South Africa.
Conclusions: The preliminary model demonstrated in this poster will attempt to build on the strengths of South African communities, incorporating valuable evidence from international models to serve those affected with brain injury in this context.
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Cognitive Abilities and Knowledge Base in Urban Indian Illiterates: A Pilot Study
Ranita Nandi, Aparna Dutt, Jonathan J. Evans
Objective: To explore cognitive abilities and knowledge base in urban Indian illiterates for developing ecologically valid bedside cognitive assessment tools.
Participants and Methods: A structured interview schedule was administered to 40 cognitively healthy Bengali speaking illiterates with mean age of 62.3 (±11.28) residing in Kolkata, in Eastern India. The questions explored their abilities and knowledge pertaining to orientation, memory, calculation and visuoconstructional function tasks included in currently available standardized cognitive screening tools in India.
Results: Less than 50% of the sample knew the date, state, police station, post office and country correctly. Further probing indicated that they do not routinely keep track of these items. With respect to calculation ability, 32.5% of the sample had knowledge about numbers, of which 31% had knowledge of subtraction. The most common strategies used for simple calculations were seeking other's help and finger-based counting. None had the ability to count backward. In the visuoconstructional domain, even though 40% of the individuals could hold a pencil correctly, 88% of these individuals never had to use a pencil in their everyday lives.Forty-eight percent had the concept of a circle. Ninety three percent correctly described the attributes of a human face but none had previously drawn a human face. None of the individuals needed to remember an address as they are accompanied by others or seek other's help by showing the address.
Conclusion: Traditional cognitive screening tools are not appropriate for use with people who are illiterate, and we urgently need novel approaches for this group.
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Foreign Language Triage Service for Neuropsychological Assessment in an Academic Medical Center: A Program Development Case Study
Tyler Owens, Kamini Krishnan, Amanda Lucchetti, Alissa Butts, Jane Cerhan
Objective: Neuropsychologists working in large medical centers are increasingly likely to encounter culturally and linguistically diverse patients. To provide ethical care to such patients, additional consideration of their circumstances, abilities, and culture helps determine the appropriateness and content of neuropsychological evaluation. Barriers to care include having little contact with patients before seeing them in clinic, and thus, limited information to determine the utility of neuropsychological assessment. The purpose of this study is to review the implementation of a Foreign Language Triage (FLT) service at a large medical center and discuss implications for care.
Participants and Methods: Foreign language consultations were triaged to determine if specialized assessment would be needed. Factors considered included country of origin, current residence, English proficiency, educational background, need for an interpreter, and ability to return for follow-up. Recommendations were then made to continue with a clinical interview, conduct a brief or comprehensive neuropsychological assessment, or decline the referral.
Results: Over a two-year period, 92 patients were seen through the FLT service at the Mayo Clinic in Rochester, Minnesota. Forty-two percent of patients were given modified neuropsychological testing. We will describe demographic factors, language of testing, referring concerns, and other decision-making factors.
Conclusions: Benefits of an FLT service include having sufficient preparations to accommodate patient needs, improving communication and coordination with other providers, and reducing unnecessary resource demands on patients. Future directions include how to systematize the review process among providers and increase access to instruments that may provide more culturally sensitive and clinically useful information.
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Cultural Complexity in Paediatric Neuropsychological Assessment and Formulation
Arleta Starza-Smith, Ellie Williams, Cathy Grant
Objectives: In the UK, linguistic and cultural diversity is increasingly evolving, incorporating complexities from European and world-wide migration. While interpreters can bridge a gap in understanding between healthcare professionals and patients from diverse backgrounds, the implications of cultural differences for specialist Paediatric Neuropsychology services go beyond the language barrier. We highlight the contrast of challenges concerning specific linguistic and cultural background that impact upon neuropsychological assessment and formulation.
Participants and Methods: We present the cases of a Central European migrant (CE) and a Central African migrant (CA), post-TBI. Neuropsychological assessments - including the Wechsler Intelligence Scale for Children (WISC IVUK), Children's Memory Scale (CMS), Rey-Osterrieth Complex Figure, Delis-Kaplan Executive Function System (D-KEFS) and the Wechsler Non-Verbal Scale of Ability (WNV) - were administered to both children. The interview and the WISC were conducted in the CE's native language. The Strengths and Differences Questionnaire (SDQ) was administered in both children's native language.
Results: Both children showed impairment on measures of intelligence, memory and executive function. CE showed severe difficulties with language on tests delivered in his native language and English. For CA, disentangling pre-existing effects of developmental issues and psychological trauma pre-migration from effects of the TBI was complex.
Conclusion: We highlight that cultural challenges to neuropsychological assessment and formulation vary depending on the specific cultural background of the child. Assessment and formulation of children migrating from within European countries might pose less complex challenges than those migrating from outside of Europe, where linguistic and cultural diversity is more pronounced.
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Validity of Thai Addenbrooke's Cognitive Examination III (Thai-ACE III) and Thai Prospective and Retrospective Memory Questionnaire (Thai-PRMQ) in the detection of early stage Alzheimer's disease
Parisuth Sumransub, Jonathan Evans
Objectives: The number of people being diagnosed with Alzheimer's disease (AD) is increasing in Thailand. However, there are very few cognitive assessment tools that have been validated for the assessment of dementia in Thai. The present study presents a preliminary validation study of a T- ACE III and a T- PRMQ.
Methods: The PRMQ was translated to Thai and adapted to the cultural and social context of Thailand. The T-ACE III used was the adapted version by Thammanart et al. (2015). Both T-ACE III and T-PRMQ were administrated with 26 healthy controls (HC) and 32 outpatients diagnosed independently with early stage of Alzheimer's disease (AD).
Results: There was no difference in age and education between the groups. A ROC analysis showed that the T-PRMQ self – report version did not differentiate the groups well (AUC = 0.593, $p < 0.152$). The ROC analysis for the T-ACE III (AUC = 0.752, $p < 0.001$) and the informant – rating version of PRMQ (AUC = 0.809, $p < 0.001$) were better, but differentiation of the groups was only fair-good.
Conclusion: This preliminary analysis suggests that the T-ACE III and T-PRMQ may be useful as part of the process of dementia assessment. However, given the levels of sensitivity/specificity, neither instrument should be used as standalone diagnostic instruments and should therefore be used cautiously in conjunction with a detailed clinical history.
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Effects of cognitive reserve on performance of MOCA in healthy elderly adults

Sze Yan Tay, Jan Paolo Macapinlac Balagtas, Shahul Hameed, Christopher Gabriel

Objective: Past studies concerning the cognitive reserve theory suggests that higher education, a marker of cognitive reserve, is associated with a lower prevalence and risk of dementia and slows down cognitive decline in normal elderly. However, studies have suggested a differential protective effect on different cognitive abilities, which follows a decreasing trend with age. Studies examining this effect across different education groups are limited.
Participants and Methods: The cognitive reserve theory in a population with large variation in education levels is investigated using the Montreal Cognitive Assessment (MoCA).
215 participants at public cognitive screening were administered the MoCA test. Analysis was conducted to determine effects of education(< 6yrs, 6-10yrs, >10yrs) on MoCA-total and subdomain scores within the age groups of 51-60yrs old, 61-70yrs old and 71-80yrs old.
Results: Statistical analysis showed a linear declining trend with better MoCA-total performances in the younger age groups across different education groups. Overall effect was found across the groups for MoCA-total, $F(8, 200) = 12.116$, $p < .001$, with middle and high education groups in their 60s and 70s performing better than their low education age-counterparts, but reaching equivalence to the performance of the low education group in their 50s. On the subdomains, this trend is seen only within the 61-70yrs old in attention, drawing and executive functioning.
Conclusions: In those with middle and high education, the cognitive decline is seen from their 60's, performing equally to those with <6years education in their 50s, suggesting the working of cognitive reserve. A differential effect on different cognitive domains is also present.
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Validity and utility of the The Singapore Famous Faces Test (SFFT) in the detection of cognitive impairments

Sze Yan Tay, Shahul Hameed, Amanda Rui Yun Low, Jin Ling Yu, Jan Paolo Macapinlac Balagtas, Christopher Gabriel

Objectives: The Singapore Famous Faces Test (SFFT) was developed based on existing "Famous Faces Tests" (FFTs) for the purpose of assessing remote visual memory using a locally developed set. Studies have established FFT's utility in identifying early dementia. According to Josh/Ribot's law, it has also been theorized that such memories will follow a temporal gradient with preserved older memories relative to newer ones. We aim to examine the validity of the SFFT in distinguishing between individuals with AD and normal controls, and the pattern of performance across age in a normal population.
Participants and Methods: The SFFT consisting 56 items of famous local entertainers, politicians, criminal/law and sportspersons represented from the past 6 decades was first administered a group of 9 patients with AD, 7 with MCI, and 11 age-and-education-matched normal controls; and subsequently to 113 normal participants. Scores across the 56 items were totalled to form an overall score, and subscores were tabulated by summing items from each of the decades.
Results: One-way ANOVA showed a difference in overall face recognition abilities across groups [$F(2,24)=12.40, p<.001$), with post-hoc analysis showing significant difference between AD and controls (Mean difference=33.52,$p<.001$). Within the normal participants age groups, a linear declining trend across decades, with generally better abilities in recognizing faces from earlier decades was shown in 40-49[$F(5,150)=7.10, p<.001$], in 50-59 [$F(5,216)=6.02, p<.001$], 60-69[$F(5,210)=17.80, p<.001$] and 70-79[$F(5,78)=4.34, p=.002$].
Conclusions: The SFFT is sensitive in detecting the temporal gradient in recall, as well as discriminating between individuals with cognitive impairments and those without, suggesting its validity and usefulness in detecting cognitive impairments in Singapore.
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East and West tradition in Neuropsychological Rehabilitation: building bridges

Nataliya Varako, Maria Kovyazina, Yuri Zinchenko, Olga Dobrushina, Galina Ivanova,

Objectives: Both in Russian and foreign neuropsychological traditions there are theoretical and methodical difficulties: 1) to establish the patients actual level in tasks and in the use of cognitive functions; 2) to plan the rehabilitation goals; 3) to make connections between neuropsychological assessment, rehabilitation and ICF domains.
Participants and Methods: Approaches to rehabilitation after brain injury differ. In Russian school, rehabilitation of higher cortical functions relates mostly on L.S. Vygotsky-A.R. Luria traditions. Rehabilitation is understood as functional rebuilding of the whole functional system. This approach shows impressive results in rehabilitation of speech, writing, reading and calculation. In West tradition, cognitive rehabilitation addresses not only cognitive functions, but everyday life, and does not suppose profound functional reorganization of the system. Development of holistic approach allowed inclusion of the rehabilitation into real life activities with inclusion of emotional and motivational sphere.
Results: Benefits of traditional Russian approach is its systematicity, limitation – in neglection of the spheres that cannot undergo systemic reorganization. Benefits of West approach include holistic work with any deficits, limitations – absence of systematicity. Another approach to rehabilitation, complex A.N. Leontiev approach based on activity, is suggested. Performance may be realized on three levels: operations, actions (including mental) and activity that is based on motives and meanings and is realized in behavior.
Conclusions: The proposed model includes cognitive-behavioral, holistic and traditional Russian approaches to rehabilitation and may be feasible for the goal of establishment of rehabilitation prognosis, potential and effect in accordance with ICF.
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Memory Functions - Poster Session 3 - 08.30 - 10.30		
Number	**Presenter**	**Poster Title**
1	Emily Aiken	An individualized approach to cognitive rehabilitation of prospective memory deficits in individuals with traumatic brain injury
2	Linas Bieliauskas	Predicting subjective cognitive complaints: Contributions from depression, somatic preoccupation, and education level among older inpatient veterans admitted to a post-acute clinic
3	Liam Dorris	Sleep and forgetting in children with genetic generalised epilepsy.
4	Aparna Dutt	False recognition in behavioural variant frontotemporal dementia and Alzheimer's disease – disinhibition or amnesia?
5	Faraneh Vargha-Khadem	Distinct white matter correlates of intelligence and memory: Evidence from developmental amnesia
6	Kazuki Nakamichi	Dissociable effects of facial expression and facial impression on memory for faces in Williams syndrome
7	Amanda Ng	Metacognition in prospective memory – A meta-analysis
8	Paeksoon Park	Remembering the past and imagining the future in patients with gambling disorder: a preliminary report
9	Judith Salvador-Cruz	The use of semantic strategies in the development of memory in elementary school children
10	Eli Vakil	Conceptual and perceptual processes involved in context effect in memory: Behavioral and eye tracking measures
11	Marta Agata Witkowska	Can you train your prospective memory by playing video games? A professional players perspective

An individualized approach to cognitive rehabilitation of prospective memory deficits in individuals with traumatic brain injury

Sarah Raskin, Emily Aiken, Lori Berger
Objectives: To determine the optimum rehabilitation strategy for prospective memory (PM) deficits in individuals with traumatic brain injury.
Participants and Methods: Adults between the ages of 18 and 60 diagnosed with traumatic brain injury at least 1 year prior to participation but with no other neurological or psychiatric diagnoses. Randomized controlled trial with two groups. All participants given the Memory for Intentions Screening Test (MIST) and measures of PM in daily life. One group received active treatment and the other received attention control in the form of brain injury education. Participants assigned to the active treatment group will be assigned to 1 of 3 cognitive rehabilitation therapies: attention process training (APT), PM training in the form of rote repetition, or executive function training in the form of goal management training (GMT); based on their performance on pre-rehabilitation assessments. Both active and control treatments will be administered across 10 hourly sessions over a period of 6 weeks.
Results: Individuals with PM deficits showed improvement on the MIST and measures of daily life after training but the participants in the placebo condition did not.
Conclusions: Individuals with PM deficits may fail PM tasks for a number of reasons. Thus, an individualized treatment approach may be necessary. In this study individuals were assessed in attention, memory and executive functions before treatment and given specific treatment in a hierarchical fashion. This lead to gains not just on a standardized measure but in performance in daily life.
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Predicting Subjective Cognitive Complaints: Contributions from Depression, Somatic Preoccupation, and Education Level among Older Inpatient Veterans Admitted to a Post-Acute Clinic
Katherine Kitchen Andren, Julija Stelmokas, Robert Spencer, Annalise Rahman, Linas Bieliauskas
Objectives: Cognitive complaints are common among older adults, but the mechanisms underlying such complaints are not well understood. We examined the influence of demographics, memory performance, depression, and somatic preoccupation on subjective cognitive complaints (SCC). It was hypothesized that depression and greater somatic concern, but not objective memory performance, would increase the likelihood of SCC after controlling for demographic factors.
Methods: We reviewed medical records of 261 predominantly male (95.0%) older (M = 65.98, SD = 11.05) inpatients at a Veteran's Affairs post-acute rehabilitation clinic. SCCs were measured using a single, dichotomously coded item. Age and years of education were entered as covariates. Predictor measures included memory performance (i.e., delayed free recall from the Hopkins Verbal Learning Test-Revised), somatic preoccupation (Modified Somatic Perception Questionnaire), and a positive depression screen (DSM-IV checklist). Hierarchical logistic regression analysis was used to evaluate the predictive utility of the aforementioned variables.
Results: Approximately half of participants (45.6%) endorsed a SCC. The final logistic regression model indicated that the five predictor variables together resulted in an increased likelihood of reporting a SCC, $\chi^2(5) = 23.76$, $p < .001$. Somatic preoccupation and depression incrementally increased likelihood of reporting a SCC, after controlling for the significant effect of higher educational attainment. Age and objective memory performance did not contribute significantly to the likelihood of endorsing a SCC.
Conclusions: Somatic preoccupation and depression greatly increase the likelihood of SCCs. Therefore, SCCs should be viewed as a reflection of distress rather than an indication of objectively-defined cognitive impairment.
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Sleep and Forgetting in Children with Genetic Generalised Epilepsy.
Fiona Corrigan, Andrew Morley, Mary O'Regan, Stewart Macleod, Margaret Wilson, Ailsa McLellan, Sameer Zuberi, Liam Dorris
Objectives: This study aimed to investigate the relationship between sleep and rate of forgetting novel information in children with Genetic Generalised Epilepsy (GGE).
Participants and Methods: Nineteen participants with GGE were recruited from two tertiary neurology clinics in Scotland (14 female, 5 male; age range 9-16 years). Participants were screened and excluded if scoring ≤70 using the Wechsler Abbreviated Scale of Intelligence. The group median IQ was 88 (range 75-118). Ninety percent of participants were treated with AEDs. Actigraphy, sleep diaries and standardised questionnaires were used to measure sleep over a 7-day period. Rate of forgetting was measured using tests of memory (CMS; Word Lists and Stories) on days 1 and 7 of the study.
Results: No association was found between actigraphic measures of sleep efficiency or duration and rate of forgetting. Measures of sleep disturbance were mixed, with sleep onset latency found to be associated with rate of forgetting on the Word Lists test. However, increased wake after sleep onset was associated with decreased rate of forgetting.
Conclusions: There was limited evidence of a relationship between some actigraphic sleep parameters and rate of forgetting for verbal information. These preliminary results were equivocal and likely biased by the small sample size, high prevalence of lower IQ, and refractory seizures. We discuss the need for further research to establish the nature of the relationship between sleep and rate of forgetting in children with GGE, a group known to be at higher risk of academic under-achievement.
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False recognition in behavioural variant frontotemporal dementia and Alzheimer's disease – disinhibition or amnesia?
Emma C. Flanagan, Stephanie Wong, Aparna Dutt, Sicong Tu, Maxime Bertoux, Muireann Irish, Sulakshana Rao, Amitabha Ghosh, Michael Hornberger, Michael Hornberger
Objectives: Episodic memory recall processes in Alzheimer's disease (AD) and behavioural variant frontotemporal dementia (bvFTD) can be similarly impaired, whereas recognition performance is more variable. A potential reason for this variability could be false-positive errors made on recognition trials and whether these errors are due to amnesia *per se* or a general over-endorsement of recognition items regardless of memory.
Participants & Methods: Recognition memory performance on the Rey Auditory Verbal Learning Test (RAVLT) in 39 bvFTD, 77 AD and 61 control participants from two centres (India, Australia), as well as disinhibition measured using the Hayling test was analyzed.
Results: Whereas both AD and bvFTD patients were impaired on delayed recall, bvFTD patients showed intact recognition when considering only the number of correct hits, which is the standard recognition outcome. However, both patient groups endorsed significantly more false-positives than controls, and bvFTD and AD performed equally poorly when a recognition sensitivity index was considered (correct hits - false-positives). Furthermore, measures of disinhibition were significantly associated with false positives in both groups, with a stronger relationship with false-positives in bvFTD.Voxel-based morphometry revealed that neural correlates of false positive endorsement overlapped between bvFTD and AD, with both patient groups showing involvement of prefrontal and Papez circuitry regions in both patient groups.
Conclusion: The findings suggest that false-positive errors on recognition relate to similar mechanisms in bvFTD and AD, reflecting deficits in memory processes and disinhibition. These findings highlight that current memory tests are not sufficient to accurately distinguish between bvFTD and AD patients.
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Distinct white matter correlates of intelligence and memory: Evidence from developmental amnesia
Anna Dzieciol, Kiran Seunarine, Mortimer Mishkin, Chris Clark, Faraneh Vargha-Khadem
Objective: Developmental amnesia (DA) is a selective episodic memory disorder which may result from exposure to hypoxic-ischaemic events early in life. Despite the systemic impact of these episodes, previous investigations have focused on characterising the resulting grey matter damage, with little attention given to white matter pathology. Here, we examine the extent, and neuropsychological correlates of white matter abnormalities in DA.
Participants and methods: Fifteen patients with DA (age range 10 – 35 years), 14 patients with hippocampal atrophy and memory

impairment (age range 8 – 16 years) and 29 age- and gender-matched controls participated. White matter abnormalities were examined using tract-based spatial statistics (TBSS; Smith *et al.*, 2006), a quantitative method of analysing diffusion tensor properties. Fractional anisotropy (FA) relates to the directionality of water diffusion, whereas mean diffusivity (MD) relates to the magnitude of diffusion regardless of its direction.
Results: Compared to controls, patients had global reductions in FA and widespread increases in MD throughout the core white matter tracts. The reductions in white matter microstructure were related to patients' intelligence, but not to their memory deficits.
Conclusions: These results show that hypoxia-induced damage in developmental amnesia extends beyond the hippocampal circuit into many areas of cerebral white matter. Despite this, intelligence and memory function have distinct neural substrates.
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Dissociable Effects of Facial Expression and Facial Impression on Memory for Faces in Williams Syndrome
Kazuki Nakamichi, Tomonari Awaya, Takeo Kato, Kiyotaka Tomiwa, Takashi Tsukiura
Objective: Williams syndrome (WS) is a neurodevelopmental disorder by a hemizygous deletion in chromosome 7. Previous studies have demonstrated that individuals with WS are relatively preserved in the processing of faces or happy facial expressions. However, little is known about how face memories in WS are modulated by the effects of facial expression and social impression of faces. In this study, to tackle this issue, we investigated face memories with emotional expressions in WS and healthy participants with typical development (TD).
Methods: 19 WS (mean age: 23.4) and 15 TD (mean age: 6.47) participants were presented with angry, neutral, or happy faces, and then memories for these faces were tested. After the memory test, all participants rated the approachability of these faces.
Results: In rating scores of the approachability for faces, WS showed significantly higher scores of approachability for happy faces than TD ($p<.01$). In the recognition of faces, compared to neutral faces, the emotion-related enhancement of memory for angry and happy faces was identified only in WS ($p<.05$). However, when scores of face memories were categorized by levels of the approachability rating, only TD showed a significant enhancement of memories for low and high approachable faces, compared to middle approachable faces ($p<.05$).
Discussion: The present findings suggest that the enhancement of face memories by facial expression in WS could reflect the preserved ability to process stimulus-driven emotions of faces in WS, but WS could be declined in the memory enhancement by the processing of social impressions for other persons.
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Metacognition in Prospective Memory – A Meta-Analysis
Amanda RJ Ng, Romola S Bucks, Shayne D Loft, Steven P Woods, Michael G Weinborn
Objective: Meta-prospective memory is awareness regarding memory for future intentions. Given that PM is critical to everyday memory functioning, understanding the extent to which people are aware of their PM abilities is important in informing rehabilitation strategies. Only a handful of meta-PM studies have been published, but methodological differences have resulted in mixed findings that might be clarified by applying a meta-analytic approach.
Method: An extensive literature search was conducted of published and unpublished materials, returning 5 studies (11 samples; N=574) that matched selection criteria. Meta-analysis was used to synthesize the results from studies examining the relationship between individuals predictions of their PM performance and their actual performance using correlation values (5 studies, 11 samples), and for under- or over-confidence using prediction-performance discrepancies (2 studies, 6 samples).
Results: There was a small, positive relationship between PM prediction and performance ($r = 0.19$, $p <0.01$). The direction of meta-PM inaccuracy (i.e., under- or over-confidence) could not be determined ($d = 0.01$, $p = 0.85$). Age, publication status, and experimental design, did not moderate the effects.
Conclusion: Results indicate that healthy adults do, in general, have some level of awareness of their PM abilities: those who predicted that they would do better on an upcoming PM task, did perform better. However, much of the variance in PM accuracy cannot be explained by PM predictions alone. Further studies are needed to explore factors such as cognition or mood that may contribute to meta-PM, and the impact meta-PM has on functional activities.
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Remembering the past and imagining the future in patients with gambling disorder: a preliminary report
Paeksoon Park
Objective: Impulsivity is a key cognitive feature in patients with gambling disorder (GD). Previous studies have demonstrated the relationship between their high discounting rate and their impulsivity trait. Additionally, shortened time horizons for the long-term future in GD, compared to healthy controls (HC), has been reported. However, little is known about the relationship between episodic memory and the sense of time described above in GD patients.
Participants and Methods: The current study investigated episodic memory throughout the past and the future, by using cued word recall in GD patients and age-matched HC. In this study, we recruited 10 GD patients (mean age 35.7) and 10 HC (mean age 32.6). Participants were asked to retrieve five events in each of four conditions (future thinking: 1 year, 10 years: F1, F10; autobiographical remembering: 1 year, 10 years: A1, A10), in which 10 cue words were used. The number of memories, total score and mean of vividness rating were computed in each condition.
Results and Conclusions: Results of the future condition showed a marginally significant main effect of group in the number of memories (GD< HC), and of condition in total score and a significant main effect of condition in vividness (F1>F10). In results of the past condition, there was a significant main effect of condition in each of three aspects (A1>A10). These findings suggest that GD patients exhibit a tendency of impairment in thinking of the future, with intact remembering of the past. This asymmetric outcome could reflect an important characteristic of episodic memory in GD patients.
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The Use of Semantic Strategies in the Development of Memory in Elementary School Children
Judith Salvador-Cruz, Carmen Armengol, Lucia Ledesma-Torres, Cristina Aguillon-Solis, Erik Eduardo Sanchez-Vielma, Ana Paola Mena-García, Laura Samanta Acevedo-Anota
Objective: Strategic recall is necessary for learning of all cognitive, academic and everyday life activities. The objective of this study was to analyze the relationship between semantic strategies and memory in school children.
Participants and Methods: We attended to 5 schools from México City and its suburbs; 90 students were selected (40% women and 60% men), children aged from 10 to 12 who didn´t present neurological and/or psychiatric history, and were enrolled in elementary education. Participants were applied the following measuring instruments in the following order: Neurological and/or psychiatric Background Questionnaire (Galindo and Salvador, 1996) and Complutense Children Spain Verbal Learning Test (TAVECI) (Benedet et al., 2001).
Results: The statistical analysis showed that the use of semantic strategies is directly proportional to the number of correct items in immediate recall ($\beta = .795$, $p<.01$), short term memory ($\beta = .585$, $p<.01$) and long term memory ($\beta = .620$, $p< .01$).
Conclusions: The level of storage and the use of semantic strategies increased with age, meanwhile the frequency of perseverations and intrusions, decreased. This points the active role of the executive functioning in memory, essential processes in academic and personal infant's development.
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Conceptual and perceptual processes involved in context effect in memory: Behavioral and eye tracking measures
Eli Vakil, Gili Betser Cohen, Noa Vardi
Objectives: The facilitation of memory for target stimuli due to similarity of context in the learning and testing phases is known as

the "Context Effect" (CE). In an attempt to determine whether CE is mediated by perceptual or conceptual processes, two groups participated in this study, each exposed to a different modality of context (pictures vs. words). In order to obtain a better understanding of the underling cognitive processes, eye movements were monitored.
Participants and Methods: Male faces were used as targets. The contexts were pictures of scenes in the Pictures group (*n*=27), and names of scenes in the Words group (*n*=28). Eye movements were recorded by the SMI RED-M remote eye-tracker with a sampling rate of 120Hz.
Results: Consistent with previous results CE emerged regardless of modality. Eye movements show that during learning, the Pictures group made more transitions between the faces and scenes than the Words groups made between the faces and words. During test, dwell-time in both groups was shortest for the repeat condition and longest for the new context condition.
Conclusions: In terms of the "Multifactorial model of CE", the pattern of these results suggests that while the Word group is more reliant on binding between target and context, the Picture group is more reliant on familiarity. The eye tracker results indicate different processing patterns for target and context in each group even at the learning phase. This study demonstrates the potential benefits of eye tracking to enhance understanding of underling cognitive processes.
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Can you train your prospective memory by playing video games? A professional player's perspective
Marta Agata Witkowska
Objective: E-sport is a phenomenon where e-sport athletes (pro-players) compete by playing computer games. Prospective memory (PM) is a set of processes or abilities to formulate, store and implement the purposes and intents in a set time frame or situation. A person with a well functioning PM effectively uses a set of methods that leads him/her to success in the execution of its intent. The main aim of the research was to create a general characteristics of pro-players cognitive functioning, especially PM, attention and executive functioning (EF).
Participants and Methods: A set of PM (Prospective-Retrospective Memory Questionnaire and an quasi-experiment based on CAMPROMT), attention (d2 test) and EF test (WCST) were administered to 60 young men: pro-players, amateurs and those who do not play video games (Control1 & Control2).
Results: ANOVA model for the CAMPROMT revealed a group (pro-players) main effect [F(2,58)=7,83; p<0,001; eta2 =0,15]. Pro-players demonstrated better PM functioning in both, time- and event-based PM, greater resistance to distractors and the ability to maintain cognitive control, and thus more effective EF functioning, then all Controls. Therefore a linear relationship between gaming proficiency, prospective memory and executive functioning was noted.
Conclusions: These advantageous characteristics are shown to likely be the result of pro-players' daily intense training regime which necessitates processing of complex and rapidly evolving information present in modern computer games. That leads to the conclusion that being a professional player increases the level of cognitive functioning and games may have a positive impact on selected cognitive functions, especially prospective memory.
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Emotional Processes - Poster Session 3 - 08.30 - 10.30		
Number	**Presenter**	**Poster Title**
12	Tanvi Dingankar	Emotional processing in anxiety using the face adaptation paradigm: An evoked potential study
13	Tricia King	An fMRI study of the individual variation in the oxytocin-mediated tendency to anthropomorphize in women
14	Catarina Kordsachia	Visual attention to the eye region of human faces predicts emotion recognition performance in Huntington's disease

Emotional Processing in anxiety using the face adaptation paradigm: An Evoked Potential Study
Tanvi Dingankar, Anne Richards
Objective: Previous research has shown a strong attentional processing bias in anxiety.
Participants and Methods: The current study examines differences in processing of emotional stimuli in high and low anxiety participants following adaptation to emotional exemplars. The sample consisted of 25 participants, 11 participants being in the high-trait anxiety group and 12 participants in the low-trait anxiety group. A visual adaptation paradigm was employed, which influences the perception of an ambiguous stimulus in a direction away from the previous sensory experience. Neutral and fearful facial expressions, along with their morphs, were used as adaptors and targets respectively. The study also investigated differences in the magnitude of adaptation between single and double adaptors trials. The former condition included a single fearful or a neutral adaptor whereas the latter condition included fear-fear, neutral-neutral and fear-neutral adaptors. The trials consisted of a single/double adaptor followed by a fear-neutral morph (target). The mean fearful responses following each morph were obtained along with the mean LPP (Late Positive Potential) amplitudes. **Results:** The ERP data revealed anxiety effects beginning at 600ms post-stimulus, whereby the high anxiety group showed stronger mean amplitudes following neutral adaptors than the low anxiety group, indicating enhanced emotional processing in the high anxious.
Conclusions: Although the highly anxious participants did not show a preference for fearful adaptors, they showed a strong interpretation bias for ambiguous stimuli (morphs). Findings from the study supported an emotion-congruency effect, with high anxious participants exhibiting positive amplitudes in all adaptor trials, suggesting a weaker influence of context and a dominant impact of mood.
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An fMRI study of the individual variation in the oxytocin-mediated tendency to anthropomorphize in women
Tricia King, Erin Hecht, Diana Robins, Pritam Gautam
Objective: Oxytocin is a neuropeptide implicated in a wide range of social cognition and behaviors. The goal of this study was to examine the role of intranasal oxytocin on the tendency to anthropomorphize animations of geometric shapes.
Participants and Methods: This randomized, double-blind, placebo-controlled study involved 28 women scanned during the luteal phase and not using hormonal contraception. The within-subjects design measured responses to animations after placebo baseline and after placebo or 24 IU of intranasal oxytocin one month later. Participants viewed animations of geometric shapes depicting either random movement or social interactions. Social videos were preceded by cues to attend to either social relationships or physical size changes.
Results: Oxytocin reduced activation in early visual cortex and dorsal-stream motion processing regions for the social > size contrast, reflecting reduced activity related to social attention. Oxytocin reduced endorsements that shapes were social and this correlated with reduction in neural activation. Participants who perceived less social relationships at baseline were more likely to show oxytocin-induced increases in a broad network of regions involved in social perception and social cognition, suggesting that lower social processing at baseline may predict more positive neural responses to oxytocin.
Conclusions: Intranasal oxytocin reduced the behavioral and brain activation markers of anthropomorphizing. These results are consistent with prior work that found the effects of intranasal oxytocin in females is opposite of the typical observed prosocial effects in males. Future studies should explore the possibility of the inverted U-shaped dose response curve proposed by Feng et al. (2015).
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Visual attention to the eye region of human faces predicts emotion recognition performance in Huntington's disease
Catarina Kordsachia, Izelle Labuschagne, Julie Stout
Objective: Previous research has shown that the ability to recognize emotions from facial expressions is impaired in Huntington's disease (HD). The aim of this study was to determine differences in visual attention to important parts of human faces in HD participants,

compared to control participants, and to assess the association between visual attention and emotion recognition performance.
Participants and Methods: We recorded eye movements of 25 gene-positive HD participants and 25 age-matched control participants during a face viewing task. The task involved the viewing of pictures depicting human faces with angry, disgusted, fearful, happy, and neutral expressions, and the evaluation of these faces on a valence rating scale. For each face stimulus, we defined two regions of interest (ROIs); an eye-ROI and a nose/mouth-ROI.
Results: We found that the HD group, compared to the control group, spent a lower portion of picture viewing time looking at the ROIs, and made a lower portion of fixations on the ROIs. A hierarchical regression analysis within the HD group showed that visual attention to the eye-ROI, but not the nose/mouth-ROI, explained additional variance in emotion recognition performance on a standard task, compared to an indicator of disease progression.
Conclusions: Considering the special importance of eye-contact in social interactions, our findings could reflect that impaired emotion recognition in HD is associated with a deficit in the social-emotional engagement with other people.
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Visuospatial Functions/Neglect/Agnosia - Poster Session 3 - 08.30 - 10.30		
Number	**Presenter**	**Poster Title**
15	Lisa Arduino	A new interpretative model of neglect dyslexia and its rehabilitative application
16	Kentaro Hiromitsu	Out-of-body experiences following the posterior cingulate lesion
17	Tobias Loetscher	Impaired spatial perception in Cervical Dystonia?
18	Vincenza Montedoro	The development of an integrative visual-robotic diagnosis test for hemi-neglect
19	Elena Olgiati	Dissecting the mechanisms underlying reward effects in visual neglect
20	Radek Ptak	Early event-related activity predicts visual binding errors after bilateral parietal damage
21	Anouk Smits	Impact of lesion aetiology in a stroke and tumour population on the Rey-Osterreith complex figure

A new interpretative model of neglect dyslexia and its rehabilitative application
Lisa S. Arduino, Silvia Primativo, Roberta Daini, Marialuisa Martelli
Abstract: Around 40% of patients suffering from Unilateral Spatial Neglect (USN) also show a reading impairment in single word reading (i.e., Neglect Dyslexia, ND) where left sided letters are omitted or substituted. Recently, we proposed a new dual mechanism model (Martelli, Arduino, Daini, 2011): While omissions are related to a visuo-spatial exploratory disorder, which characterizes USN plus an eye movement disorder (Primativo et al., 2013), substitutions are due to a perceptual integration mechanism not related to USN. As a consequence, a specific training for omission-type ND patients would aim at restoring the oculo-motor scanning and should not improve reading in substitution-type ND. We present two studies. Firstly, we aimed at clarifying the relationship among USN, ND and impaired oculo-motor behaviour. USN patients identified as having impaired eye movement behaviour in scene exploration and saccadic tasks produced left lateralized omission errors in reading words, while USN with a normal eye movement behaviour did not show ND. In a second study, we administered an optokinetic stimulation (OKS) to two patients with both USN and ND, MA and EP, who showed ND mainly characterized by omissions and substitutions, respectively. The two patients presented a dissociation, so that, as expected, MA was positively affected by OKS, while EP was not. Our results confirm a dissociation between the two mechanisms underlying different reading errors in ND patients. Moreover, the large percentage of impaired patients indicates that the oculomotor behaviour requires particular attention during the diagnostic phase in order to program the best rehabilitation strategy.
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Out-of-body experiences following the posterior cingulate lesion
Kentaro Hiromitsu, Chihiro Itoi, Shoko Saito, Ryoji Yamada, Nobusada Shinoura, Akira Midorikawa
Objective: Out-of-body experiences (OBEs) have been defined as those in which an individual seems to view his/her body and the world from a location outside his/her physical body. Previous studies have reported that the temporo-parietal junction (TPJ), which is important for multisensory coding, were closely linked to OBEs. In this study, however, we reported that two patients with the left posterior cingulate lesion showed OBE.
Participants and methods: Case 1 was a 59 year-old, left-handed male suffering from brain tumors located in the left temporal lobe and included the posterior cingulate cortex (PCC). Case 2 was a 48 year-old, right-handed female suffering from brain tumors located in the left medial parietal lobe and the PCC. In order to remove the brain tumors, they underwent awake craniotomy.
Results: Case 1 reported he was located in another place not in the operating room for a few seconds during surgery. After surgery he remembered the sense of OBE vaguely and never felt such a sense since the surgery. Case 2 reported she experienced OBE several times in daily life before surgery. She reported specific explanation regarding OBE by drawing pictures of OBE.
Conclusions: There are two possible explanations on these cases of OBE. One is the fact that the PCC has a neuroanatomical association with TPJ. The other is the experimental evidence that the PCC has a key role in integrating the neural representations of self-location and body ownership (Guterstam *et al*., 2015). Thus, the PCC might be associated with OBE.
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Impaired spatial perception in Cervical Dystonia?
Tobias Loetscher, Emily Rosenich, Rebecca Callahan, Lynley Bradnam
Objective: Cervical Dystonia (CD) is a neurological disorder characterised by involuntary neck muscle contractions that may lead to abnormal head and neck postures. The objective of this study was to investigate the consequences of an abnormal lateral head posture on spatial perception while walking. The hypothesis was that lateral head rotations affect the detection of stimuli placed on the contralateral space in patients with CD.
Participants and Methods: Ten patients with CD and 11 age-matched healthy controls walked a designated circular course in clockwise and anti-clockwise directions (counterbalanced order). While walking, the participants were asked to locate coloured visual targets (100 mm × 100 mm) placed along the walls of the course. There were 20 left-sided and 20 right-sided targets and the dependent measure was a spatial asymmetry score calculated as right-sided minus left-sided target omissions.
Results: The CD patients did not differ from the controls on a group level ($t=0.86$, $p>0.4$). Inspection of the data revealed that one patient with a head rotation towards the left-side failed to detect most right-sided targets (asymmetry score of -13). Bayesian single case statistics confirmed that this asymmetry was significantly different from the controls (Bayesian $p<0.002$).
Conclusions: Most CD patients adequately compensated for their lateral head rotations and did not demonstrate difficulties in attending to the contralateral side while walking. However, one patient showed severe signs of neglect. This finding warrants further investigation into the prevalence of neglect in CD and its implications for function and participation in everyday life.
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The development of an integrative visual-robotic diagnosis test for hemi-neglect
Vincenza Montedoro, Marie Alsamour, Stéphanie Dehem, Maxime Gilliaux, Daniel Galinski, Luisa Schommers, Françoise Coyette, Adrian Ivanoiu, Gaëtan Stoquart, Thierry Lejeune, Martin Edwards
Objective: Hemineglect is a condition where brain-damaged patients are impaired at perceiving and responding to contralesional objects and space. While tests exist to diagnose different forms and severities of hemineglect, these tests are not integrative. The objective of our research is to develop and validate a new integrative visual-robotic diagnosis test for hemineglect. In this poster, we will

present the validation of an integrated ego- and allo-centric diagnosis test.
Participants and Methods: We tested 15 patients (8 hemineglect) on two occasions (with a three-day interval). In the new test, participants had to detect a target randomly presented among distractors, responding by using the REAplan robot end-effector. The targets could be complete or incomplete (missing left- or right-side allocentric features), and targets were presented across the lateral space (egocentric left-to-right). We recorded reaction time, omissions, false positives and impulsivity. We also administered standardised hemineglect tests (e.g., cancellation).
Results: Significant correlations between the new and existing tests demonstrated good validity for the diagnosis of egocentric hemineglect. Intra-class correlation between the results of the two test occasions showed good reliability for the ego- and allo-centric parts of the test.
Conclusions: The integrative visual-robotic diagnosis test showed good validity and reliability for egocentric hemineglect diagnosis. Although there was good reliability for allocentric hemineglect diagnosis, more patients are required for the validity. We end the poster by discussing the addition of an integrated motor-hemineglect test where the patient points to the target using the robot, and kinematic measures are added to the diagnosis profile.
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Dissecting the mechanisms underlying reward effects in visual neglect
Elena Olgiati, David Soto, Paresh Malhotra
Objective: Spatial Neglect (SN) commonly occurs following stroke, and is associated with reduced attention to the contralesion side. One possible route to alleviate SN is via monetary reward (Malhotra et al., 2013) but the precise mechanisms underlying reward's effects have not been determined. We used the classic Landmark paradigm to explore how reward modulates attention.
Participants and Methods: Eight patients with left SN participated. They were asked to state which section of pre-bisected lines appeared shorter (Baseline). In two subsequent sessions, pictures of rewarding (pound coins) and non-rewarding objects (brass buttons) were presented (Task 1) in the middle of the screen before the appearance of each line or (Task 2) above the end of the line. Patients were informed that they would receive a reward for correct responses in rewarded trials.
Results: As previously described, accuracy was lowest for trials with uncued lines pre-bisected towards the right. For these trials, accuracy was higher in Task 1 compared to Baseline, suggesting a possible arousal effect persisting over multiple trials. This was supported by the finding that performance was higher for uncued trials following rewarded trials versus those following non-rewarded trials. Lateralised cues in Task 2 reduced the rightward bias regardless of the cue, with no increased effect of reward.
Conclusion: These results show that stimuli explicitly associated with reward do not redirect spatial attention any more than neutral stimuli, but, when centrally located, appear to boost performance on subsequent trials, suggesting that reward's effects on cancellation tasks in neglect patients are via an increase in generalised arousal.
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Early event-related activity predicts visual binding errors after bilateral parietal damage
Elena Pedrazzini, Julia Fellrath, Raphael Thézé, Radek Ptak
Objective: Perception of coherent visual objects requires the binding of distinct object features (e.g. colour, shape or motion) to a spatial location. Illusory conjunctions (e.g. the confusion between the shape of one stimulus with the colour of another stimulus) are the most dramatic expressions of binding failures in vision. Under brief exposure or when attention is diverted illusory conjunctions may be observed in healthy participants. However, it is unclear whether such failures reflect the impairment of early or late stages of visual processing.
Participant and Methods: We examined the time-course of visual processing using evoked potential measures in a 74-year old woman presenting prominent binding failures following bilateral vascular damage to the posterior parietal cortex. The patient was asked to identify coloured letters briefly flashed to the left and right hemifield, or simultaneously to both hemifields while continuous EEG was registered with a 128-channel system.
Results: Under unilateral presentation the patient adequately identified colour or shape of left and right letters. In contrast, under bilateral presentation she either only identified the right colour-shape combination or made an illusory conjunction between the right shape and left colour. Evoked potential analyses revealed a specific electrophysiological signature of illusory conjunctions starting ~90 ms after stimulus onset over the right frontal cortex.
Conclusions: These findings indicate that binding errors reflect failures of early stages of attentional filtering that rely on the posterior parietal cortex.
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Impact of lesion aetiology in a stroke and tumour population on the Rey-O complex figure
Anouk Smits, Matthijs Beisbroek, Pierre Robe, Martine van Zandvoort
Objective: Visuospatial construction, as tested in the Rey-Osterrieth Complex Figure (ROCF) is composed of a purely constructional component, and visuoperceptive, attentional, and decisionmaking components. A recent study in stroke patients demonstrated discordance in anatomical correlates of the ROCF and Judgment of Line Orientation (JULO). These findings provided new insights in the anatomical correlates of the pure visuoconstructive components of the ROCF and provided evidence for a crucial role of the right inferior and superior parietal, angular and middle occipital gyri in visuoconstruction proper. In the current study, we compared neuroanatomical underpinnings derived from this stroke population to the correlates in a brain tumor population.
Participants and Methods: Lesion-symptom mapping was applied in a cohort of 66 patients with first-ever ischemic stroke and a cohort of 103 glioma patients. We employed the Rey–Osterrieth Complex Figure (ROCF) copy test, the Judgment of Line Orientation (JLO), the Digit Span (WAIS-III) and Letter Fluency. Patients' performance was compared across stroke and tumor controlling for age and educational level. Hemispheric dominance was assessed.
Results: Lesion location associated with the pure visuoconstructive component of the ROCF appeared to be independent of the affected hemisphere in the tumour patients opposed to the clear right hemisphere dominance in the stroke population. Further lesion analyses suggest cautious generalisation of neuroanatomical correlates from one aetiology to the other.
Conclusion: The discordance between the findings within the stroke and the tumour population objectified in this study demonstrates the value of including more than one aetiology.
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Poster Session 3: Thursday 7th July 2016 - 08.30 - 10.30

Cognitive Neuroscience - Poster Session 3 - 08.30 - 10.30		
Number	**Presenter**	**Poster Title**
22	Michela Balconi	Competition in the brain: social, cognitive and personality effects
23	Francesca Meneghello	Conversation analysis in the memory clinic- Distinguishing dementia from functional memory disorder
24	Isabel Cando	Cognitive development of children or rural highlands in Chimborazo Ecuador: Association with stunting
25	Mélissa Chauret	Fear circuitry function through adolescence: influence of cerebral maturation and sex on emotional regulation
26	Jeanyung Chey	Opposing effects of stress on model-based choice behavior and its neural correlates
27	YanHong Dong	Cognitive trajectory and predictors for cognitive decline in Singaporean older adults with vascular cognitive impairment
28	Amy Peters	Acute stress-induced cortisol elevations attenuate engagement of fronto-striatal circuitry during emotion processing in

		depression
29	Maneet Saini	Emergence of cognitive, language and motor impairment associated with the mutation of the FOXP2 gene in a preverbal infant
30	Irene Venturella	The role of emotion on body ownership and the rubber hand illusion: an EEG-NIRS study

Competition in the brain. Social, cognitive and personality effects
Michela Balconi, Maria Elide Vanutelli
Objective: In the present study the social ranking perception in competition was explored. Brain response (alpha band oscillations, EEG; hemodynamic activity, O2Hb) as well as self-perception of social ranking, cognitive performance, and personality trait (Behavioral Activation System, BAS,) were considered during a competition.
Participants and methods: Subjects (30) were required to develop a strategy to obtain a better outcomes than a competitor. A pre-feedback (without a specific feedback on the performance) and a post-feedback condition (which reinforced the improved performance) was provided.
Results. It was found that higher BAS participants responded in greater measure to perceived higher cognitive performance (post-feedback condition), with increased prefrontal left activity, perception of higher ranking and a better real performance (reduced RTs).
Conclusions: These results were explained in term of increased sense of self-efficacy and social position, probably based on higher-BAS sensitivity to reinforcing condition. In addition, the hemispheric effect in favor to the left side characterized the competitive behavior, showing an imbalance for high-BAS in comparison with low-BAS in the case of a rewarding (post-feedback) context. Therefore, the present results confirmed the significance of BAS in modulating brain responsiveness, self-perceived social position and real performance during an inter-personal competitive action which is considered highly relevant for social status.
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Conversation analysis in the Memory Clinic- Distinguishing dementia from Functional memory disorder
Daniel Blackburn, Chris Elsey, Kirsty Harkness, Sarah Wakefield, Paul Drew, Markus Reuber, Annalena Venneri
Objective: Conversation Analysis (CA) can help with the differential diagnosis of seizure disorders. We investigated if CA could be used in the memory clinic to distinguish neurodegenerative (NDD) from functional memory disorders (FMD). Patients without dementia are increasingly seen in secondary care memory clinics and better screening tools are required
Participants and Methods: We recruited consecutive, patients newly referred to the Neurology-led memory Clinic. Consultations were video & audio recorded. All participants underwent detailed Neuropsychology testing and MRI.
Results: 111 patients of 178 approached were recruited (20 ND, 24 FMD, 87 other). We identified profiles of 14 interactional features that can distinguish NDD from FMD consultations based on encounters with 15 patients with NDD and 15 with FMD. Features of NDD included an inability to answer compound questions fully, inability to give detailed examples of memory failures, shorter length of turn and reduced complexity of replies. Prospective analysis of an additional 10 encounters proved that Conversation Analysts could use these features to predict the diagnoses of FMD and ND with high sensitivity and specificity.
Conclusions: Simple differences in the communication behaviour of patients can help to distinguish between ND and FMD, suggesting that a targeted observation of interactional features could improve screening for ND in primary or secondary or care settings.
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Cognitive Development in Children of Rural Highlands of Chimborazo, Ecuador: Association with Stunting
Isabel Cando, Alicia Díaz-Silva, Marcela Guerendiain
Objective: To analyse the relationship between cognitive development and stunting in schoolchildren of rural highlands of Chimborazo.
Participants and methods: This work included 39 children participant in the EVANES study, aged 7-12 years, from a rural school of Chimborazo, Ecuador. The Wechsler Intelligence Scale for Children four edition (WISC IV) was used to evaluate verbal comprehension (VC), working memory (WM), perceptual reasoning (PR), processing speed (PS) and full-scale intelligence quotient (FSIQ). Intelligence scores were classified as follows: extremely low (<70), borderline (70-79), low average (80-89), average (90-109), high average (>110) and superior (>120). The nutritional status was defined according to standard deviation score of height using the World Health Organization Growth Reference, 2007. Children were divided in stunting (height-for-age)
Results: The score means of VC, WM, PR, PS and FSIQ were 75.0 ± 12.0, 86.0 ± 13.0, 80.0 ± 13.0, 85.0 ± 13.0 and 76.0 ± 11.0, respectively. 30.76% of schoolchildren presented extremely low score in VC, 28.20% in PR and 25.64% in FSIQ. Only 35.89 (VC), 48.71 (PR), 58.96 (WM), 69.22 (PS), 41.02 (FSIQ) of children had an average performance. Those with stunting presented lower verbal comprehension (p=0.010) and full-scale intelligence quotient (p=0.013) than control group, independently of age, weight, body mass index, and mother and father education.
Conclusions: Our findings suggest that stunting condition in children at school age may affect their cognitive development, especially the mental functions in the anterior cortex of the brain.
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Fear circuitry function through adolescence: influence of cerebral maturation and sex on emotional regulation
Mélissa Chauret, Valérie La Buissonnière-Ariza, Marouane Nassim, Daniel S. Pine, Françoise S. Maheu
Objective: This study examines the neural fear circuitry maturation and the influence of sex on emotional regulation during threat processing.
Participants and Methods: Fifty-three healthy adolescents (10-17 years old) were recruited. Subjective fear ratings and skin conductance responses (SCR) were assessed during validated fMRI fear conditioning and extinction tasks presenting two female faces (CS+ vs. CS-).
Results: While psychophysiological measures showed differential fear conditioning in all participants, fMRI data revealed hyperactivity in left DLPFC and bilateral OFC in all boys compared to girls, and younger boys showed hyperactivity in right OFC and left sgACC, whereas younger girls showed deactivations (CS->CS+). During extinction, differential psychophysiological findings remained significant in boys on subjective fear ratings and in girls on SCR. Moreover, early adolescence was associated to extinction resistance on SCR, left PFC and left amygdala (trend level), and in left OFC in younger boys. Finally, girls showed left DLPFC deactivation during extinction.
Conclusions: These data suggest that immaturity of the fear circuit may be related to risk markers of anxiety as an enhance top-down regulation is required in younger participants during conditioning, and as they failed to efficiently regulate SCR and amygdala hyperactivity during extinction. Furthermore, fMRI fear-generalization patterns of girls during conditioning, besides their extinction resistance of SCR and failure to recruit the DLPFC, are congruent with our previous study demonstrating how faces of one's own sex group can trigger stronger fear responses. Thereof, boys' DLPFC and OFC hyperactivity during conditioning may suggest an attentional bias related to female faces coding.
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Opposing effects of stress on model-based choice behavior and its neural correlates
Jeanyung Chey, Heyeon Park, Daeyeol Lee, Nathaniel Daw
Objective: Reward-seeking behaviors were regarded to be controlled by at least two partially separate neuroanatomical systems, habit and goal-directed systems. Previous studies have reported that stress shifts behavioral control by promoting habits while decreasing goal-directed behaviors. However, the effect of stress on reward-seeking behavior might be bidirectional according to its intensity, considering the observations that too much stress impairs performance in a variety of task, but it can also improve

cognitive performance when a certain level of arousal is beneficial, as often referred to as the Yerkes-Dodson law (inverted U).
Participants and Methods: Here, we investigated whether and how the opposing effect of stress manifest as a potentially shifting balance between the model-free and model-based RL, using computational models and functional magnetic resonance imaging. Participants were randomly assigned to one of the three conditions, no-stress, single-stress treatment, and double-stress treatment before performing a two-stage Markov decision-making task in which the reward probabilities for the decision making in the second stage underwent reversals without notice.
Results: As expected, model-based performance using the model of task structure was increased in the single-stress-treatment, while it was decreased in the double-stress treatment. These results were consistent with an inverted U shape of the BOLD signals in the ventromedial prefrontal cortex during decision-making.
Conclusion: Our findings provide behavioral and neural evidences for the inverted U effect of stress on model-based decision-making. And we suggested that the arbitration between habit versus goal-directed controllers might be modulated dependent on the level of ongoing stress experienced by decision-makers.
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Cognitive trajectory and predictors for cognitive decline in Singaporean older Adults with vascular cognitive impairment
YanHong Dong, Jing Xu, Saima Hilal, Mohammed Kamran Ikram, Narayanaswamy Venketasubramanian, Christopher Li-Hsian Chen
Objective: The cognitive trajectory of vascular cognitive impairment (VCI) and its underlying mechanism remains unclear. We aim to characterise cognitive trajectory of Singaporean patients with VCI relative to controls and non-vascular cognitive impairment. We explore markers for vascular process (e.g., infarcts, white matter lesions, microbleeds, intracranial stenosis) and neurodegenerative process (hippocampal atrophy, APOE-4) in predicting cognitive decline.
Participants and Methods: Participants (≥50 years old) diagnosed with no cognitive impairment (NCI), VCI no dementia (VCIND) and non-vascular CIND, Alzheimer's disease (AD) with and without cerebrovascular disease (CeVD), and vascular dementia (VaD) received NINDS–Canadian Stroke Network harmonization neuropsychological battery at baseline, year 1 and 2. Linear mixed models were used to examine factors predicting cognitive decline.
Results: 97 NCI, 116 CIND, 67 VCIND, 36 VaD, 140 AD participants were recruited. The neuropsychological performance of NCI and CIND participants were either stable or improved, while participants with VCIND showed significant decline in global cognition, visuomotor speed and visuoconstruction. VaD participants' neuropsychological performance were stable. However, participants with AD with and without CeVD showed significant decline in global cognition and multiple domains. Among the whole group, participants with infarcts or moderate-severe medial temporal lobe atrophy had poorer global cognition at baseline (P=0.03, P<0.001 respectively). On follow up, cerebral microbleeds predicted more decline in global cognition (P=0.04), while moderate-severe medial temporal lobe atrophy predicted more decline in global cognition (P<0.001) and multiple domains.
Conclusions: Cognitive trajectory of VCI differs from non-vascular cognitive impairment. Both neurodegenerative and vascular processes seem to account for cognitive decline.
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Acute stress-induced cortisol elevations attenuate engagement of frontostriatal circuitry during emotion processing in depression
Amy Peters, Anna Van Meter, Emily Briceno, Anne Weldon, Michelle Kassell, Patrick Pruitt, Aaron Verderman, Jon-Kar Zubieta, Melvin McInnis, Sara Weisenbach, Scott Langenecker
Objective: Depression is associated with dysregulated HPA-axis function and disrupted emotion processing. The neural networks involved in attenuation of HPA-axis reactivity share function with the circuitry involved in perception and modulation of emotion, however direct links between these systems is understudied. The present study investigated whether cortisol activity prior to an fMRI scan was related to neural processing of emotional information in depressed subjects.
Participants and Methods: Forty-one adults (M = 40.33, SD = 15.57) with major depression (MDD; n = 29) or bipolar disorder (BP; n = 12) and 23 healthy control comparisons provided salivary cortisol samples prior to completing a facial emotion perception test during 3-tesla fMRI.
Results: Pre-scan cortisol was associated with engagement of the dorsal anterior cingulate (dACC), inferior parietal lobule, insula, putamen, precuneus, middle, frontal and postcentral gyri, posterior cingulate, and inferior temporal gyrus during emotion processing. Depression moderated this effect; in depressed subjects pre-scan cortisol was associated with attenuated activation of the insula, postcentral gyrus, precuneus, and putamen for fearful faces and the medial frontal gyrus for angry faces. Hypo-activity among MDD/BP participants was also observed for facial recognition in the dACC, putamen, middle temporal gyrus, precuneus, and caudate.
Conclusions: Across all subjects, cortisol increased activation in several regions involved in the perception and control of emotion. However, cortisol responsivity was associated with deactivation of several of these regions in depression, suggesting that HPA-axis activity in depression may interfere with the potentially adaptive recruitment of regions supporting emotion processing.
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Emergence of cognitive, language and motor impairment associated with the mutation of the FOXP2 gene in a preverbal infant
Maneet Saini, Rachael Elward, Faraneh Vargha-Khadem
Objective: Our previous studies of the three-generational KE pedigree revealed the phenotype of verbal and orofacial dyspraxia in the children and adult members affected by a point mutation of the FOXP2 gene. In vertebrates, Foxp2 expression occurs early during embryological development and involves the setting up of the motor circuitry that eventually serves articulate speech in humans, ultrasonic calls in rodents, and song learning in birds. Here, we report longitudinal evaluations in an affected infant and his unaffected twin from the fourth generation of the KE family to determine the effects of the FOXP2 mutation on the early development of cognitive, language and motor abilities. Performance of the affected infant was compared to that of his unaffected twin, and a group of healthy controls (N = 12). The Bayley Scales of Infant and Toddler Development was administered at 6 months and 12 months. Results indicated that the affected infant obtained much lower standard scores compared to his unaffected twin, and significantly lower scores compared to the group of healthy controls in the domains of cognition, receptive and expressive language, and gross and fine motor skills at both 6 and 12 months (all p<0.001).
These findings suggest that in contrast to the selective phenotype of verbal and orofacial dyspraxia in the affected KE children and adults, the FOXP2 mutation initially presents with a broad phenotype during the early, pre-linguistic stages of infancy, one that encompasses all aspects of sensorimotor and cognitive development.
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The role of emotion on body ownership and Rubber Hand Illusion: an EEG-NIRS study
Irene Venturella, Valeria Milone, Davide Crivelli, Michela Balconi,
Objective: Rubber hand illusion (RHI) is a well-known phenomenon where the wrong attribution of tactile sensations to a rubber hand placed in front of a subject lead to the embodiment of such external object in the subject's body schema. However, the depth of such integration within the body schema and its affective undertones are still understudied. In order to investigate the extent to which an embodied rubber hand can be processed as part of one's own body, we implemented the classic RHI paradigm with an additional affective stimulation by presenting an adverse stimulus next to the rubber hand.
Participants and methods: The illusion was induced in healthy subjects by repeatedly and simultaneously stimulating with two brushes the real hidden hand and the rubber hand for three minutes. The study included three experimental stimulation sessions. Half of the subjects was presented with the adverse stimulus after the first illusion-inducing stimulation, while the other half experienced the adverse condition after the second stimulation session, to control for potential habituation effects.

Results: During the entire study we also recorded cortical activity by EEG and fNIRS (functional Near-Infrared Spectroscopy). EEG data showed the involvement of temporal-parietal areas during RHI after the emotional stimulation, as marked by an increase of delta power. fNIRS hemodynamic data pointed at the involvement of left frontal areas during adverse condition.
Conclusions: Evidences suggest that exposure to an adverse stimulus - though involving an embodied external object - might influence subsequent re-embodiment and body ownership processes and its cortical correlates.
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Imaging (Functional) - Poster Session 3 - 08.30 - 10.30		
Number	**Presenter**	**Poster Title**
33	Marta Aliño Costa	fMRI results using auditory emotional paradigm in different mental disorders: a systematic review
34	Fumiko Anzaki	Brain activities of a Japanese man with developmental stuttering in hearing and repetition tasks measured using functional near-infrared spectroscopy
35	Scott Langenecker	Cognitive control network connectivity and cognitive control task activation predict relapse of depression in young adults
36	Alex Marsh	Investigation of visuospatial memory lateralisation in temporal lobe epilepsy and health participants
37	Eliane Miotto	Verbal episodic memory neural correlates in patients with left frontal stroke lesions
38	Jessica Vicentini	Worse cognitive performance is associated to default mode network abnormalities in subacute ischemic stroke

fMRI results using auditory emotional paradigm in different mental disorders: a systematic review
Regis Villegas, Marien Gadea Domenech, Mara Segura Serralta, Marta Aliño Costa, Julio Sanjuan Arias
Objective: The literature shows that an emotional auditory paradigm to look for brain activation when listening to stimulus emotionally relevant for the subject. This has been done particularly in psychosis but also in other mental disorders. As far as we know there is not a review looking at the differences in such neural activation among different psychopathological disorders. The main objective of this study was to make a systematic review about this issue.
Methods: A systematic review was done based on articles published in PubMed and ISI Web of Knowledge from January 1990 to January 2016, following the PRISMA guidelines and combining the use of electronic and manual search methods. Data were extracted upon pre-defined requested items and were analysed using several clinical characteristics. We used as key words: emotional, auditory, fMRI, paradigm, mental disorder.
Results: From the screening of 545 studies just 13 studies met the inclusion criteria and were included in our review. We found some degree of limbic over activation and less functional lateralization and connectivity in psychosis. Regarding mood disorders, we found under-activation and altered patterns in depression, and bilateral over-activation with less connectivity in anxiety disorders.
Conclusions. The use of an emotional auditory paradigm in fMRI, suggests different patterns of brain activation among patients with psychosis, depression and anxiety. Nevertheless, the use of different fMRI methodologies make difficult to be conclusive about this issue. New studies using standard methodologies in different mental disorders may confirm this hypothesis
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Brain activities of a Japanese man with developmental stuttering in hearing and repetition tasks measured using functional near-infrared spectroscopy
Fumiko Anzaki, Sayoko Yamamoto, Masao Inoue
Objectives: Previous imaging studies in adults with developmental stuttering (ADS) found left hemisphere white matter deficiencies and reversed right-left asymmetries compared to fluent controls (FC) (Chang, 2008). We investigated each hemisphere processing during the auditory task via either the right or left ear using functional near-infrared spectroscopy.
Participants: The ADS was a right-handed, moderately stuttering 38-year old man, and ten FC persons.
Methods: Four audio speech files, each comprising different Japanese speech sounds and white noise (WN), were recorded. Ten seconds of WN was interposed between each 30 seconds of recorded speech. In the listening task, participants were asked to listen to clearly audible speech via first their right and then their left ears. In the repetition task, they were asked to repeat clearly the audible speech heard via the right ear, continuously via the left ear. We measured the relative changes in oxyhemoglobin during the task by FOIRE - 3000 (Shimadzu Corporation).
Results: In the listening task, for ADS, brain activities were not exhibited in the bilateral superior temporal gyrus via each ear. In the repetition task, for ADS, brain activities were not exhibited in the bilateral temporal area via the right ear, but were exhibited in the left temporal area via the left ear. For FC, brain activities were exhibited in the bilateral temporal area via each ear. **Conclusions:** For ADS, the auditory information did not reach the left auditory temporal area via the right ear. It is possible that ADS has different auditory pathways for each ear.
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Cognitive Control Network Connectivity and Cognitive Control Task Activation Predict Relapse of Depression in Young Adults
Scott Langenecker, Jon Stange, Lisanne Jenkins, Alessandra Passarotti:
Overview: Regulation capacity is thought to reflect a general capability that can influence both cognitive and emotional flexibility. This may lead to greater adaptation in the face of adversity.
Participants and Methods: In the present study, we compared 52 individuals between ages of 18 and 23 with a history of major depressive disorder (remitted, rMDD) to 45 individuals with no personal or family history of psychiatric illness, matched on age, sex, and IQ.
Results: Those with rMDD did not differ from controls in performance on a Parametric Go/No-go test, but they did exhibit decreased activation in bilateral frontal regions during correct rejections of prepotent responses. Three bilateral seeds in the Cognitive Control network were used in resting state fMRI analyses to define the network. Within this network, rMDD showed decreased mean connectivity. Furthermore, those who relapsed within a subsequent year of follow-up showed the greatest within network decreases in connectivity of the entire CCN to left and right dorso-lateral prefrontal cortex (DLPFC) seeds (ps = 01 and .04 respectively). Those who had a relapse of illness also exhibited decreased activation in right DLPFC compared to those who remained resilient and to HC (p< .005) during correct rejections.
Conclusions: Decreased function and network connectivity of CCN plays a critical role in the individual differences in risk for MDD and in course of illness over one year. Identification of early relapse predictors in MDD could change treatment and management of MDD in early adulthood, with the potential to reduce morbidity and mortality.
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Investigation of visuospatial memory lateralisation in temporal lobe epilepsy and health participants
Alex Marsh, Priscila Rojas, Kimon Butzbach, Kit Pleydell-Pearce) Ingram Wright, Orlagh Keeting, Ellie Brooks
Objective: Determining the functional lateralisation of language and memory function is important for predicting cognitive outcome following epilepsy surgery. Successful fmri paradigms for assessing memory lateralisation have largely focussed on verbal memory, which reliably recruits left mesial temporal structures in healthy individuals. The development of visuospatial paradigms has proved more challenging with left hemisphere processing biases and verbalisation strategies restricting the development of a task to selectively recruit right mesial temporal structures. The current task

aimed to determine the merit of a newly-designed visuospatial paradigm in maximising BOLD asymmetry to the right by placing a preferential load on spatial memory.
Participants and Method: Twenty healthy controls and 8 patients with temporal lobe epilepsy underwent a forced-choice visuospatial recognition task that tested memory for orientation of a novel stimulus, whilst undergoing fMRI. Behavioural data was analysed to determine encoding success (hits) or failure (misses) to support analysis of fMRI data. Region of interest analysis was undertaken for encoding of visual scenes (Hits vs. Misses) for an anatomically defined hippocampal region.
Results: Behavioural results show modest levels of recognition accuracy for visual scenes, therefore adequate opportunity for analysis of hits versus misses in an event related analysis. ROI analysis demonstrated recruitment of right hippocampus during successful encoding of visuospatial scenes in healthy controls. Selected patient data is presented to illustrate the utility of this paradigm in predicting post-operative memory outcome.
Conclusions: This paradigm is suitable for determination of right hippocampal and post-operative memory outcome in epilepsy surgery.
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Verbal Episodic Memory Neural Correlates in Patients with Left Frontal Stroke Lesions
Eliane Miotto, Alana Batista, Paulo Bazan, Marcia Castro, Ana Gurgel, Maria da Graça Martin, Eberval Figueiredo, Edson Amaro Jr, Manoel Teixeira, Adriana Conforto
Objective: Memory impairment after ischemic stroke can produce consequences in functional recovery and long-term outcome. Although there are case and group studies related to memory impairment in this population, no study has investigated the neural correlates of verbal episodic memory (EM) in patients with left frontal stroke, a crucial region for encoding in EM. The aim of the current study was to investigate the brain correlates of verbal EM in a sample of this population using fMRI.
Participants and Methods: Patients with left frontal ischemic stroke lesions and healthy control subjects were scanned during the encoding of word lists. We used a 3 T MR system (Philips Achieva) and FSL package (v 5.0.1, FMRIB) to analyze the fMRI data. Whole brain group analyses were performed and fMRI activation maps were thresholded at Z-voxel>2.3 and p-value < 0.05 (cluster corrected).
Results: Stroke patients showed a significantly poorer performance during word list recall in relation to controls (p=0.043). In addition, there was a significant difference in activation between the two groups involving the left middle temporal gyrus and inferior parietal region.
Conclusions: Verbal EM impairment showed by the patients following left frontal ischemic stroke was associated to increased activation in spared brain regions in the left hemisphere. Even though their performance was significantly worse than that of the healthy controls, the recruitment of regions not affected by stroke in the same hemisphere could be explained as a possible compensation mechanism
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Worse cognitive performance is associated to Default Mode Network abnormalities in subacute ischemic stroke
Jessica Vicentini, Brunno Campos, Sara Almeida, Lenise Valler, Li Min Li
Objective: One-third of patients that suffered a stroke will face cognitive decline, which negatively impacts outcome. Resting-state functional connectivity is defined as temporal correlation between spatially remote regions of brain. The Default Mode Network (DMN) is one of most prominent resting-state functional network and it has been associated to cognitive and emotional processing. We aimed to investigate whether resting state functional connectivity of DMN was associated to cognitive performance in stroke patients.
Participants and Methods: Thirty-four subacute (less than one month from the ictus) stroke patients aged between 45-80 who had experienced their first-ever ischemia and without previous neurological history were submitted to: 1) neuropsychological evaluation through Montreal Cognitive Assessment (MoCA) and 2) functional Magnetic Resonance Imaging (fMRI) acquisition using a 3T scanner (Philips Achieva®). The image processing were based on realignment, segmentation, normalization (MNI-152) and smoothing, using UF2C (User Friendly Functional Connectivity) toolbox. One-way analysis of variance was performed in SPM12 for MATLAB, adjusting for gender, age, educational level and Fazekas score and following the parameters of p<0.001 uncorrected and cluster size with at least 50 voxels.
Results: We found a negative correlation between MoCA scores and DMN functional connectivity in left middle frontal gyrus and left inferior parietal gyrus.
Conclusion: Abnormal DMN functional connectivity was associated with worse cognitive performance following stroke in subacute stage. Our findings provides new insights into the underlying mechanisms of post stroke cognitive performance.
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Imaging (Structural) - Poster Session 3 - 08.30 - 10.30		
Number	**Presenter**	**Poster Title**
39	Francisco De Santiago Requejo	The long way from connectomics to cognition: Can we trust connectomics metrics based on tractography?
40	Flavio Dell'Acqua	Scaling-up human brain networks analysis in large tractography datasets with MegaTrack
41	E Wallace	Diffusion tensor imaging changes following adult traumatic brain injury: A meta-analysis

The long way from connectomics to cognition: can we trust connectomics metrics based on tractography?
Francisco De Santiago Requejo, Luis Miguel Lacerda, Marco Catani, Flavio Dell'Acqua
Introduction: In contemporary neuroscience connectomes are seen as the ultimate approach to understanding human cognition. However, connectomics metrics can be highly dependent on several parameters, including processing parameters and quality of data. In this study we used tractography to evaluate how the use of anatomical priors and filtering affects final connectomics results in the same dataset.
Methods: A single diffusion weighted imaging (DWI) synthetic dataset from the 2015 ISMRM Tractography Challenge was used [2]. Twenty-five white matter manually dissected bundles were first used to create a ground truth connectome [1]. The generated dataset was then used to evaluate tractography reconstructions and study the effect of different levels of processing and anatomical filtering applied before extracting connectomics metrics. Results were directly compared to the ground truth scenario.
Results: Clustering coefficient (C), characteristic path length (L) and small-worldness indexes (S) are summarised in the following table:
Ground_truth: (C)5.77 (L)0.81 (S)7.15
No_processing: (C)1.75 (L)1.03 (S)1.69
Anatomical_Priors: (C)1.88 (L)0.99 (S)1.89
Anatomical_Priors +Masking: (C)2.12 (L)0.94 (S)2.00
All methods applied show a substantial reduction in small-worldness, suggesting an increased number of random connections and apparent loss of efficiency as shown by the increased path length.
Conclusion: Existing processing and filtering techniques applied to connectomics may not be able to characterise the real anatomical complexity of white matter tracts. If careful processing of tractography is not ensured, extracted graph theory measures cannot be useful to accurately characterize anatomical networks.
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Scaling-up human brain networks analysis in large tractography datasets with MegaTrack
Flavio Dell'Acqua, Luis Lacerda, Rachel Barrett, Pedro Luque Laguna, Lucio D'Anna, Marco Catani
Objectives: Diffusion tractography is widely used for reconstructing white matter tracts in the living human brain and to correlate network anatomy with cognition and behaviour. Studying brain networks in large datasets could be key to identify mechanisms of resilience and vulnerability to brain disorders in the general population. However,

analysis of large datasets poses great computational challenges and often scientists opt for automated pipelines. Manual “dissections” can offer better results in terms of anatomical accuracy but they are also time consuming thus making their application to large-scale datasets difficult. Here we propose a new approach that permits fast and accurate ‘manual dissections’ in large-scale datasets.
Methods: MegaTrack is a pipeline that combines and remap in a common reference anatomical space streamlines generated from all individual subjects into a single "mega" tractography dataset. Once generated this dataset allows the simultaneous dissection of white matter tracts for all subjects. Here we tested MegaTrack on 25 healthy controls and 25 patients with limb-onset Motor Neuron Disease (age 51.7±10.5). Manual dissections of the cortico-spinal tract were performed in each individual dataset and in the MegaTrack dataset compiled with both controls and patients and results compared.
Results: Dissections of the 50 datasets completed in approximatively 30 minutes with MegaTrack while individual manual dissections required multiple days. Statistically significant differences in fractional anisotropy between controls and patients were observed for the CST using MegaTrack ($p<0.0003$) and individual manual dissections ($p<0.0003$).
Conclusion: MegaTrack is a fast and accurate approach for group comparisons and analysis of large tractography datasets.
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Diffusion tensor imaging changes following adult traumatic brain injury: A meta-analysis
E Wallace, J Mathias, L Ward
Objective: Diffusion tensor imaging (DTI) is used to identify white matter changes following traumatic brain injury (TBI) by measuring the direction (fractional anisotropy, FA) and rate (mean diffusivity/apparent diffusion coefficient, MD/ADC) of diffusion of water molecules within different regions of the brain. Diffusion is normally constrained by the internal organisation of the white matter, resulting in high FA and low MD/ADC; but this may be altered following TBI (lower FA, higher MD/ADC). However, the location, extent, and timing of these changes has yet to be determined. A meta-analysis was therefore conducted to document the changes in DTI that occur following adult TBI.
Methods: A comprehensive search of the literature identified 60 studies that compared the FA and MD/ADC data from TBI and control groups (aged ≥ 18 years). DTI performed in the acute (< 1 week) and post-acute (> 1 week) periods were examined separately, and the impact of injury severity was additionally investigated.
Results: When TBI and control groups were compared, significantly lower FA values - equating to moderate to very-large effects - were observed in 52% and 69% of all brain regions when DTI was performed in the acute and post-acute periods, respectively. Acutely, MD/ADC was significantly higher in 41% of regions and, post-acutely, 66%. Significantly lower FA values were seen following moderate-severe TBI than after mild TBI.
Conclusions: Overall, white matter changes were evident in many brain regions, suggesting widespread damage. However, some findings remain tentative because they were based on single studies.
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Poster Session 3: Thursday 7th July 2016 - 08.30 - 10.30

Executive Functions/Frontal Lobes - Poster Session 3: 08.30 - 10.30		
Number	**Presenter**	**Poster Title**
42	Omar Alhassoon	Inhibitory control in alcohol use disorder: Implications for cognitive rehabilitation
43	Lauren Bolden	Cortical excitability is related to attention, executive function, and mood in healthy adults
44	Maraike Coenen	Cognitive problems and mood in children with primary and secondary dystonia
45	Francesca Eleuteri	Effects of tobacco withdrawal on executive functions
46	Zahra Farahmand	Facial emotion recognition and its relationship with executive functions in bipolar I patients and healthy controls
(47)	Anders Gade	PRESENTATION WITHDRAWN: Switch if you can: A comparison of phonemic, semantic and alternating fluency, and fluency switching, in pre-manifest and manifest Huntington disease.
48	Samara Hussain	Bilingual advantage: Language proficiencies and inhibitory control in real-life like environment using E-prime
49	Tiffany Ip	Dissecting the role of the left middle frontal gyrus in Chinese reading: How important are the executive control processes?
50	Justin Miller	Dissociation of executive and attentional elements of the digit span task in a population of older adults: A Latent class analysis
51	FA Jonker	Graph theoretical approach: the bridge between cognition and behavior?
52	Anthony Martyr	Assessing inhibitory control in early-stage dementia and Parkinson's disease using the Hayling Test
53	Rui Mateus Joaquim	Deficits of operating memory and support of attention in teenagers with cleft palate
54	Chiharu Niki	Change of performance of Iowa gambling task (IGT) after brain damage: comparison pre and post operation in patients with glioma
55	Graham Pluck	Frontal lobe contributions to academic achievement of university students
56	Graham Pluck	Preserved executive planning ability in ‘at-risk' adolescents living in foster care homes
57	Marcos Rios-Lago	Dissociations after psychosurgery in obsessive-compulsive disorder: A case-controls design
58	Jaan Tulviste	TMS over the DLPFC induced changes in the selection bias in a non-veridical decision making task.
59	Francesco Vergani	The pre-SMA is a major hub for higher cognitive functions
60	Kim Verweij	Neuroanatomical correlates in the Stroop interference condition: a systematic review
61	Marta Witkowska	Executive control of hypertension patients - an fMRI study

Inhibitory control in alcohol use disorder: Implications for cognitive rehabilitation
Omar Alhassoon, Rick Stephan, Kenneth Allen, Scott Wollman, Matthew Hall, Christine Kimmel, William Thomas, Julia Gamboa, Mark Stern, Celina Sari, Constance Dalenberg, Scott Sorg, Igor Grant
Objective: Cognitive rehabilitation in alcohol use disorder treatment rests on a more nuanced understanding of role inhibitory control and its subcomponents. This study examined the effects of alcohol on the individual subcomponents of inhibition in recently detoxified participants.
Method: Investigators searched, coded, and calculated effect sizes of impairments demonstrated in a broad range of neuropsychological tests for executive functioning. A total of 77 studies were selected covering 48 years of research with a sample size of 5,196. Inhibitory control was examined through meta-analyzing motoric, decisional, and cognitive tests of inhibition and impulsivity. For example, Go/No Go False Alarm was included under motoric inhibition, the Iowa Gambling task was considered decisional inhibition, and the Stroop Color-Word Test was classified as a cognitive inhibition task.
Results: Decisional inhibition appeared to have the largest effect size ($g = 0.817$), cognitive inhibition was moderate ($g = 0.670$) while motor had a small effect size ($g = 0.409$). The Hayling Test, Wisconsin Card Sorting Test, and Iowa Gambling Task were the measures most sensitive for alcohol effects.
Conclusion: Inhibition and Self-Regulation, decisional and cognitive inhibitory control more than motoric, are significantly affected by alcohol abuse. Cognitive remediation targeting these precise deficits might increase the related functions mediating the ability to moderate or abstain from alcohol, and so lead to improved treatment results.

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Cortical Excitability is related to Attention, Executive Function, and Mood in Healthy Adults
Lauren Bolden, Joseph Griffis, Sandipan Pati, Jerzy Szaflarski
Objective: Evidence from clinical populations with hyperexcitability, such as epilepsy and ADHD, suggests a relationship between cortical excitability and cognitive performance, particularly in domains maintained by the frontal lobes (e.g. attention and executive function). These patient populations also demonstrate high comorbidity of mood disorders, suggesting a possible relationship between cortical excitability and mood. It is unclear, however, whether these relationships exist amongst healthy individuals. Therefore, the aim of this study was to investigate the relationship between cortical excitability and both cognitive functioning and mood in healthy adults.
Participants and Methods: Single-pulse and paired-pulse TMS was applied to 23 healthy adults to measure cortical excitability and long-interval intracortical inhibition (LICI). A neuropsychological battery was administered to assess aspects of attention (Digit Span Forwards; Digit Span Backwards; Trails A; Flanker), executive function (Trails B; Stroop Color and Word Test; WCST), and mood (POMS).
Results: Two separate between-subjects MANOVAs revealed that participants with primarily excitatory responses to the LICI paradigm performed significantly worse than participants with primarily inhibitory responses on both a composite measure of attention (p = 0.002) and executive function (p = 0.034). These participants also demonstrated significantly more negative mood states than the participants with inhibitory responses (p = 0.017).
Conclusions: Cortical hyperexcitability, and specifically $GABA_B$ network dysfunction, is associated with poorer attention, executive functioning, and mood in healthy adults. These findings indicate that modulating cortical excitability may affect cognition and mood in healthy adults, and serve as a physiological basis for treatment development in these areas via neuromodulatory interventions.
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Cognitive problems and mood in children with primary and secondary dystonia
Maraike Coenen, Hendriekje Eggink, Wencke Veenstra, Marina Tijssen, Jacoba Spikman
Objective: Little is known about cognition and mood in children with dystonia, whereas in adults cognitive deficits as well as depression and anxiety are found. Because dystonia is related to basal ganglia dysfunction, as part of prefrontal-subcortical networks, deficits in cognitive functions mediated by these networks (i.e. attention, memory, executive function and social cognition) can be expected. The aim of our study is to test for differences in cognition and mood between A) dystonic and healthy children and B) children with primary and secondary dystonia.
Participants and Methods: We assessed executive functions, emotion recognition, verbal memory, attention and mood problems in twenty-one dystonic children (14 boys, mean age 11y8m, range 5y9m - 17y8m, 11 primary dystonia) and age-matched healthy peers (7 boys, mean age 12y4m, range 6y6m-17y8m). Global Clinical Impression was used to control for motor impairment severity.
Results: Attention ($p<.001$) was impaired in the patients, but otherwise no differences between patients and controls were found, nor between the two patient groups. Motor impairment severity was unrelated to test performance. 24%-38% of our patients had borderline or clinical scores for respectively anxiety and depression.
Conclusions: Our pediatric dystonia patients showed attention deficits, confirming results found in adults. These deficits are probably related to the dysfunction in the prefrontal-subcortical networks. Other cognitive functions relying on these networks, were not impaired, indicating that patients are probably growing into their deficit. Mood problems were unrelated to the classification of dystonia. A bigger sample size is needed to replicate and clarify our findings.
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Effects of Tobacco Withdrawal on Executive Functions
Francesca Eleuteri, Ashok S. Jansari, Claudia Falcone, Lisa S. Arduino
Abtract: Tobacco abstinence is associated with impaired cognitive functioning, particularly in the area of sustained attention and working memory. It seems that tobacco abstinence significantly reduces memory performance under full attention condition for males but not for females. Although, few studies have investigated sex differences in executive functioning. The aim of this study was to investigate whether different executive functions are impaired during acute abstinence of nicotine smoking and how effects differ between males and females. 15 smokers (8 females) were tested twice after 2 hours abstinence in counterbalanced order on the Italian version of JEF© task. Smoking Status (Abstinence vs. Ad Libitum) was manipulated within-subjects in a randomized repeated measures design. In order to capture isolated elements of executive functioning we used the Jansari Assessment of Executive Functions (JEF©), known to have more ecological validity and sensitivity than traditional assessments. Severity of dependence was assessed through Fagerström Tolerance Questionnaire and participants were included if their score was ≥ 3. The analysis revealed that cognitive constructs change across the different Smoking Status and gender. In contrast with the literature, in abstinence condition males performed significantly better than on Ad Libitum condition and compared to females, whereas females performance remained steady across the two Smoking Status. The interaction between Sex, Smoking Status and cognitive constructs indicate that males performed better on creative and selective thinking. The discrepancy with the literature might be explained both in terms of differences in abstinence time window and in the specificity of the cognitive constructs.
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Facial emotion recognition and its relationship with executive functions in bipolar I patients and healthy control
Zahra Farahmand, Mehdi Tehranidoost, Azar Mohammadzade, Elham Davoodi
Abstract: This study aimed to investigate the relationship between facial emotion recognition and executive functions in patients with bipolar during remission period and compare them with healthy controls.
Method: In a case-control design 30 bipolar patients (18-45 years old) examined in remission period after 3-4 weeks of admission. We also assess 30 matched healthy controls. Research instruments were five subtests of Cambridge Neuropsychological Test Automated Battery (CANTAB) including SWM, SSP, SST, CRT, and RVP. We also used SCID-I, BDI-II, BAI-II and YMRS.
Results: There were significant differences between the two groups in executive functions (attention, memory, response inhibition). There was a significant difference ($p<0.05$). In facial emotion recognition the two groups were significantly different in terms of accuracy of emotion recognition, and reaction time of facial recognition ($p<0.05$). There were also significant correlations between facial emotion recognition and memory, attention, as well as response inhibition.
Conclusion: Patients with bipolar disorder, even during symptoms remission have deficits in executive functions (working memory, attention and response inhibition). Defects in executive functions are associated with deficits in facial emotion recognition.
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Bilingual advantage: Language proficiencies and inhibitory control in real-life like environment using E-prime
Samara Hussain
Abstract: Past work regarding monolingual-bilingual comparisons has suggested that linguistic experience can shape cognitive control mechanism (Blumenfeld & Marian, 2011) yet, its applicability to real-life environment remains largely unknown (Dehaene et al., 2015; Barac et al., 2014). With the current controversy regarding executive functioning of monolinguals and bilinguals on classical cognitive experiments, the study aims to investigate whether language proficiency has advances in daily life. Unlike previous research on comparison of monolinguals and bilinguals, the present study investigated the relationship between first (L1) and second-language (L2) proficiency with performance on inhibitory control among bilinguals. Sixty undergraduates from Hong Kong were recruited to

complete LEAP-Q (Language Experience and Proficiency Questionnaire) and an inhibitory control E-Prime experiment consisting of real-life road scenes. The findings indicated that bilinguals with higher second-language (L2) proficiency, including L2 speaking, L2 understanding and L2 reading had better performance on inhibitory control task. No relationship was discovered between first-language (L1) and inhibitory control. The current finding advances understanding on how the habitual inhibition of one language to communicate in the other successfully allows bilinguals to become better in inhibiting irrelevant information. Further implications and limitations are discussed.
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Dissecting the role of the left middle frontal gyrus in Chinese reading: How important are the executive control processes?
Tiffany Ip
The left middle frontal gyrus (LMFG) activates more strongly in reading logographic Chinese than in reading alphabetic scripts, and exhibits functional and structural aberrations in the brains of dyslexic Chinese. While researchers have corroborated the association between the LMFG activation and Chinese reading, contributing factors of this region to reading performance in Chinese is still ill-defined. The present study, therefore, sought to annotate the determining functions of the LMFG in Chinese reading. Nineteen normal-reading university students in the Mainland China participated in a neuroimaging study with four distinct fMRI tasks. All tasks consisted of the working memory component but varied in their respective skills: Task 1 and 2 focused on executive functioning skills whereas Task 3 and 4 emphasized visual-orthography and phonology respectively. Results showed that all four tasks triggered the activity in the LMFG at BA 9, but significant correlations between BA 9 activity and Chinese reading were only obtained in task contrasts which involved working memory with executive control processes.
Behavioral studies in the literature have been proposing different kinds of processing components have their roles in Chinese reading without reaching the consensus on which one dominates. The present results seem to provide an answer from the neuroimaging perspective to the longstanding question - higher-level executive control, which coordinates phonology, visual-orthography and semantics, outweighs any single component in contributing to successful Chinese reading performance. The involvement of the executive control processes also explains why the LMFG plays a central role in Chinese reading.
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Dissociation of executive and attentional elements of the Digit Span Task in a population of older adults: A latent class analysis
Denise LaBelle, Bern Lee, Justin Miller
Objective: The three components of the Digit Span subtest (forward, backward, sequencing) theoretically relate to attention and executive functioning, with forward span associated with basic attention, and backward and sequencing reflecting executive elements of working memory. The current study uses latent class analysis to identify and characterize patterns of performance within the DS task.
Participants and Methods: The analyzed sample (N=875) was drawn from a population of older adults referred for evaluation within a specialty clinic for neurodegenerative diseases. The sample was 54.3% male, 90.2% Caucasian, and had an average age of 74.5 years (SD=6.2) and an average education of 14.7 years (SD=2.8). Class structure was assessed by examination of indices of fit, parsimony, and entropy. Raw and longest-span scores from the three components were used in class construction.
Results: A four-class solution (entropy=.85) was chosen. Class 1 (n=134, 16.7%) was characterized by poor performance across all 3 components. Class 4 (n=272, 30.7%) was characterized by strong performance. Class 2 (n=326, 30.7%) demonstrated average performance, with significantly shorter backwards-span length. Class 3 (n=127, 15.7%) evidenced strong forward span but weaker performance within other components.
Conclusions: Classes reflecting consistently strong, weak, and typical performance were observed. An "atypical" class with weak working memory despite strong attention was also identified, and may reflect a class of individuals with more generalized executive impairment, possibly reflecting neurodegenerative pathology. Future work will explore clinical and neuroanatomical correlates of these classes, with particular attention to other assessments of executive functioning and frontal atrophy.
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Graph theoretical approach; the bridge between cognition and behavior?
W Weeda, EJA Scherder, FA Jonker, K Rauwerda
A promising new integrative approach is the graph theoretical approach. In this approach, tests are explicitly modeled as a network of interrelated variables and the properties of this network are interpreted instead of analyzing tests separately. Our main goal is to explore the complex interrelations (i.e. networks) of different tests of executive functioning and behavioral measures within three groups; a group with no brain damage, non-frontal lesion and frontal lesions, in order to find a more suitable explanation for the ambiguity in literature. A total of 195 patients, no structural lesions (N = 67), non-frontal lesions (N = 67) and frontal lobe damage (N = 61) with different etiologies (TBI; 32.2%, Stroke; 25.6%). A extended neuropsychological battery was administered. For each group the nodes of the network were the cognitive tests (Stroop, WM, TMT, 15-WLT, DAT) and the behavioral questionnaire (FrSBe) and the edges were the partial correlations (correlations between two nodes corrected for the correlation with all other nodes in the network). Networks were estimated within each group using the graphical LASSO. The modularity estimation (clusters), degree of centrality between tests, between centrality between groups were measured. It seems that damage to the frontal lobes results in greater interdependence between the different cognitive and behavioral measures, resulting in a more complex network. The main findings are that this approach is able to demonstrate notable differences in the interrelation between tests of executive functions and behavior in the different groups.
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Assessing inhibitory control in early-stage dementia and Parkinson's disease using the Hayling Test
Anthony Martyr, Elina Boycheva, Aleksandra Kudlicka
Objective: The ability to inhibit irrelevant information is essential for coping with the demands of everyday life. Inhibitory deficits are present in all stages of dementia and commonly observed in people with Parkinson's disease (PwPD). Inhibition is frequently tested with the Stroop Test, but this may lack ecological validity. This study investigates inhibitory control in people with dementia (PwD) and PwPD using a more ecologically valid task; the Hayling Test.
Participants and Methods: 121 people completed the Hayling Test, a test where participants have to complete a sentence with an unrelated word. The sample comprised 34 PwD (age 79.41; MMSE 22.88), 33 PwPD (age 72.21; MMSE 29.39) and 54 healthy older controls (age 72.09; MMSE 28.78). We compared response times and the number and type of errors across the three groups.
Results: PwD took longer to complete the Hayling Test than PwPD who, in turn, took longer than controls. For Type A errors (producing a word that perfectly fits the sentence) PwD committed more errors than PwPD who committed more errors than controls. For Type B errors (producing a word semantically related to the sentence) all groups made a similar number of errors.
Conclusions: The findings suggest that the Hayling Test may be sensitive to verbal suppression deficits and may provide insight into inhibitory control in PwD and PwPD. In particular, a specific tendency to produce the exact word that one tries to suppress is a characteristic inhibitory deficit in dementia and PD captured by the Hayling Test.
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Deficits of operating memory and support of attention in teenagers with cleft palate
Rui Mateus Joaquim, Maria de Lourdes Merighi Tabaquim
Objective: Cognitive deficits have been well documented in children with non-syndromic clefts of the lip and/or palate. However, few studies have formally assessed cognition in teenagers with oral clefts. The objective of this study was to characterize the executive

neuropsychological performance of adolescents with cleft lip and palate.
Method: Data were obtained through psychological assessment instruments in 50 subjects aged between 14 and 17 years old male with cleft lip Rehabilitation Hospital of Craniofacial Anomalies patients male, aged between 14 and 17 years.
Results: It was found that 12% of participants showed indicative of intellectual impairment of the Raven Progressive Matrices (General Scale) while test of Wisconsin Card Sorting Test the category "Failure to maintain the context" was the one that had a percentage of participants with greater difficulty in sustaining attention and employment working memory. Deficits in these skills create impact on the quality of learning and problem solving, found in other categories, such as "learning to learn".
Key words: Cognitive dysfunction; Non-syndromic clefts; Neuropsychological functioning
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Change of performance of Iowa gambling task (IGT) after brain damage: comparison pre and post operation in patients with glioma
Chiharu Niki, Takatsune Kumada, Takashi Maruyama, Manabu Tamura, Yoshihiro Muragaki
Objective: IGT have been used to assess decision making for risk, and several factors such as IQ, working memory and mood disorder show a relationship to performance of IGT. Patients with damage to the frontal cortex, particularly in the right, revealed poor performance of IGT (Buelow & Suhr, 2009). However, controlling all factors affecting IGT is difficult to investigate IGT performance. Here, we assessed IGT performance for the same patients with glioma in pre and post operation, investigated change of performance of them.
Participants and Methods: 30 patients with glioma (16 in the left hemisphere, mean age=37.9; 14 in the right hemisphere, mean age=39.5) who were adapt for a removal surgery participated. A computerized IGT was administered and measured as the difference between performance of pre-and post-operative stages (from post 1M to 3M). Net score was used for data analysis.
Results: 2 way ANOVA (2 (term: pre, post)×5 (block: 5 blocks)) revealed a significant effect of term only in patients with glioma in the right hemisphere (pre>post). Significant effect of block was showed in patients with glioma in the left hemisphere (1 block<2,3,4,5 blocks), and marginally significant effects in patients with glioma in the right (1 block<5 block).
Conclusions: Compared with patients with glioma in the left hemisphere, patients in the right showed failure of IGT in post-operation. However, performance of patients in the right also showed a minor learning effect in a post operation. Learning process for risk might be impaired in them.
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Frontal lobe contributions to academic achievement of university students
Graham Pluck, Carlos Ruales Chieruzzi, Edgar Paucar, Victoria Andrade-Guimaraes, Ana Trueba
Objective: Abilities thought to be dependent on frontal lobe functioning, such as inhibition, multi-tasking, or abstract reasoning, could potentially be better predictors of success than traditional intelligence testing
Participants and Methods: A sample of 64 undergraduate students were assessed with a standard IQ test (WAIS-IV) and five tests that based on previously neuropsychological work are known to be impaired by frontal lobe lesions independently of effects on fluid intelligence (Proverbs, Faux-pas, Hotel, Hayling and Stop-signal tasks). Grade point average (GPA) data on participants was collected as a measure of academic achievement.
Results: We found a significant correlation between GPA scores and IQ. However, we also found that two different neuropsychological measures also significantly correlated with GPA. Linear regression analysis revealed that the best model of GPA was IQ plus scores on the Stop-signal and Hayling tasks (R=.506, p<.001). In fact, IQ only predicts only about 7% of the variance in GPA scores, the addition of Stop-signal and the Hayling task data increases this to about 22%.
Conclusions: Our findings suggest that verbal response inhibition (Hayling test) and motor response inhibition (Stop-signal task) both significantly and independently predict academic success of university students, and they do so independently of IQ scores. Interestingly, both of these tests have been linked to the function of inferior and dorsolateral right frontal cortex. On the other hand, neuropsychological evidence suggests a left-hemisphere fronto-parietal system underlies general intelligence. We suggest that academic achievement is dependent on the function of these relatively independent left and right-hemisphere systems.
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Preserved executive planning ability in 'at-risk' adolescents living in foster care homes
Graham Pluck, Isabela Lara, Karla Haro, Valeria Valdivieso, Cris Hugo, Ana Trueba
Objective: Children living in foster care homes provided by the state or charities experience challenging developmental environments compared to conventionally housed children. In addition, many live in foster care due abandonment or past abuse in family homes. It could be expected that such situations would be generally unconducive to optimal neuropsychological development.
Participants and methods: A sample of 36 adolescents living in foster care homes and 40 control children living with their families were recruited (mean age in both groups 15.8 years). All were assessed for general intelligence with the Matrices and Vocabulary tasks of the WISC-IV, for executive functioning with Design Fluency and Tower tasks and for divergent thinking with an Alternative Uses Test.
Results: The foster care sample scored significantly below the control sample on the WISC tasks, Design Fluency and Alternative Uses tests. However, their performances were indistinguishable on the Tower task, a measure of prefrontal mediated executive planning ability. Furthermore, when Matrices scores were used to covary out the effects of general fluid intelligence, the foster care sample appeared to score significantly better than the control sample.
Conclusions: The results suggest perseveration of executive planning ability among adolescents raised in foster care homes, and in fact better than normal performance when considering their generally lower fluid intelligence. This dissociation shows that planning ability as measured by the Tower task is somewhat independent of general fluid intelligence and furthermore the two may develop in different ways depending on the demands of the life context of the individual.
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Dissociations after psychosurgery in obsessive-compulsive disorder: A case-controls design
Marcos Rios-Lago, Genny Lubrini, Jose Antonio Periañez, Giorgio Spatola, Roberto Martinez, Juan Alvarez-Linera
Objetctive: Anterior capsulotomy and cingulotomy are potential therapies for OCD. We study the impact of neurosurgery on cognition given that it is not completelly understood.
Method: One OCD patient was treated by mean of MRI-guided stereotactic bilateral cingulotomy and anterior capsulotomy. He completed a neuropsychological assessment before neurosurgery. After 6 months, he was assessed to detect changes after surgery. 9 months later, the patient requested a new assessment given that the symptoms had appeared again. Ten healthy participants took part in the study. The assessment included a complete neuropsychological battery, and MRI study.
Results: OCDPatient (before surgery) scored within the severe range in the YBOCS, STAI and BDI.No differences were found in neuropsychological assessment with the control group. After surgery, the score of Y-BOCS, STAI and BDI-II significantly decreased, and a slight increase in neuropsychological scores was found. However, as a negative result, a worse performance was found for WCST and TMT. At second follow up, most of the results appeard to be similar to the situation previos to the surgery. The DTI showed that some tracts previously lesioned, now had been reconnected (anterior capsula).
Conclusions: Psychosurgery seem to be effective in reducing OCD symptoms. The improvements were impressive at first follow up. However, the results obtained in the second follow up were surprising given that they are probably caused by an undesirable plasticity process affecting the anterior capsula. The results are

discussed under three dissociations: emotion-cognition; obsession-compulsion, and capsula-cingulate. fMRI results help to disentangle the mechanisms underlying these dissociations.
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TMS over the DLPFC induced changes in the selection bias in a non-veridical decision making task
Jaan Tulviste, Elkhonon Goldberg, Kenneth Podell, Talis Bachmann
Objective: The purpose of this study was to test the hypothesis that prefrontal cortical mechanisms involved in non-veridical decision making do not overlap with those of veridical decision making.
Participants and Methods: Healthy subjects performed an experimental task assessing free choice, agent-centered decision making (The Cognitive Bias Task) and a veridical control task related to visuospatial working memory (the Moving Spot Task). Transcranial magnetic stimulation (TMS) was applied to the left and right dorsolateral prefrontal cortex (DLPFC) using 1Hz and 10Hz (intermittent) rTMS and sham protocols.
Results: Both 1Hz and 10Hz stimulation of the DLPFC triggered a shift towards a more context-independent, internal representations driven non-veridical selection bias. A significantly reduced preference for choosing objects based on similarity was detected, following both 1Hz and 10Hz treatment of the right as well as 1Hz rTMS of the left DLPFC. Only 1Hz rTMS treatment of the right DLPFC triggered a significant improvement in visuospatial working memory performance on the veridical task.
Conclusions: Neuromodulation of the DLPFC can selectively impact non-veridical decision making. The effects induced by prefrontal TMS mimicked posterior lesions, suggesting that prefrontal stimulation influenced neuronal activity in remote cortical regions interconnected with the stimulation site.
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The pre-SMA is a major hub for higher cognitive functions
Francesco Vergani, Flavio Dell'Acqua, Luis Lacerda, Keyoumars Ashkan, Ranjeev Bhangoo, Marco Catani
Objective: The pre-Supplementary Motor Area (pre-SMA) is often considered an area linked to motor functions. However, recent investigations extend its role to other aspects of human cognition including language production, social communicative intention, salience and response inhibition. We combined post-mortem dissection and in vivo Diffusion Imaging tractography to investigate the white matter connections of the pre-SMA in humans.
Methods: Post-mortem dissections were performed according to the Klingler technique. Twelve specimens were fixed in 10% formalin and frozen at -15°C for two weeks. After thawing, dissection was performed with blunt dissectors. For Diffusion tractography, high-resolution diffusion imaging datasets from 10 adult healthy controls from the Human Connectome Project database were used. Whole brain tractography was performed using a spherical deconvolution approach.
Results: four main connections were identified: 1) frontal “aslant” fascicle, directly connecting the pre-SMA with the pars opercularis of the inferior frontal gyrus; 2) U-fibres running in the cingulate sulcus, connecting the pre-SMA with the cingulate gyrus; 3) medial fibres connecting the pre-SMA with the striatum; 4) pre-SMA callosal fibres. No connections with primary motor areas were demonstrated. Good concordance was observed between post-mortem dissections and Diffusion tractography.
Conclusions: the pre-SMA shows direct white matter connections with language and limbic areas, which can explain the pre-SMA role in the initiation of speech and in the motor processing of emotional experience, respectively. Direct connections through the striatum can play a role in the initiation and modulation of voluntary movement.
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Neuroanatomical correlates in the Stroop interference condition: a systematic review
Kim Verweij, Martine van Zandvoort
Objective: The neuroanatomical basis of performance in the Stroop interference condition is not completely evident. A systematic review of the literature is needed to provide more insight in (i) the specific brain regions involved in the interference condition and (ii) whether the reported brain areas can be traced to different operationalizations of the Stroop interference condition (errors, reaction time, interference, time to complete and correct responses).
Participants and Methods: A systematic literature search was conducted in the pubmed database. Inclusion criteria were: (1) participants included for neurological problems (2) operationalization used for the assessment of performance in the interference condition is explicitly named (3) an association between the performance in the interference condition and specific neuroanatomical correlates is reported or could be extracted from the results.
Results: 29 articles met inclusion criteria. Results show that (i) more cortical (52) than subcortical (19) brain areas are involved in the Stroop interference condition. Frontal areas are more frequently found (33) compared to parietal (9) and temporal (10) areas. Moreover (ii), no clear relation between the identified brain areas and different operationalizations of the interference condition was found.
Conclusions: Not only frontal, but also temporal, parietal and subcortical brain areas are involved in the interference condition of the Stroop task. There appeared no clear relation between specific brain areas and specific operationalizations of the Stroop interference condition. This might be biased, since most of the reviewed studies didn’t report how different operationalizations of the Stroop interference condition were distinguished from each other.
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Executive control of hypertension patients - an fMRI study
Marta Witkowska, Patrycja Naumczyk, Krzysztof Jodzio, Agnieszka Sabisz, Beata Graff, Krzysztof Narkiewicz, Edyta Szurowska, Dariusz Gasecki
Objective: Hypertension (HTN) is one of the most common chronic diseases in industrialized societies. More and more frequently the negative consequences of high blood pressure are emphasized as they directly affect the central nervous system, and consequently - cognitive functioning. The main aim of this study was the assessment of cognitive functioning of patients with HTN.
Participants and Methods: A set of neuropsychological tests (CVLT, COWAT, CTT, TMT) and a fMRI version of Stroop test were administered to patients with HTN (n=20) and healthy controls (n=20). Groups did not differ from each other with regards to age, education and gender.
Results: Patients with HTN commit significantly more perseveration errors (COWAT-semantic: t(5,1)=1,85; p<0,05, COWAT-phonemic: t(12,1)=1,68; p<0,001, CVLT: t(7,3)= 2,4; p<0,05) and near-miss response errors in CTT-1 (t(26,42)=2,46; p<0,02) than healthy controls. The Lateralization Indexes based on the fMRI task (executive control in the Stroop test) showed the leftward functional asymmetry (0.365) for HTN patients and the symmetry of brain response (0.020) for controls. These results suggest a potential generalized impairment of executive control, attention and verbal memory of HTN patients. ential generalized impairment of executive control, attention and verbal memory of HTN patients.
Conclusions: HTN patients required greater activation of cognitive resources during the execution of simple tasks. High values of inhibition indicators and the leftward asymmetry of HTN patients compared to controls, led to the conclusion that the executive control of cognitive processes, especially inhibition, demands an excellent cooperation of both hemispheres of the brain.
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Poster Session 4: Thursday 7th July 2016 - 14.00 - 16.00

Assessment/Psychometrics/Methods (Adult) - Poster Session 4 - 14.00 - 16.00		
Number	**Presenter**	**Poster Title**
1	Joost Agelink van Rentergem	Minimizing false positives and enhancing sensitivity in normative comparisons: A user friendly stepdown resampling method
2	Paula Álvarez Merino	Normative data for the Rivermead Behavioral and Memory Test (RBMT) in Spanish older adults
3	Asaad Baksh	Social cognition in adults with autism spectrum disorders - Validation of the Edinburgh Social Cognition Test

		(ESCoT)
4	Alberto Blanco-Campal	The Montreal Cognitive Assessment: A qualitative process approach version (MoCA-QPA)
5	Martin Bunnage	Performance validity test (PVT) failure rates in routine clinical neuropsychology practice within the National Health Service (NHS), UK
6	Ming-Shiou Chiang	A normative study on the Benton Visual Retention Test in Taiwan Sample
7	N.R. de Vent	Advanced Neuropsychological Diagnostics Infrastructure (ANDI): A novel normative database created from control datasets.
8	Unai Diaz-Orueta	European standardised process approach to cognitive evaluation in older people: project overview and preliminary results
9	Michael Ehrensperger	The German 7-item IQCODE - a validation study
10	Evgenia Gkintoni	Psychological distress and coping mechanisms in University students: A data mining approach
11	David Hardy	Inclusion of workload in neuropsychological assessment: A preliminary illustration with TBI patients
12	Sascha Meyer	Measuring cognitive change for normal aging, mild cognitive impairment and Alzheimer dementia: Reliable change index versus regression based index
13	Sascha Meyer	The whole continuum: visual associations to assess episodic memory from healthy persons to Alzheimer's disease.
14	Chiyoko Nagai	Eye movements during a scene description task: A pilot study of healthy subjects
15	Margaret Newson	Relationship between self-report of memory function on PRMQ and performance on standardized memory tests.
16	Yoko Okamura	Validation in Japanese of the Jansari assessment of executive functions (JEF©)
17	Liisa Elina Paavola	Still fit to drive? Evaluating the cognitive risk factors in traffic with elderly Finns
18	Robert Parish	Screening utility of three standalone neuropsychological validity measures in a military TBI clinic
19	Lisa Rapport	Response time patterns on the Warrington Recognition Memory Test in simulated and verified traumatic brain injury
20	Panayiota Shoshilou	Measuring social cognition in Greek: Psychometric properties from an adaptation study in the adult Greek-Cypriot population
21	Isaac Tourgeman	Exploration of the Wechsler Memory Scale Fourth Edition and measures of executive function combined components model
22	Cathy Tran	Developing a culture fair Cognitive Estimates test
23	Ian van der Linde	Restandardisation of the National Adult Reading Test (NART) against the Wechsler Adult Intelligence Scale – 4th Edition (WAIS-IV)
24	Bjorn Vlaskamp	Non-dominant hand use increases completion time on TMT B but not on TMT A
25	Tay Sze Yan	A pilot study of the Singapore-Chinese version of Addenbrooke's Cognitive Exam III (ACE-III-SG-C) for detection of cognitive impairments

Minimizing false positives and enhancing sensitivity in normative comparisons: A userfriendly stepdown resampling method

Joost Agelink van Rentergem, Hilde Huizenga, Raoul Grasman, Dino Muslimovich, Ben Schmand **Objective:** When multiple normative comparisons are made, the probability of a deviating score greatly increases, even if the patient does not have any cognitive problems at all. Such false positives can be harmful, as they may lead to an unnecessary diagnosis.
A Bonferroni-correction solves this issue. However, Bonferroni-corrections can make comparisons so conservative that comparisons will hardly ever indicate abnormality, even for patients that do have cognitive problems. Such false negatives can be harmful as well, as they may lead to the incorrect rejection of a diagnostic hypothesis. We aim to develop normative comparisons that are 1. not as prone to false positives as multiple uncorrected comparisons, 2. not as insensitive to deviations as multiple Bonferroni-corrected comparisons, and 3. easily accessible and simple to use in clinical practice.
Participants and Methods: The stepdown resampling comparisons method (Huizenga et al., in press) uses the speed of modern computers to yield comparisons that do not give rise to too many false positives and which are also sensitive to subtle deviations. Because this method requires programming, the method is implemented in a userfriendly website (eclip.shinyapps.io/NormativeComparisons). The use of the website is demonstrated through the re-analysis of PD patient data published in Muslimovich et al. (2003).
Results: As predicted, stepdown resampling comparisons are better able to detect subtle abnormalities than Bonferroni-corrected comparisons, and show fewer false positives than uncorrected comparisons.
Conclusion: The website provides a new tool for normative comparisons that is useful to prevent both underdiagnosis and overdiagnosis.
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Normative data for the Rivermead Behavioral and Memory Test (RBMT) in Spanish older adults

María del Carmen Requena-Hernández, Ana María Castro-Laguardia, Yuniel Romero-Quintana, Paula Álvarez-Merino
Objective: One concern of the older adults is to preserve the everyday memory until the end of life. Professionals respond to this need with the design and validation of psychostimulation programs consisting of different kind of memories assessment and training tools. This research aims to provide normative data for the screening version of Rivermead Behavioral and Memory Test (RBMT) for healthy Spanish older adults.
Participants and Methods: The study was conducted with 1007 Spanish older adults (870 female; mean age 71.73, (65-86)). There were registered the educational level and marital status. A score above 27 in the MiniMental State Exam (MMSE) was considered as inclusion criteria. Every participant was assessed with the RBMT screening version, the Geriatric Depression Scale (GDS) and the *Memory Failures* of Everyday Questionnaire (MFE).
Results: There were obtained mean RBMT scores for three age groups. Results show that memory performance is affected by the age and educational level. The memory levels classification criteria from the RBMT used internationally underestimate the actual level of memory functioning of this population.
Conclusions: One of the main contribution of this study is providing normative data for the screening version of the RBMT in the mentioned population. Moreover, this research point out that when we want to make classifications of the functionality of healthy older adults seems insufficient to focus only on mnemonic performance. This study shows that variables such as educational level are relevant in this regard.
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Social Cognition in Adults with Autism Spectrum Disorders - Validation of the Edinburgh Social Cognition Test (ESCoT)

Asaad Baksh, Bonnie Auyeung, Sarah MacPherson, Sharon Abrahams

Objective: Current neuropsychological tools used to assess social cognition either have limited use in clinical settings or do not assess the different aspects of social cognition within the same test. The primary objective of this project was to validate a novel measure of social cognitive functioning called the Edinburgh Social Cognition Test (ESCoT) using adults with Autism Spectrum Disorders (ASD).
Participants and Methods: A total of thirteen adults (7 males, 6 females) with Asperger's syndrome or High Functioning Autism (ASD) and twenty-six neurotypical controls (14 males, 12 females) were recruited. Participants were matched for age and years of education. The ESCoT consists of ten dynamic and animated scenarios that are all self-contained narratives and depict an array of interactions. The test explicitly assesses Cognitive and Affective Theory of Mind and interpersonal and intrapersonal Understanding of Social Norms.
Results: Analysis of variance revealed a significant difference in social cognitive abilities between the two groups. Adults with ASD were significantly impaired on measures of Cognitive (p= .015) and Affective (p= .038) Theory of Mind and interpersonal Understanding of Social Norms (p= .005). In contrast, there was no significant difference in performance on intrapersonal Understanding of Social Norms (p= .355).
Conclusions: These results suggest that adults with ASD are aware of how they should behave in social situations but are not as proficient at assimilating this knowledge as neurotypical adults.
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The Montreal Cognitive Assessment: A Qualitative Process Approach Version (MoCA-QPA)
Alberto Blanco-Campal, Robert Coen, Unai Diaz-Orueta, Kate Irving, Teresa Burke
Objective: The Montreal Cognitive Assessment (MoCA) is a widely used cognitive screening tool, purported to measure 6 different cognitive domains, designed to detect Mild Cognitive Impairment. Each MoCA task is subsumed under a single cognitive domain, giving the impression of measuring a single cognitive function when in fact these are complex multifactorial tasks requiring numerous cognitive processes for successful completion e.g. Exploratory Factor Analysis shows that many MoCA items cross-load onto several factors and are not clearly a measure of any single domain (Coen et al 2016). The existing MoCA employs a single-score method for quantifying performance on each cognitive task, hindering the inference of the primary cognitive deficit/s responsible for failure. Using the principles of Qualitative Process Approach (QPA) we propose the development of a MoCA-QPA, to complement the existing version - retaining a 30-point score but incorporating additional qualitative features.
Participants and Methods: Brief complimentary tasks, new indices reflecting distinct underlying cognitive processes required for task completion and a range of qualitative error scoring systems were identified to help capture clinically rich qualitative information to assist clinicians in identifying examinees' distinct cognitive profile. These will be 'road-tested' with 100 healthy older volunteers with normal cognitive aging and/or subjective memory complaints.
Results: We detail our initial MoCA-QPA protocol with explanations of test administration and scoring systems.
Conclusion: The MoCA-QPA has the potential to enhance the existing MoCA's capacity for differential diagnosis by providing information on the quality of errors and means by which individuals complete each cognitive task.
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Performance validity test (PVT) failure rates in routine clinical neuropsychology practice within the National Health Service (NHS), UK
Martin Bunnage, Leyla Allardice-Bunnage
Participants and Methods: Archival data from 87 consecutive new, neurologically heterogenous, adult outpatient referrals for neuropsychological assessment, not in relation to dementia, were analysed. Patients completed the Test of Memory Malingering (TOMM) and or Reliable Digit Span (RDS).
Results: When PVT-failure was defined as either a TOMM-T1 score of <=40, a TOMM-T2 score of <=44, or an RDS score of <=6 failure occurred in 21%. Amongst this group 72% failed TOMM-T1 criteria but only 39% failed TOMM-T2 criteria. Where results were discordant it was in the direction of failing TOMM-T1 but passing TOMM-T2. Amongst the sample classified as failing, 83% had the RDS. TOMM-T1 and RDS failure was concordant in 27%. Where discordant it was in the direction of failing TOMM-T1 and passing RDS in 40% and passing TOMM-T1 and failing RDS in 33%. TOMM-T2 and RDS failure was concordant in 40% and where discordant it was in the direction of failing TOMM-T2 and passing RDS in 13% and passing TOMM-T2 and failing RDS in 47%. When PVT-failure was re-defined as failing either TOMM-T2 or RDS 16% failed.
Conclusion: Some patients undergoing neuropsychological assessment at a NHS neurosciences hospital fail PVTs. The conservative estimate of PVT-failure was 16%.
PVT use is appropriate for routine NHS clinical practice, given the percentage of cases failing PVTs, but screening-in 'poor effort' using only TOMM-T1 with a cut-off of 40 is not recommended because of the risk of false positive errors.
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A Normative study on the Benton Visual Retention Test in Taiwan Sample
Ming-Shiou Chiang, Hsin-Te Chang, Ya-Mei Lai, Ming-Jang Chiu, Ting-Wen Cheng, Ta-Fu Chen, Mau-Sun Hua
Objective: The Benton Visual Retention Test (BVRT) is a well-known and commonly-used test for clinical assessment and research to measure visual perception, visual memory, and visuoconstructive ability due to its convenience to use, short administration time, and the availability of multiple parallel forms. However, the current available norms mostly based on atypical samples, are lacking in taking demographic characteristics into account and adequately exploring psychometric properties. The present study was thus aimed to investigate these issues.
Participants and Methods: A total of 308 healthy adults (140 males, 168 females) were recruited by stratified sampling according to their demographic backgrounds. Each subject received the BVRT-Form C and a battery of neuropsychological tests. Twenty one patients with amnestic Mild Cognitive Impairment (aMCI) were also included for further verifying the validity of the test.
Results: The data analyses revealed that age and education influenced the correct and error scores of the BVRT. Additionally, the results showed that the error scores were more vulnerable to aging effects than the correct scores. Both correct and error scores of the test did demonstrate good test-retest reliability, criterion-related validity and construct validity, but moderate alternate-forms reliability.
Conclusions: Based on the present study, a demographic-corrected norm for the BVRT appears necessary and generally the test has sound psychometric properties in Taiwanese sample. However, the equivalence of the three Forms of the test needs further investigation.
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Advanced Neuropsychological Diagnostics Infrastructure (ANDI): A Novel Normative Database Created from Control Datasets
N.R. de Vent, J.A. Agelink van Rentergem, B.A. Schmand, J.M.J. Murre, H.M. Huizenga
Objective: The Advanced Neuropsychological Diagnostics Infrastructure (ANDI) is a large online database that is aimed at improving neuropsychological assessment in clinical practice and research.
Participants and Methods: Data which were gathered in various neuropsychological research projects are combined into one single normative database, which is based on test scores of over 25,000 healthy subjects.
Results: In this paper we describe the steps that were taken in order to create the infrastructure such as matching variables from multiple datasets, removing outliers, determining the influence of the demographic variables and finding appropriate transformations for normality. We also give a brief description of the current contents of the ANDI database.
Conclusions: Because of the unique structure of the database, it facilitates new (multivariate) normative comparison methods that were not feasible before, which offer new ways of determining whether profiles of scores obtained by patients are abnormal.

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European Standardised Process Approach to Cognitive Evaluation in Older People: Project Overview and Preliminary Results

Unai Diaz-Orueta, Alberto Blanco-Campal, Kate Irving, Teresa Burke

Objective: Cognitive difficulties represent the hallmark of many neurodegenerative conditions and cognitive evaluation represents one major pillar of current methods of dementia detection and diagnosis. Using the principles of Qualitative Process Approach (QPA), the goal of this project is to identify and develop a battery of cognitive tests, both in paper-and-pencil and, where appropriate, computerised versions, to enable a wide range of clinicians improve early and accurate differentiation between normal and abnormal cognitive aging.
Participants and Methods: Initial selection of tests for detailed analysis and potential inclusion in a test battery to be "road-tested" with 100 healthy older volunteers with normal cognitive aging and/or with subjective memory complaints were identified based on literature review and expert opinion. Each test was then decomposed into its underlying fundamental cognitive processes; and protocols were developed to help capture clinically rich qualitative information. The battery, which will be extended further as the project progresses is designed to capture the behavioural processes and strategies adopted by test-takers.
Results: We detail our initial test protocols in relation to the tests we have already selected and preliminary results on our effort to identify additional neuropsychological tests for "road-testing" are presented.
Conclusion: Minor revisions to existing cognitive tests can, we believe offer a rich qualitative data with potential to enhance differential diagnosis. This approach is promising and, with further refinement, should result in our identification and development of an innovative test battery designed for reliable and valid early detection of MCI and dementia.
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The German 7-item IQCODE - a validation study

Michael M. Ehrensperger, Andreas U. Monsch

Objective: Information from family members about (cognitive) change of patients is essential for an efficient case-finding procedure. In 2013 we had found that a new very short, 7-item version of the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE; Ehrensperger et al., 2013) showed very similar diagnostic accuracies compared to the 16-item version. The goal of the current study was to compare the diagnostic accuracies of these two IQCODE versions in new independent groups of patients with mild cognitive impairment (MCI) or with early Alzheimer's dementia (AD).
Participants and Methods: IQCODE data from the original sample of 453 normal controls (NC; 50% men, age(y)=69.5±8.2, education(y)=12.2±2.9, MMSE=28.9±1.2), the new group of 163 patients with MCI (50% men, age(y)=72.2±8.9, education(y)=12.3±3.0, MMSE=27.8±1.6) and the new group of 163 patients with AD (45% men, age(y)=77.2±6.4, education(y)=11.8±2.8, MMSE=25.9±1.6) were included.
Results: Correlation coefficients between the 16- and 7-item versions were: NC=.951, MCI= .942, AD=.925, and MCI+AD=.944 (all p<.0001). The correct classification rates - based on binary logistic regressions - and the optimal cut-off scores (OCS) with the new samples were very comparable with the original analyses (16-items: NC/MCI+AD new=83.5%, OCS-new=3.19, original=85.5%, OCS-original=3.19; 7-items: NC/MCI+AD new=82.6%, OCS-new=3.57, original=85.3%, OCS-original=3.43).
Conclusions: This validation study with two independent new patient samples showed again very high diagnostic accuracy for the very short 7-item version of the German IQCODE. Thus its use to complement the formal examination and interview of the patient in a case-finding procedure is warranted.
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Psychological Distress and Coping Mechanisms in University Students: A Data Mining Approach

Constantinos Halkiopoulos, Kostas Giotopoulos, Evgenia Gkintoni, Gerasimos Antzoulatos, Hra Antonopoulou

Objective: In this paper were applied Data Mining methods in order to evaluate the psychological distress of students in association with the ways of coping strategies that adopt when they have to confront stressful situations.
Participants and Methods: The sample comprised of 200 university students, males and females, aged 18-26 years and assessed using self-administered questionnaires. For recording, tracing and evaluation of the psychological distress was used the standardized scale Impact of Event Scale (Horowitz, Wilner, & Alvarez, 1979) which remains one of the most widely used self-report measures of posttraumatic stress. Also for the measurement of coping strategies was used the 38-item Coping Strategies Questionnaire (Lazarus, Folkman;1980,1984). The methodology adopted, in first phase consists of electronic questionnaires, which were created and posted through the website http://www.cicos.gr. Subsequently data were collected and preprocessed from the questionnaires and then introduced into the R (Programming Language and Machine Learning Platform) for analysis and extraction of useful knowledge.
Results and Conclusions: More specifically, through using classification algorithms (ID3, C4.5) there was a production of prospectively decision trees. Furthermore, clustering technique (*K-Means* algorithm), was applied and the parameters of the algorithm were set, depending on the application cases, and also the results were correlated with the birth-place and the place of present residence, educational background of both the respondents and first-degree relatives, professional occupation of parents and other parameters, in order to evaluate and assess the significance of exported rules / conclusions.
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Inclusion of Workload in Neuropsychological Assessment: A Preliminary Illustration with TBI Patients

David Hardy, Matthew Wright, Paul Vespa, David Hovda, David Plurad

Objective: Preliminary results from a neuropsychological assessment of traumatic brain injury patients are presented. Unique in this assessment is the inclusion of a measure of workload, in this case the NASA Task Load Index (NASA-TLX).
Participants and Methods: Twenty TBI patients and 32 controls completed a neuropsychological test battery assessing the following domains: Attention, Memory, Executive Function, Language, Visuospatial Skills, and an overall Global measure. Workload was assessed after each set of tests with the NASA-TLX, a self-report instrument that includes six subscales (Mental Demand, Physical Demand, Temporal Demand, Effort, Frustration, and Performance) on a 0-100 scale.
Results: Setting alpha at .05, with test performance measures a significant group difference was found in the Attention and Memory domains. The lack of group difference in the other domains could be due to weak statistical power due to small sample sizes. Nonetheless, in two non-significant test domains (e.g., Visuospatial Skills and Global), group differences—with the TBI group reporting higher levels--were more apparent for workload (NASA-TLX) measures (e.g., Mental Demand, Temporal Demand, Effort, and an overall workload score).
Conclusions: If workload levels are higher in a patient or group of patients, it is argued that cognitive status is not equivalent or normal in this scenario, despite comparable test performance. Results of this study suggest that the inclusion of workload as a variable in neuropsychological assessment, and the usage of the NASA-TLX in particular, could be useful in acquiring additional and distinct information on the cognitive status of the patient.
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Measuring Cognitive Change for Normal Aging, Mild Cognitive Impairment and Alzheimer Dementia: Reliable Change Index versus Regression Based Index

Sascha R.A. Meyer, Jos F.M. De Jonghe, Tessa Van der Knijff, Pauline E.J. Spaan, Ben Schmand, Rudolf W.H.M. Ponds

Introduction: Progressive episodic memory impairment is a core symptom of Alzheimer's disease, and repeated neuropsychological assessments can be useful for measuring decline. We determined accuracy of two statistical methods that measure change.

Methods: In this prospective study, healthy controls (HCs) (n = 24) and mild cognitive impairment (MCI) patients (n = 25) were tested twice with the Visual Association Test (VAT) and the Rey Auditory and Verbal Learning Test (RAVLT) with an interval of four to 15 months. Reliable Change Indices + Practice Effect (RCI+PE) and Regression Based Indices (SRB) were compared. Alternatively, to adjust for ceiling effects in HCs on the VAT, we tested 19 MCI patients with a one-hour assessment interval as new controls (MCI-C).
Results: Test-retest reliabilities for RAVLT immediate- and delayed recall were high (r > .70); for VAT low (r = .40). Not more than 5% of HCs deteriorated on all cognitive tests as measured with the SRB method. The proportion of HCs that declined on tests with high test-retest-reliability was significant higher using the RCI+PE (respectively 12.5% and 16.7%). For patients, the SRB-method was significantly stricter than the RCI+PE-method. Using the alternative approach for the VAT, it's test-retest reliability increased (r = .76); 5.3% of MCI-C deteriorated according to the SRB-method, while 15.8% deteriorated according to the RCI+PE-method. For patients, the SRB-method was not stricter than the RCI+PE-method.
Conclusion: The SRB-method predicts deterioration on episodic memory tests more accurately than the RCI+PE-method. Ceiling effects may be a threat to such indices.
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The Whole Continuum: Visual Associations to Assess Episodic Memory from Healthy Persons to Alzheimer's Disease
Sascha R.A. Meyer, Jos F.M. De Jonghe, Rudolf W.H.M. Ponds
Introduction: Episodic memory impairment is a cognitive hallmark of Alzheimer's disease (AD). Different cognitive tests measure symptoms best at different stages of the disease. Subtle cognitive changes that are present in the prodromal phase need to be differentiated from normal cognitive function. This requires tests that cover a wide range of cognitive decline. With newly constructed test items, we doubled the number of test items of the Visual Association Test (VASVT) and varied the level of difficulty of the memory subtests from intermediate (paired associate recall) to difficult (free recall) to easy (multiple choice).
Methods: This cross-sectional study compared test scores of the VASVT memory subtests between healthy controls (HCs) (*n* = 174) and patients with AD or mild cognitive impairment (AD/MCI) (*n* = 31) by use of Receiver Operating Characteristics analyses. Normative data were established.
Results: The VASVT showed high sensitivity and specificity for all memory subtests (83.9% - 98.3%). For HCs, paired associate recall showed a highly negatively skewed J-curve distribution (z = -5.7), free recall showed a normal distribution, with age (*r* = -.43; *p* < .001) and level of education (*r* = .28; *p* < .001) influencing total scores, and multiple choice showed a strong ceiling effect, with 99.4% of HCs making not more than 1 error.
Conclusion: The VASVT memory subtests clearly differentiate AD/MCI patients from HCs. The varying levels of difficulty potentially enable a more accurate classification of the level of episodic memory impairment from HCs to AD.
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Eye movements during a scene description task: A pilot study of healthy subjects
Chiyoko Nagai, Yuri Soma, Fumiaki Saito, Masahiro Sonoo
Background and Aims: A scene description task is commonly used for assessment of patients with cognitive dysfunction, including aphasia. However, how healthy individuals would react to the task is mostly unknown. We predict that eye movements during the task reflect various cognitive abilities, such as speech planning and comprehension of the situation. The purpose of this study was to determine the normal eye movement pattern during the task and develop criteria for the assessment of patients with cognitive dysfunction.
Method: Fifteen university students and two postgraduate students (10 males, 7 females) participated in the study. After completing Raven's Colored Progressive Matrices (RCPM), a brief cognitive function test, subjects were instructed to describe aloud the scene of Western Aphasia Battery, which was shown on a 24-inch computer screen. Their speech was recorded along with eye movement data by using an eye-tracking system. Fixation duration and speech were analyzed.
Results: The mean RCPM score was 35.1±1.8. The overall eye movement patterns coupled with verbal descriptions were as follows: i) an overview of the picture for a few seconds before and after serial utterances; ii) looking at human items longer than nonhuman items; iii) talking about an item while eyes were fixated on the next item to refer to.
Conclusions: Eye movements of healthy subjects during a scene description task showed a certain pattern. Therefore, the eye-tracking method is a useful measure for cognitive assessment.
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Relationship between self-report of memory function on PRMQ and performance on standardized memory tests
Margaret Newson, Jennifer Simmons, Brogan Knight, Nadiah Harun, Jon Scott
Objective: In clinical neuropsychological examinations, it can be informative to compare self-report of memory function with actual memory test performance. For example, a significant discrepancy between self-report and test performance could indicate impaired metamemory. In this study we examined the relationship between a standardized self-report measure of memory in everyday situations and performance on four standardized memory tests.
Participants and Methods: 57 healthy older participants completed the PRMQ, WMS-IV LM and VPA subtests, HVLT-R, and CVLT-II.
Results: There were no significant correlations between PRMQ and any of the verbal memory test scores.
Conclusions: The results indicate that self-report PRMQ score is not related to standardized memory test performance. Therefore, a discrepancy between PRMQ score and verbal memory test performance may have no clinical relevance with regard to metamemory. Future research is planned to examine the construct and convergent validity of the PRMQ in more detail using healthy controls and people with neurodegenerative conditions.
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Validation in Japanese of the Jansari assessment of Executive Functions (JEF©)
Yoko Okamura, Keita Amano, Ami Sato, Ashok Jansari
Objectives: Executive dysfunction (ED) frequently occurs in brain injury, but often it is difficult to make a diagnosis especially in the case of medium to high-functioning individuals. However, often these individuals have to give up work because of the lack of a specific diagnosis. The Jansari assessment of Executive Functions (JEF©: Jansari et al., 2014) is an ecologically-valid measure with patients showing significant impairments despite passing standard clinical tests. In Japan, there are few tools for the comprehensive assessment of ED and the Japanese translation of JEF© may be helpful in this regard. In this study, JEF© data obtained for a Japanese translation sample were compared those of the normative sample.
Participants and Methods: Ten participants (7M, 3F) aged 20-27 years (M=21.70, SD=1.85) participated in the study. The Japanese translation of JEF© was run on a standard laptop and resembles playing a computer-game.
Results: T-tests revealed that while the Japanese sample performed similarly to the original normative sample on four of the measures, they had a significantly lower score for Creative-Thinking (t=5.12, p<.001), Adaptive-thinking (t=5.90 p<.001), Action-Based Prospective Memory (PM) (t=4.50, p<.001), and Event-Based PM (t=2.23, p<.05), as well as overall Average JEF© score.
Conclusions: We found significant differences in JEF© scores between the original sample and a Japanese sample. There could be some reasons for the differences, including the possibility that Japanese people aren't used to perform creatively and adaptively because of cultural pressures. Our findings suggest that the Japanese JEF© needs to be adapted culturally.
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Still fit to drive? Evaluating the cognitive risk factors in traffic with elderly Finns
Liisa Elina Paavola, Tapio Paasimaa, Juho Mattila, Sakari Pelkonen

Objective: Over 300 000 elderly Finns are regular car drivers. At their 70´s, they have an extended medical evaluation in order to keep on driving. The evaluation is based on a questionnaire. Aim of this study is to clarify the association between normal aging and the main cognitions required for driving.
Participants and Methods: Thirty drivers (65-75 y, 15M/15F) participated in Our pilot study. They all drive regularly. SIMO is a touch-screen test battery developed for driving evaluation. Unity3D game engine is used as a platform for the program. The same SW can be used e.g. in Windows environment and in Android. Sub-tests are simplified games. They form seven cognitive domains for driving evaluation.
Results: The reaction times of the sample were fast. The correlation between the tasks in the domain of clock orientation was statistically significant. The domains of visual searching and visual divided attention were performed well and the amount of mistakes or omissions was minor. The reliability of the perception of traffic images was tested by forming the sum variables and counting Cronbach´s alphas. Cr α were high (0.812-0.9).
Conclusions: Our results indicate that SIMO is a useful tool in screaning elderly population´s driving fitness. Domains related to visual orientation, planning, divided attention and priorizing visual stimulus in traffic are essential in screening the risk drivers from the population of healthy elderly people. In the future, we will investigate the essence of visual dominance and the role of eye movements in elderly people´s decision-making and traffic behaviour.
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Screening Utility of Three Standalone Neuropsychological Validity Measures in a Military TBI Clinic
John Greenhalgh, Robert Parish, George Hough, Arica Doll, Natalie Ioerger
Objective: Analyses addressed two hypotheses: 1) The Word Memory Test (WMT) is an effective validity screen, eliminating the need for additional standalone measures (Test of Memory and Malingering, TOMM; Word Choice, WC) if passed; 2) Failure on the WMT does not justify terminating cognitive or validity testing: normal subsequent performance is common.
Participants and Methods: Ninety-nine neuropsychological evaluations were obtained from clinical archives. Conventional cut-offs were used for WMT (3 subtests) and TOMM (2 subtests), while WC cutoff was 43 correct. Outcome measures were processing speed (WAIS-IV PSI), memory (CVLT-II Delayed Free Recall, BVMT-R Delayed Free Recall), and complex attention (TMT-B, FAS, WAIS-IV WMI). Abnormal performance was defined as -1.5 below demographically-adjusted means. Additional cutoffs were analyzed post hoc.
Results: Valid WMT performance was associated with only one validity failure on the WC or TOMM--a false-negative rate of about 2%. Failure on the WMT, however, was a poor predictor of abnormal cognitive performance; thus terminating testing would not be justified. About 40% of individuals failing the WMT performed normally (>1.5 std) on all six measures of postconcussive cognitive impairment. A stricter WMT cut-off (200, summed %), reduced this false-positive rate to <5%.
Conclusions: The WMT, if passed, is an effective validity screen in a military TBI clinic, eliminating the need for TOMM and WC administration. However, failure on the WMT does not justify terminating neuropsychological testing unless a stricter threshold is used. Results raise questions about WMT specificity in this population.
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Response Time Patterns on the Warrington Recognition Memory Test in Simulated and Verified Traumatic Brain Injury
Lisa Rapport, Robert Kanser, Robin Hanks, Jesse Bashem, Nia Billings
Objective: The Warrington Recognition Memory Test (RMT) is a clinical tool that has been used in performance validity assessment. This study tested the incremental validity of trial response time (RT) indices over standard accuracy scoring in differentiating adults with verified TBI from adults coached to feign cognitive impairment.
Participants and Methods: Participants were 46 adults with moderate to severe TBI, 46 healthy adult controls (HC), and 39 healthy adults coached to simulate TBI (SIM). The RMT was adapted for computer administration.
Results: The groups differed significantly on average trial RTs, coefficient of variation, RT ratio of correct to incorrect responses, and accuracy. SIM and HC groups differed on accuracy, average RT (Words and Faces) and RT ratio (Words). SIM and TBI groups differed only on accuracy and average trial RT for Words. Interestingly, SIM also rated both Words and Faces as less pleasant than did the TBI group. Logistic regressions with ROC curve analyses showed that RT added unique predictive value to standard accuracy in discriminating HC from SIM; however, it did not add significantly to standard accuracy in discriminating SIM from TBI.
Conclusions: Overall, the RMT performed modestly in discriminating the groups. Although several RT indices differed between SIM and HC, only two improved differentiation of these groups. Few RT indices differed between SIM and TBI, and none improved discrimination between them. RT as a covert measure of performance validity is promising; however, these findings highlight the importance of including a verified TBI group when evaluating performance validity measures.
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Measuring Social Cognition in Greek: Psychometric Properties from an Adaptation study in the Adult Greek-Cypriot Population
Giorgos Metaxas, Panayiota Shoshilou, Fofi Constantinidou
Objective: This study is part of a larger effort to develop and standardize neuropsychological tools in Greek. Specifically, it concerns a battery of tasks measuring aspects of social cognition in the Greek-Cypriot population.
Methods and Participants: A set of social cognition tests, namely «faces test» (Baron-Cohen, Wheelwright & Jolliffe, 1997), “eyes test” (Baron-Cohen & Cross, 1992) the CAM voice-faces test (Golan, Baron-Cohen & Hill, 2006) were translated and adapted in the Greek language. Additionally, a test of recognition of emotional expressions from speed vignettes was created by the authors. The battery was administered to a total of 309 healthy male and female participants (ages = 18-90, mean age = 46.76, SD = 19.55).
Results: Results indicated that the battery could reliably measure social cognition aspects (i.e. emotion recognition in still eyes photos, moving faces and in the voice) in the Greek-Cypriot population. Internal consistency was stronger with tests using dynamic stimuli, i.e. speed vignettes and CAM (Cronbach α=.92) as compared to tests using static stimuli, i.e. faces and eyes tests (Cronbach α o= .60 and .70 respectively). Detailed psychometric properties for the tests will be presented.
Conclusions: Results indicate that the battery could be incorporated with clinical populations demonstrating impairments in social cognition in order to create a standardized battery for clinical measurements with Greek speakers.
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Exploration of the Wechsler Memory Scale Fourth Edition and Measures of Executive Function Combined Components Model
Isaac Tourgeman, Charles Golden, Ryan Black, Stephen Russo
Objective: While memory is the faculty that affords us learning, adaptation and development, it is our executive function that oversees, manages and organizes these abilities. The goal of this study was to consider the relationship between memory and executive function and determine whether these cognitive elements group onto specific components based on their underlying anatomical mechanism and conceptual features.
Participants and Methods: Performances on the Wechsler Memory Scale-Fourth Edition (WMS-IV), the newest edition of the most accepted measure of general memory function, the Wisconsin Card Sort Test (WCST), the Category Test, the Trail Making Test (TMT), the Conner's Continuous Performance Task (CPT-2), and the Tactual Performance Test (TPT) were evaluated in an adult clinical sample through Principal Components Analysis. Components were retained using three criteria: a predetermined four-component structure, eigenvalues exceeding a value of one, and parallel analysis.
Results: Outcomes demonstrated that a four-component model most accurately represented the data. Analyses also revealed that measures of immediate and delayed memory did not uniquely assess memory but instead loaded onto components associated with visual and verbal processing.
Conclusions: The findings were shown to be in support of the brain working in an integrated, systematic manner in which abilities

hierarchically ascend from arousal to tertiary function. In this clinical sample, the distinction of memory was lost to primary and secondary aspects of processing. Consequently, several accepted measures of memory and executive function failed to measure cognitive capacity unique from visual and verbal processing, placing their construct validity and efficacy in question.
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Developing a Culture Fair Cognitive Estimates Test
Cathy Tran
Objective: Cognitive Estimation Tests (CETs) are used to assess decision-making. Previous versions include culturally-biased questions likely to disadvantage certain sections of the population. This study aimed to develop a new culture-fair questionnaire and assess its reliability and validity.
Participants and Methods: A 30-item questionnaire was developed and assessed for culture-fairness. A normative range of answers was gathered, and a scale developed to define level of deviation from typical responses. Performance in a group of people with brain-injury was compared to a matched group of healthy controls. Those with brain-injury deemed able to make significant life decisions were compared with a group considered to lack this capacity, to determine whether this test may be useful when assessing decision-making capacity. Correlational analyses were conducted to determine whether there was a relationship between the test and performance on the Dysexecutive Questionnaire (DEX), a measure of everyday executive functioning. Test-retest reliability was examined with 30 of the normative sample.
Results: Results confirm previous literature showing that those with brain-injury perform significantly worse than healthy controls. The test did not discriminate between patients with and without capacity to make important decisions, did not significantly correlate with the total score on the DEX and demonstrated relatively poor consistency.
Conclusions: Based on these results, CETs do not appear to be reliable or valid enough for use in clinical assessments. A sub-set of the most sensitive items may prove useful, but further work is required to examine the reliability and validity of this item subset in new samples.
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Restandardisation of the National Adult Reading Test (NART) against the Wechsler Adult Intelligence Scale – 4thEdition (WAIS-IV)
Peter Bright, Emily Hale, Victoria Gooch, Thomas Myhill, Ian van der Linde
Objective: Since publication in 1982, the 50-item National Adult Reading Test (NART; Nelson, 1982; NART–R; Nelson & Willison, 1991) has remained a widely adopted method for estimating premorbid intelligence both for clinical and research purposes. However, NART has not been standardized against recent Wechsler Adult Intelligence Scale revisions (WAIS-III, 1997; WAIS-IV, 2008), limiting premorbid IQ estimation accuracy. Our objective, therefore, was to produce reliable estimates of WAIS-IV IQ on the basis of NART performance.
Participants and Methods: NART and WAIS-IV were administered to 92 neurologically healthy British participants (mean age 40 years; range 18-70; SD 16.78). Regression equations were used to produce population estimates of WAIS-IV FSIQ and its constituent indices.
Results: *A* large correlation between NART raw error and WAIS-IV FSIQ was found [$r(90) = .69$, $p < .001$], along with medium to large correlations between NART raw error and constituent WAIS IV indices. FSIQ estimates corresponded most closely to published WAIS/WAIS-R estimates at the high end of the distribution; at the lower end they were approximately equidistant from the discrepant WAIS (low) and WAIS-R (high) values (e.g., 45 errors produces FSIQs of 82 for WAIS-IV, 91 for WAIS and 75 for WAIS-R).
Conclusions: NART is a sensitive predictor of WAIS-IV FSIQ and is likely to remain an important tool for estimating the impact of neurological damage on general cognitive ability, despite availability of other measures. Caution in employing older WAIS/WAIS-R estimates for inferring premorbid WAIS-IV FSIQ is advised, particularly for those with low NART scores.
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A Pilot Study of the Singapore-Chinese Version of Addenbrooke's Cognitive Exam III (ACE-III-SG-C) for Detection of Cognitive Impairments
Way Inn Koay, Christopher R S Gabriel, Simon Kang Seng Ting, Shahul Hameed, Sze Yan Tay
Objective: With a rapidly ageing population, the number of dementia cases in Singapore is set to increase. Hence, early detection is important. The recently developed Addenbrooke's Cognitive Exam III (ACE-III), a valid cognitive screening tool for dementia syndromes which assesses a range of domains including attention, memory, verbal fluency, language and visuospatial abilities, may serve this purpose [Hsieh et al. 2013]. We adapted and translated the original ACE-III into the Singapore-Chinese version (ACE-III-SG-C) after taking into considerations cultural and linguistic aspects. We aim to investigate the utility of the ACE-III-SG-C in discriminating between those with cognitive impairments from those without.
Participants and Methods: 27 participants (No Cognitive Impairment, NCI: 7; amnestic Mild Cognitive Impairment, aMCI: 9; Dementia: 11) who attended Singapore General Hospital were administered a comprehensive neuropsychological assessment to determine their cognitive status. The ACE-III-SG-C and the Mini-Mental State Examination (MMSE) were administered subsequently. Individual scores were summed up to compute the ACE-III-SG-C total score and domain scores.
Results: The MMSE scores ($F(2,24) = 8.841$, $p=0.001$), the ACE-III-SG-C total scores ($F(2,24) = 16.434$, $p<0.001$) as well as all of the ACE-III-SG-C individual cognitive domain scores were significantly different across the three groups. Post hoc comparisons showed that the aMCI group had significantly lower ACE-III-SG-C total scores ($p=0.020$) and memory domain score ($p<0.001$) than the NCI group, while MMSE scores were not significantly different ($p=0.402$).
Conclusions: Thus, ACE-III-SG-C is comparable with MMSE in detecting cognitive impairments. However, ACE-III-SG-C is superior over MMSE in differentiating aMCI group from the NCI group.
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Assessment/Psychometrics/Methods (Child) - Poster Session 4 - 14.00 - 16.00		
Number	**Presenter**	**Poster Title**
26	Kathryn McLennan	The relationship between subjective and objective measures of Executive Function and theory of mind in childhood
27	Judith Salvador-Cruz	ESNB-Mx (Escala de Signos Neuropsicológicos Blandos-Mexico): A new scale for assessing soft neurological signs in Mexican school children

The relationship between subjective and objective measures of Executive Function and Theory of Mind in childhood
Kathryn McLennan, Janet Leathem
Objective: The aim of this study was to explore the relationship between subjective (BRIEF and BASC-2) and objective measures (selected NEPSY-II subtests) of Executive Function and Theory of Mind in childhood.
Participants and Methods: Participants were 241 typically developing children (age 5-12) from two New Zealand cities, recruited as part of a larger study. Parents and teachers completed the BASC-2 and BRIEF rating scales, and children participated in a neuropsychological evaluation which included selected NEPSY-II subtests of Executive Function and Theory of Mind.
Results: Few significant correlations were found between subjective parent and teacher reports and the child's objective performance on the NEPSY-II subtests. However, Theory of Mind performance was related to adaptive skills as rated by both parents and teachers. Significant relationships between the BRIEF and the NEPSY-II differed by informant, with parent ratings related to Theory of Mind and teacher ratings related to more cognitive tasks.
Conclusions: Results suggest the information provided by subjective and objective measures is different, and varies depending on informant.
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ESNB-Mx (Escala de Signos Neuropsicológicos Blandos-Mexico: A new scale for assessing soft neurological signs in Mexican school children
Judith Salvador-Cruz, Carmen Armengol, Cristina Aguillon-Solis, Lucía Amelia Ledesma-Torres
Objective: To develop a sensitive way of assessing soft neurological signs' effects on cognition in Hispanic school children.
Method and Participants: A comprehensive, 140-item brief (90 mins.) neuropsychological scale (ERSN-Mx) tapping on five domains commonly impaired in SNS (psychomotor, attention, executive functions, visuospatial functions and expressive language) was administered to 100 children (50 boys, 50 girls) ages 6-12.
Results: ESBN-Mx has good overall internal consistency (α=0.64) and divergent and convergent validity. Exploratory factor analyses support five functional areas the 140 items were selected to tap on. Attention and executive functions, including resistance to inhibition and various components of working memory, were most readily affected for children with SNBs. Visuospatial difficulties were a second area of vulnerability, followed by language deficits.
Conclusions: This initial stage in the development of the SNB-Mx yielded encouraging results, pointing to its potential utility for a better characterization of individuals with SNS. The performance-based and broad domain of functions included in the scale allows for the identification SBS profiles in a population that presents with a heterogeneous set of signs of neurological compromise. Further studies will seek to analyze whether there are distinct profiles/subtypes in SBS children. Additionally, the relationship of academic (reading, mathematics, tc.) and interpersonal functioning to ESBN-Mx performance will be addressed. It is anticipated that a more in-depth characterization of SNS-related areas of compromise will assist in developing early approaches to remediation.
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Cognitive Intervention/Rehabilitation - Poster Session 4 - 14.00 - 16.00		
Number	**Presenter**	**Poster Title**
33	Tomoko Akamatsu	The effect of rehabilitation tourism for frontal lobe functions of people with Parkinson's disease in Japan
34	Marie Alsamour	Using action observation therapy for the treatment of hemiplegic cerebral palsy
35	Alfonso Caracuel	Can ICT-Based neuropsychological rehabilitation be effective in improving cognition or participation in brain-injury patients?
36	Raymond Chan	The transfer effect of working memory training to enhance hedonic processing in individuals with social anhedonia: A preliminary functional imaging study
37	Laia Costa Samarra	Additional effect of early neurocognitive rehabilitation on executive cognitive function in subacute stroke patients, in the context of intensive rehabilitation program
38	Francesca Meneghello	Cognitive stimulation of the default-mode network in patients with mild cognitive impairment
39	Elisa Di Rosa	Cognitive reserve and neuropsychological rehabilitation: evidence from patients with acquired brain injury
40	YanHong Dong	Efficacy evaluation of a group- based cognitive intervention program for Asian patients with mild cognitive impairment: A pilot study
41	Liam Dorris	An exploratory RCT psychosocial group intervention for young people with epilepsy (PIE trial): 6-week post-intervention outcomes.
42	Ana Lúcia Faria	Personalizing cognitive rehabilitation through a web-based task generator: an evaluation study with stroke patients
43	Carmen García-Sánchez	Intensive melodic intonation in group therapy of chronic aphasic patients: Improves quality and frequency communication.
44	Maite Garolera	Neuropsychological and functional outcomes to cognitive stimulation therapy in Alzheimer's Disease: same profile in responders and non-responders?
(45)	Therese Gilligan	PRESENTATION WITHDRAWN: Rethinking the hemispheric re-balancing account of prism adaptation
46	Jenni Heikkilä	Audiovisual speech training for children with specific language impairment (SLI)
47	Wanping Huang	Cognitive improvement after cranioplasty: A rehabilitation perspective
48	Nicole Hudl	Functional plasticity in the healthy elderly - A working memory training study
49	Kaisa Kanerva	Could a metamemory training support working memory intervention in preschool-aged children?
50	Narinder Kapur	Smartwatches can help in memory rehabilitation
51	Clare Kempnich	Brief computerized training to improve emotion recognition in Huntington's disease: A pilot study
52	Raquel López García	Neuropsychological intervention in a crossed aphasia patient
53	Joseph Maes	Training and transfer effects of response inhibition training in children and adults
54	Vesna Mlinarič Lešnik	The effects of the mindfulness based cognitive rehabilitation programme GOALS on processing speed, distractibility and mental flexibility
55	Jessica Morales Hernández	Neuropsychological intervention under the model of rehabilitative teaching in a patient with sequelae of cerebrovascular accident (CVA).
56	Emilie Ouellet	Memory training in persons with subjective cognitive decline: virtual reality and transfer
57	Ana Paula Pereira	Qualitative perspective in service evaluation of neuropsychological rehabilitation program
58	Sophie van der Linden	Home-based cognitive rehabilitation in brain tumor patients: Feasibility of the evidence-based ReMind program
59	Natalia Varako	Integration of neurofeedback into holistic model of neurorehabilitation

The effect of rehabilitation tourism for frontal lobe functions of people with Parkinson's disease in Japan
Tomoko Akamatsu
Objective: The purpose of this study was to examine the effect of rehabilitative tourism in Japan on the frontal lobe functions of people with Parkinson's disease (PD).
Participants and Methods: Thirty-four (14 men, 20 women) people with PD (age: 65.6 ± 7.4 years, disease duration: 12.6 ± 6.4 years, Hoehn and Yahr stage: 2.8 ± 0.6, MMSE 29 ± 2.0 scores) were recruited from PD support groups in local communities. All people were informed about the study, and they provided written informed consent. Physical activity by activities quantity meter and neuropsychological status were examined in all participants. Each of PD people chose which historical and sightseeing spots to visit with an occupational therapist. The evaluation was performed 1 week before and after the visits to the places of interest.
Results: The PD people' mood and depression scores were significantly lower after visiting the places of scenic beauty and historic interest than before the visits ($p < 0.05$). The time taken to perform Trail Making test A&B and a virtual-reality walking task were also significantly reduced ($p < 0.05$). The physical activity levels were significantly increasing on the day of tourism ($p < 0.01$).
Conclusions: Visits to places of natural beauty and World Heritage Site in Japan may have an impact on the depressive mood and executive functions of people with PD, leading to positive effects on brain activity.
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Using action observation therapy for the treatment of hemiplegic cerebral palsy
Marie Alsamour, Maxime Gilliaux, Anne Renders, Gaëtan Stoquart, Thierry Lejeune, Martin Gareth Edwards
Objective*:* Action Observation Therapy (AOT) has been demonstrated to improve patient's motor planning and execution of action, with observation priming subsequent execution through shared neural processes (the mirror neuron system). Here, we measured the effect of AOT on the upper-limb movement of children with hemiplegic Cerebral Palsy (CP).
Participants and Methods*:* We evaluated 7 patients on their body structure and function (strength, gross / fine manual dexterity and robot-measured kinematics), activity limitation and participation restriction. Participants were tested before and after a control (standard clinical treatment) or experimental treatment session of 7 days. In the experimental condition, additionally to the standard clinical treatment, participants viewed first-person perspective videos of a child performing daily activities embedded within a narrative. The conditions were counterbalanced using a single blind design.
Results*:* Using case analyses, we found significant improvements in four cases for strength, manual dexterity, robot-kinematics and activity limitation following the experimental compared to control condition. Interestingly, these four cases had better levels of initial action ability than the three others.
Conclusions*:* This research supports the use of AOT for hemiplegic motor rehabilitation in CP children. Furthermore, the results appear to indicate that the initial level of action ability explains the efficacy of the AOT; underlying a possible link between the mirror neuron system activation, the observer's motor repertoire and the AOT efficiency. The values of using a narrative treatment for AOT in children, and the three measure dimensions of handicap including robotic kinematics measures will be discussed.
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Can ICT-Based Neuropsychological Rehabilitation be effective in improving Cognition or Participation in brain-injury patients?
Igor Bombin, Inmaculada Fernández, Gloria Saavedra, Carlos Jacas, Alfonso Caracuel, Jennifer Riesgo, Alicia Cifuentes
Objective: We developed an ICT-based online platform (Functi_ON) which comprehends evidence-based restitution, compensation, and substitution neuropsychological rehabilitation (NR) strategies. Its efficacy to improve cognition and participation is currently being tested by a randomised controlled trial (RCT).
Participant & Methods: The current Functi_ON version comprehends restitution exercises for attention, working memory, processing speed, learning and memory, and inhibition; a Psychoeducation module for metacognition training, with a special emphasis on executive cognitive, emotional and behavioral processes; and an online agenda synchronized with the patient's smartphone that serves as activity-reminder and assists patient's relative for online supervision. So far, N=10 patients, with a history of TBI or stroke, with a minimum of 13 months evolution; and a key relative of each, have concluded a cross-over RCT in which three 12-week treatment-conditions are alternated. Patients completed four comprehensive neuropsychological assessments, including measures of attention, working memory, memory, executive function, and functional independence (CHART, PART-O, CIQ-R).
Results: ANOVA for repeated measures showed significant improvements in measures of attention (p=0.003) and executive functions (p=0.001), and lack of them for memory (p=0.909) or working memory (p=0.230); whereas CHART (p<0.001) and PART-O (p=0.001), but no CIQ-R, revealed significant improvements in participation.
Conclusions: preliminary results suggest that Functi-ON may be useful to enhance functional independence and cognition in brain-injury patients. This ICT and evidence-based augmentative neuropsychological rehabilitation tool has been created with the aim of being freely shared and further developed by neuropsychological rehabilitation clinicians and researchers.
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The transfer effect of working memory training to enhance hedonic processing in individuals with social anhedonia: A preliminary functional imaging study
Xu Li, Ya-hui Xiao, Lai-quan Zou, Huan-huan Li, Zhuo-ya Yang, Hai-song Shi, Simon Lui, Eric Cheung, Raymond Chan
Background: Anhedonia refers to the diminished ability to experience pleasure is considered a core feature of the negative symptoms of schizophrenia and is shared by individuals with social anhedonia. Recent studies have implicated the involvement of working memory (WM) ability in hedonic processing in healthy volunteers. However, it is still not clear whether anhedonia could be alleviated by WM training in individuals with social anhedonia.
Objective: The purpose of the current study was to investigate the potential transfer effect of the neural mechanism for hedonic deficits associated with WM training.
Method: Fifteen individuals with social anhedonia were recruited and received 20 sessions of training on dual n-back task, five sessions each week, and each session lasted for about half an hour. The functional imaging paradigms of the monetary incentive delay (MID) and the affective incentive delay (AID) tasks were administered to all participants before and after the training.
Results: Behavioral analysis revealed that WM training could increase performance on WM tasks and reduce the severity of anhedonia. Enhanced brain activations in anticipation phase were observed at the anterior cingulate cortex, the left dorsal striatum and the left precunues on the AID task, and at the dorsolateral prefrontal cortex and the supramarginal gyrus on the MID task. However, activations were reduced during consummatory phase of affective and monetary incentives across several frontal, parietal regions, and some subcortical regions.
Conclusion: This study provides preliminary support for the corresponding benefits of neural mechanism of hedonic processing associated with WM training in individuals with social anhedonia.
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Additional effect of early neurocognitive rehabilitation on executive cognitive function in subacute stroke patients, in the context of intensive rehabilitation program
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Objective: To explore the additional effect of early neurocognitive rehabilitation on executive functions (EEFF), processing speed (SP) and functional status in subacute stroke patients included in an intensive rehabilitation program.
Subjects and Methods: Sixteen subacute stroke patients included in an intensive 3-week intensive rehabilitation program were randomized into two groups. Both groups received intensive general rehabilitation, including physical, occupational and speech therapy. The training group additionally received neurocognitive rehabilitation during 50 minutes/day, 5 times/week. Neurocognitive rehabilitation was based on paper-pencil tasks and was carried out by a neuropsychologist during the 3 weeks. Phonetic fluency (FAS) was used to assess EEFF, Symbol Search WAIS-IV-subtest for SP and the Barthel index for functional status.
Results: A significant time effect was observed in all cognitive (FAS:F=20.36; p
Conclusion: Neurocognitive rehabilitation may add a beneficial impact, due to the specific improvement of the executive functions, in subacute stroke patients that received an intensive rehabilitation therapy. Neurocognitive rehabilitation had no specific effect on the functional status of the participants. However, further studies should be carried out to explore the impact of early neurocognitive rehabilitation on other cognitive domains and its relationship with other functional and quality of life outcomes.
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Cognitive Stimulation of the Default-Mode Network in Patients with Mild Cognitive Impairment
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Objective: Mild Cognitive Impairment (MCI) is often caused by underlying Alzheimer neurodegeneration, cerebrovascular disease, or an interplay between the two. Despite being at risk for dementia, patients at this clinical stage still retain sufficient capacity for neuroplastic changes. This study tested this possibility via a cognitive-stimulation tool designed to regulate functional connectivity of the Default-Mode Network (DMN).
Participants and Methods: Thirty-five patients with a clinical

diagnosis of MCI completed an MRI protocol inclusive of resting-state fMRI scans. Twenty-one participants were assigned to the experimental condition, consisting of a computerised training programme. All exercises included in this protocol were devised to induce coactivation of multiple DMN regions. Fourteen patients acted as controls. The MRI protocol was repeated at the end of the study. Neuropsychological tests were administered at the same time-points. The DMN was computed based on a group-level Independent Component Analysis. Mixed-design models were created to infer the effect of the group-by-timepoint interaction to test the effects of the training programme on cognitive functioning and DMN functional connectivity.
Results: Although no major changes were found in cognitive functioning, a significant effect of the interaction was found in the functional connectivity of the DMN. Up-regulated connectivity was found in superior parietal regions, bilaterally.
Conclusions: This cognitive-stimulation tool triggered increases in connectivity in associative regions which are particularly susceptible to neuropathology. These findings confirm the presence of neuroplasticity at this clinical stage, and indicates that network-based cognitive stimulation might represent a viable therapeutical avenue in the early stage of cognitive decline.
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Cognitive reserve and neuropsychological rehabilitation: evidence from patients with acquired brain injury
Daniela Mapelli, Doriana De Marco, Elisa Di Rosa, Sara Mondini
Objective: The cognitive reserve (CR) hypothesis (Stern, 2009) suggests that education and life experiences can make the brain able to actively cope with damage, as a Traumatic Brain Injury (TBI; Schneider et al., 2014). Here we investigated the role of CR in the neuropsychological rehabilitation outcome, in patients with acquired brain damage.
Participants and Method: 39 patients with vascular stroke and 22 patients with TBI underwent a neuropsychological assessment before (T0) and after (T1) a tailored neuropsychological rehabilitation (from 1 to 6 months). CR was evaluated using the Cognitive Reserve Index questionnaire (CRIq; Nucci et al., 2012), while the outcome of the treatment was quantified by a Δ score, calculated considering the difference between T0 and T1 in terms of performance at the neuropsychological tests whose scores were pathological at T0. Age, etiology and CRIq were then considered as predictors of the Δ score in a multiple linear regression model. Furthermore, “Low CR” and “High CR” sub-groups were created basing on the CRIq, and the Δ scores of these two groups were compared with an independent samples t-test.
Results: “High CR” group had a significant higher Δ score than “Low CR” group ($t_{(59)}$=-3.02; p<.005). The CRIq score was also the only-one significant predictor of the Δ score [Beta = 0.44, $t_{(59)}$ = 3.53, p < 0.005].
Conclusions: Findings confirm that CR is a crucial factor driving neural adaptation during recovery form TBI, and show as this effect exists for other acquired non-traumatic brain lesions, as a vascular accident.
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Efficacy Evaluation of A Group- Based Cognitive Intervention Program for Asian Patients with Mild Cognitive Impairment: A Pilot Study
YanHong Dong, Kim Grandland, Chia Hui Khoo, Jing Xu, Rathi Mahendran
Objective: An innovative cognitive intervention group program is required for patients with Mild Cognitive Impairment (MCI) due to the lack of pharmaceutical treatments. The "Train Your Brain" (TYB) cognitive intervention group program customized for Asian patients to remediate cognitive impairments in patients with MCI. In this pilot study, we aimed to evaluate the feasibility and efficacy of TYB program.
Participants and Methods: MCI patients aged ≥50 years old will be recruited from memory clinic at National University Hospital, Singapore. This pilot study adopts a randomized control trial design with two phases. In Phases 1, the TYB group will attend a 9-session psycho-education intervention group program on brain health and cognitive training. The control group will be waitlisted. Both groups will receive pre/post measures of cognition, psychological wellbeing, memory self-efficacy and daily functioning. Cognitive functioning will be measured by the Mini-Mental State Exam and Montreal Cognitive Assessment as well as a formal neurocognitive battery, while self-report and informant-based measures will evaluate psychological wellbeing, memory self-efficacy and daily functioning. In Phase 2, the TYB group will attend a computerized brain training program. The control group will remain on a waiting list. Two samples t-tests will be employed to compare change in measures between groups.
Results: The contents of TYB program, culturally and linguistically appropriate measures for program efficacy evaluation, and preliminary results will be discussed.
Conclusions: The preliminary evidence and feasibility of a group-based cognitive intervention program will assist in the implementation of such clinical service for MCI patients at memory clinic.
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An Exploratory RCT Psychosocial Group Intervention for Young People with Epilepsy (PIE trial): 6-week post-intervention outcomes
Liam Dorris, Helen Broome, Margaret Wilson, Cathy Grant
Objective: We report on the effectiveness of a manual-based psychosocial group intervention for young people with epilepsy which aimed to improve epilepsy knowledge, self-management skills, mood and quality of life.
Participants & Methods: Eighty-three participants were randomised to treatment or control groups (40:43) in 7 tertiary paediatric neuroscience centres in the UK, using a crossover design. Participants were excluded if reporting suicidal ideation and/or scoring ≥40 on mental health screening measures (BDI-Y & BAI-Y), had a learning disability or other neurological disorder. There were no significant differences between groups in gender (33:50 m/f), age range (12-17 years), or mental health support. The PIE intervention consisted of sessions covering epilepsy knowledge, psycho-education, and the development of coping strategies using guided discussion and role-plays over 6-weekly sessions.
Results: At 6 weeks post-intervention the treatment group (n=39) was compared with a waiting control group (n=38) on a range of standardised measures. There was a significant increase in epilepsy knowledge in the treatment group (Mann-Whitney-test, P=0.04). None of the other measures reached statistical significance. Feedback from young people and their parents indicated improvements in epilepsy knowledge and the ability to manage stress. They also reported benefits from the positive social interaction with other young people and their families during the intervention.
Conclusions: This brief psychosocial group intervention was effective in increasing participants' knowledge of epilepsy. We will describe the feasibility, strengths and limitations of the PIE trial and discuss the challenges of assessing outcomes in psychosocial interventions using an exploratory RCT design.
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Personalizing cognitive rehabilitation through a web-based Task Generator: an evaluation study with stroke patients
Ana Lúcia Faria, Sergi Bermúdez i Badia, Maria Salomé Pinho,
Objective: Combining the accessibility provided by computerized technologies with an objective modeling of clinical experts’ input, we developed the Task Generator (TG), a cognitive rehabilitation web-tool that generates a set of paper-and-pencil tasks, according to patients’ cognitive profiles. The main objective of this study is to assess the validity of this tool for personalizing cognitive rehabilitation.
Participants and Methods: Participants were 20 middle-aged (Mdn=61.50) stroke patients (9 right and 11 left hemisphere), with a median of 2.50 months post-stroke and 4 years of schooling. Their cognitive profile, assessed with the Montreal Cognitive Assessment (MoCA) was used to parameterize a TG training session of 45/60 minutes. The TG (http://neurorehabilitation.m-iti.org/TaskGenerator/) includes 11 paper-and-pencil tasks (Cancellation, Numeric Sequencing, Problems Resolution, Association, Comprehension of Contexts, Image Pairs, Scrambled Words, Labyrinths, Categorization, Actions Sequencing and Memory Recall) for training attention, memory, executive functions, and language.
Results: TG revealed an acceptable internal consistency (α=.786). Considering TG median performance, the correlation with MoCA is moderate (r_s=.520,p=.019), which suggests that performance of the

personalized tasks is not completely determined by cognitive functioning. For instance, performance in more difficult tasks has a very strong correlation (r_s=.872,p<.001) with MoCA, indicating that more difficulty was assigned to participants with higher MoCA score. Strong correlations were found for tasks performance weighed by their demand concerning attention (r_s=.686,p=.001), executive functions (r_s=.742,p<.001) and memory (r_s=.730,p<.001), with MoCA corresponding domains scores. For language, this correlation was moderate (r_s=.475,p=.034).
Conclusions: The TG is a useful reliable tool that easily generates highly personalized and adapted paper-and-pencil tasks.
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Intensive melodic intonation in group therapy of chronic aphasic patients: Improves quality and frequency communication
Carmen García-Sánchez, Julia Vazquez de Sebastian, Isabel Leiva, Lourdes Janz, Armando Estévez-González, Davila Guadalupe, Berthier Marcelo L
Objective: Melodic intonation therapy (MIT) is one of the most formalized treatments used in non-fluent aphasic patients and its principal goal is restore propositive speech. MIT was developed in the 1970s and it is applied individually. We want to evaluate the effectiveness of MIT but applied for first time in groups of three aphasic patients.
Participants and Methods: Twenty non-fluent chronic aphasic patients (n=20; age=60.2±4.5; month post-stroke: 44.7±35.9; and ,Mississippi Aphasia Screening Test (MAST)<90) were evaluated (language and behavior) before and after receiving an intensive MIT treatment(3 hours daily for 10 consecutive days) in groups of three patients with similar severity. Language was evaluated with the Western Aphasia Battery-Aphasia Quotient (WAB-AQ), Boston Naming Test (BNT) and Token Test. Behavioral aspects was evaluated by reliable scales (Starkstein's Aphaty Scale (SAS), the Stroke Aphasic Depression Questionnaire (SADQ) and the Communicative Activity Log (CAL)) filled out by their caregivers
Results: WAB-AQ, BNT, Token Test SAS and SADQ were non significant. But MIT intensive in therapy group improved total score (p<.005), communication frequency (p< .023) and quality (p< .023) of CAL in activity of daily living.
Conclusion: Although no significant changes were observed in specific aspects of language and behavior, the MIT in intensive group therapy increases the communication frequency and quality. This treatment can be successful in a rehabilitation program in conjunction with other known techniques. In addition, a future target should be to study what type of specific aphasic patient will obtain the best results.
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Neuropsychological and functional outcomes to cognitive stimulation therapy in Alzheimer's Disease: same profile in responders and non-responders?
Maite Garolera, María Quintana, Mar Martínez-Moreno, Noemí Cerulla, Gloria Chico
Objectives: Cognitive stimulation has shown to be an effective non-pharmacological treatment in dementia. Despite the published evidence, the benefits of cognitive stimulation are uneven, and have not been studied extensively to distinguish between subjects who are good responders to cognitive stimulation and subjects who are poor responders. This study aims to compare neuropsychological and functional outcomes to cognitive stimulation therapy between good responders from non-responders.
Participants and methods: A retrospective observational study was conducted between 2004-2012 in a sample of 60 users diagnosed with mild Alzheimer's disease (AD), who followed a one-year CS programme and underwent a cognitive and functional assessment before and after the intervention. As a primary measure of treatment response, we used the annual change of the Mini-Mental State Examination (MMSE) scores, which distinguished good responders (R) from non-responders (NR).
Results: 51.7% of patients were classified as R. After 12 months of treatment, R had significantly better results than NR on MMSE, temporal orientation, category evocation and Philadelphia Geriatric Centre-Instrumental Activities of Daily Living (PGC-IADL).
Conclusions: The response to a CS treatment of some subjects over others, is linked to cognitive and functional capacity. This research contributes to characterize the neuropsychological profile that differentiates subjects who respond better than others after the treatment.
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Audiovisual speech training for children with specific language impairment (SLI)
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Objective: The perception of audiovisual and visual speech is impaired in children with specific language impairment (SLI) compared to typically developing children. They rely less on visual speech, which is seen as weaker audiovisual speech perception and poorer speechreading skills. We have developed a computer-based audiovisual training programme for Finnish-speaking children with SLI to improve their phonological skills and short-term memory, and draw their attention to the audiovisual aspects of speech. Programme contains several task types with varying difficulty. Tasks are either phonological tasks utilizing single phoneme changes or short-term memory tasks. In tasks, audiovisual speech is presented as training material; children see a video of a face uttering a word instead of presenting training material in only auditory modality.
Participants and Methods: The efficiency of the programme was tested with twenty 7-10 year old children with SLI. For the training, the participants were divided into two groups: the audiovisual group received the training utilizing audiovisual speech, and the control group received otherwise exactly the same training but with auditory speech only. Training programme was used for six weeks; 5 days a week, 15 minutes a day. Before and after the training, language skills and short-term memory were assessed with behavioral tasks and neuropsychological tests.
Results: The results show that in the audiovisual group, children significantly improved in nonword-repetition test that requires phonological and memory skills, while this improvement was not observed in the control group.
Conclusions: The results suggest that audiovisual speech may be helpful in rehabilitation of children with SLI.
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Cognitive improvement after cranioplasty: A rehabilitation perspective
Wanping Huang, Karen Chua
Objective: The effects of cranioplasty on cognition and rehabilitation were examined in a case of very severe traumatic brain injury (TBI).
Participants and Methods: A 16-year-old female sustained bifrontal contusions and subdural haemorrhage from a road traffic accident on February 2015 and required bifrontal decompressive craniectomy. Duration of post-traumatic amnesia was 51 days. She underwent successful bifrontal cranioplasty in June 2015. Neuropsychological evaluation was conducted pre-and-post cranioplasty, with improvements shown in cognitive domains including, working memory, speed of information processing, verbal learning, and executive function.
Results and Conclusion: As part of cognitive rehabilitation focussing on cognitive adaptation, outpatient sessions included: 1) feedback session and reinforcement of cognitive strengths and weaknesses to build self-awareness; and 2) practising strategies to cope with her cognitive difficulties and optimise her cognitive functioning. She reported to be able to "think clearer" and was observed to engage better following cranioplasty, and participated well in role-play to practise ‘stop-think-do’ and perspective-taking. Psychoeducation and involvement of parents facilitated implementation of a daily schedule as she benefitted from structure. Parents reported an improvement in her ability to "think before she speak or act” and “do more at home”. Current rehabilitation goal was eventual return to school.
Improvements in objective cognitive testing post-cranioplasty were corroborated by patient’s subjective report, parents’ report of patient’s cognitive and overall functioning, as well as clinical presentation. Pre-post neuropsychological assessments objectively documented cognitive changes related to cranioplasty and guided

rehabilitation, as intervention could then be more aptly tailored according to cognitive strengths and weaknesses. These could potentially affect long-term outcome.
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Functional Plasticity in Healthy Elderly - A Working Memory Training Study
Nicole Hudl, Juliane Weicker, Arno Villringer, Angelika Thoene-Otto
Abstract: There is an ongoing debate, whether working memory (WM) capacity, which declines with old age, can be improved by training. In a double-blind randomized control-group design, we examined the impact of an adaptive WM-training in 60 healthy elderly adults (M = 67,78 years; SD = 4,3). They were assigned to 3 groups (n = 20) either receiving an adaptive WM-training (WMT), a placebo training or no training. Aside from neuropsychological parameters, brain activity was measured before and after training (i.e. 4 weeks), using functional magnetic resonance imaging (fMRI), while subjects performed a visuo-spatial WM task. For the behavioural data, reported elsewhere (Weicker et al. in prep), we found gains in the WM-group compared to both control conditions in a WM composite score, but not in the WM-task during scanning.
Concerning brain activation after training, we found a decrease in the left insula for the WM-training (FWE corrected p < .01,) that we did not find in the placebo training group and only to a less extend in the non-training group (left insula; uncorrected p <.01). Only for the control groups instead, we found a generally higher activation in frontal regions (uncorrected p <.01).
These results can be interpreted as more efficient processing after WMT resulting in deactivation in the insula, as well as less frontal activation compared to the increase in the control groups.
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Could a metamemory training support working memory intervention in preschool-aged children?
Kaisa Kanerva, Outi Aaltonen, Minna Kyttälä
Abstract: Working memory (WM) deficits are common in various learning difficulties, e.g. dyscalculia. Recent research has suggested that WM could be malleable and that computerized interventions could enhance WM functioning. In addition, metamemory training has been demonstrated to foster children's WM and mathematical skills in school age. In this study, we investigated whether computerized WM training (N = 17) and metamemory training (N = 17) have effects on six-year-old children's WM and numeracy compared with an active control group (N = 16). In WM training group, we addressed the five-week intervention to train verbal and visuospatial working memory. The children in the metamemory group participated in similar WM training but were required to report their spontaneous mnemonic strategies and encouraged to use them. Our previous finding that a five-week computerized WM intervention is not sufficient to enhance children's WM or numeracy was replicated. Similarly, at the group level, the metamemory training did not show effects on WM or numeracy compared with the control group. However, in the explorative analyses we found individual differences on how children benefited from the metamemory training. Children low in numeracy showed larger gain in complex memory tasks compared with children with typical numeracy. In further analyses of children's verbal reports, we will examine whether the increasing use of novel strategies is related to the training gain. Our results suggest that encouraging children to monitor their own mnemonic strategies could be beneficial for cognitive skills in small children with difficulties in emergent mathematical skills.
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Smartwatches can help in memory rehabilitation
Narinder Kapur, Dalia Levi, Jasmine Halvey
Objective: Assistive technology is an important tool in memory rehabilitation. Wearable devices such as smartwatches are likely to improve compliance in the use of memory aids. Our objective was to ascertain whether smartwatches would prove to be a significant and acceptable adjunct in a memory aids rehabilitation package for brain injury clients.
Participants and Methods. Four patients with hippocampal amnesia were provided with a smartwatch in conjunction with magnetic whiteboards and related stationery aids. The smartwatches were linked by Bluetooth to the patients' smartphones. Patients and carers were trained how to use the smartwatches. Specific goals were documented before intervention, and together with rating scales and questionnaires these formed the basis of the outcome measures.
Results. Specific everyday memory goals were achieved, ratings of memory were improved and patients reported satisfaction in having the smartwatches as an additional memory aid.
Conclusions. We conclude that smartwatches hold promise as tools in compensatory approaches to memory rehabilitation. Their wearable feature, and their Bluetooth link with smartphones, offer specific benefits not found in most other memory aids. More specifically, smartwatches are beneficial due to the following features –
· They are usually kept with the person and seldom left behind, thus improving compliance.
· They can generate a reminder alarm, with tactile cues, even when the patient is separated from his / her smartphone.
· They offer a 'back-up' reminder which provides another chance for the original reminder to be seen and heard (if initially not attended to) or rehearsed (if initially forgotten).
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Brief computerized training to improve emotion recognition in Huntington's disease: A pilot study
Clare Kempnich, Dana Wong, Nellie Georgiou-Karistianis, Julie Stout
Objective: Deficits in the recognition of negative emotions (sadness, fear, anger, and disgust) emerge before clinical diagnosis in Huntington's disease (HD). Computerised training improves emotion recognition in schizophrenia, but has not been trialled in HD. We conducted a pilot study of its efficacy in HD.
Participants and Methods: Twenty premanifest or early symptomatic HD were assigned to treatment (N = 10) or untreated condition (N = 10) using covariate adaptive randomisation. The treatment group was instructed to use a self-guided online training program, MicroExpression Training Tool (METT), twice weekly for four weeks. Measures of emotion recognition and social cognition were administered at baseline and follow up 6-8 weeks later, along with assessment of treatment compliance.
Results: We observed a significant group by time interaction, indicating that treatment was associated with improved overall accuracy in emotion recognition at follow up. The results suggested that effects were driven by improvements in recognising sadness, however this effect was not statistically significant.
Conclusions: Although we had a limited sample size, this pilot study demonstrates proof-of-concept for emotion recognition remediation using the METT in individuals with HD, opening up a potential new avenue for intervention. Further study with a larger sample size is needed to replicate these findings, and to characterise the durability and generalisability of these effects, including the impact of emotion recognition remediation on functional outcomes in HD.
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Neuropsychological intervention in a crossed aphasia patient
Raquel López García, Judith Salvador Cruz, Daniel Rosas Alvarez
Objective: The study aimed to determine the efficacy of a neuropsychological intervention in a patient with crossed aphasia and typical alterations of right hemisphere lesions.
Participants and methods: MS is a 61 year-old right-handed man, professional in physical education. He had a right parietotemporal stroke. He has been diagnosed with disturbances in language (motor aphasia), reading (phonological alexia), writting (agraphia) and also spatial alterations. It is a single-case design with evaluation pre- and post- treatment. The patient received 40 intervention sessions (each lasting one hour and a half). Therapy consisted of three phases: 1) Functional system reorganization to compensate neuropsychological mechanisms alterated (motor sequential organization, analysis and synthesis cutáneo-kinesthetic, and spatial), 2) Teaching actions to encourage the affected links optimization, 3) The inclusion of the person in his activity systems.
Results: After the treament MS showed an improvement in verbal expression, he had a better discourse fluency and a decrease in phonological paraphasias, which also impacted in reading and writting abilities. What is more, it was seen an improvement in his

quality of life because he has more posibilities to be included in social activities with friends and family.
Conclusions: These results suggest that implementation of rehabilitative teaching principles (use of reserve background, intrasystemic and intersystemic organization) was effective. It also had a positive impact in neuropsychological performance and the quality of life of this patient.
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Training and transfer effects of response inhibition training in children and adults
Joseph Maes, Ling Chen, Xin Zhao
Objective: Response inhibition capacities are critical for mental and physical health, as well as adequate social functioning. However, studies assessing the trainability of such capacities, by using computer-based training programs specifically directed at behavioral inhibition, are rare. The purpose of the present two studies was to examine the effect of such a program in two age groups.
Participants and Methods: We adopted a randomized controlled experimental design incorporating pre-training, post-training, and 3- and 6-month follow-up measurements, examining 39 children aged 10–12 years (Study 1) and 46 adults aged 18–24 years (Study 2). The participants were assigned to either a 20-session adaptive response inhibition training condition, which was based on a go/no-go task, or an active control condition. Transfer effects were examined using a go/no-go task (nearest transfer), interference control, working memory updating, and attentional switching tasks (near transfer), and a non-verbal intelligence test (far transfer).
Results: Significant training improvements and a nearest transfer effect were observed for both the children and adults. Reliable but relatively short-lived near-transfer effects were only found for the children, specifically for working memory updating and switching.
Conclusions: These results suggest a greater potential for response-inhibition training programs to enhance aspects of cognitive functioning in healthy children than healthy young adults.
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The effects of the mindfulness based cognitive rehabilitation programme GOALS on processing speed, distractibility and mental flexibility
Vesna Mlinarič Lešnik, Urša Čižman Štaba, Suzana Vrhovac
Objective: Deficits of the attention system are the most common and prominent consequences at the cognitive level of functioning after brain injuries. The mindfulness based cognitive rehabilitation programme Goal-Oriented AttentionaL Self-Regulation (GOALS) aims at improving attention self regulation for such patients. The aim of this study was to examine the effects of the programme in patients with acquired brain injury.
Participants and Methods: The study included 7 subjects treated as inpatients at the University Rehabilitation Institute, Republic of Slovenia, who were included in a four week GOALS programme two times a week. Each patient was assessed at the before and after the programme with the TAP system (Test of Attentional Performance), Alertness, Distractibility and Flexibility tasks. The results were analysed with an effect size measure.
Results: The results indicate a high increase in the effectiveness in set shifting and a moderate increase in speed of reaction on the Flexibility task. On the Distractibility task the effect for both distracter presence and absence condition on reaction times and omissions of targets were mild. Also the effect of error reduction in the absence of distracters was mild. On the alertness task there were no differences.
Conclusion: We concluded that the programme GOALS can contribute to reduction of distractibility and recovery of mental flexibility in patients with acquired brain injury.
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Neuropsychological intervention under the model of rehabilitative teaching in a patient with sequelae of Cerebrovascular Accident (CVA)
Jessica Morales Hernández, Judith Salvador Cruz, Daniel Rosas Álvarez, Ana Ruth Díaz Victoria
Objective: The purpose of the current study was to establish the effectiveness of a rehabilitation program in a patient with neuropsychological alterations due to a stroke.
Participant and Method: A 64-year-old man with 2 years of formal education and right-handed preference. He had lesions in parietal-temporal posterior areas of the left hemisphere due to a CVA. To analyze the effects of the intervention a single-case design with pre- and post-treatment was used. For evaluating the instruments, Barcelona Test, Rey Figure Test, Katz Index of Independence in Activities of Daily Living and Quality of Life and Health Inventory were applied. Alterations of the neuropsychological kinesthetic, kinetic, neurodynamic, spatial mechanisms along with volume of verbal and visual perception were diagnosed. The patient had preservation of auditory analysis and synthesis, control and regulation, and visual analysis and synthesis. The therapy consisted of two weekly sessions of 60 minutes during 9 months, divided into 3 phases: functional reorganization through preserved mechanisms, use of learned strategies in actions and the inclusion in premorbid activities of daily living.
Results: The patient improved in the production of spontaneous speech, repetition, reading, writing and spatial perception of objects. Furthermore, the inclusion in activities of daily living and the increasing of quality of life index were achieved.
Conclusions: An intervention plan under the model of rehabilitative education made a positive impact in the neuropsychological kinesthetic, kinetic, spatial mechanisms and the volume of verbal perception, as well as on the socio-emotional processes and on the patient's quality of life.
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Memory training in persons with subjective cognitive decline: virtual reality and transfer
Emilie Ouellet, Benjamin Boller, Nick Corriveau-Lecavalier, Sylvie Belleville
Objective: The ultimate goal of cognitive training is to have a positive impact that transfers beyond untrained tasks. This study examines both *near* and *far* transferable effects of memory training through repeated sessions and practice in an immersive virtual reality environment (VRE).
Participants and Methods: Forty older adults with memory complaints (mean age = 67.3) received six 1-hour sessions of method of loci training. All participants then explored a virtual shop; during this time one group practiced the strategy, while the other group explored the virtual shop without the strategy. Pre-, mid- and post-training assessments included: recall of visually and auditorily presented words with irrelevant speech distractors (near transfer), memorizing a list of items to buy in the virtual shop, and recalling words while navigating in a virtual car ride (far transfer).
Results: Presence of speech distractors impaired word recall, however, this detrimental effect was reduced following training (visual: mid-post, $p < .05$; auditory: pre-mid, $p < .01$). Memory performances in the virtual shop and in the virtual car ride (pre-mid, $p < .001$ and $< .01$ respectively) were improved following training. Furthermore, a positive correlation was found between improvement on word recall and on the virtual car ride ($r = .34$; $p < .05$). There was no effect related to practicing in VRE.
Conclusion: Repeated sessions of memory training can lead to transfer on untrained tasks in older adults with memory complaints. There is no evidence that exercises in the VRE upgrade transfer effects.
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Qualitative Perspective in Service Evaluation of Neuropsychological Rehabilitation Program
Ana Paula Pereira, Andrew Bateman
Abstract: Traditionally, service evaluation focus on the structural aspects of the neuropsychological rehabilitation (NpRh) programs and assessment is restricted to quantitative aspects of outcomes only. The present study aimed to assess the clients and professionals perspectives of their experience in an NpRh program. Interviews were designed based on the major conceptual framework adopted by the program and encompassed the program's structure, processes and outcomes described after a documental analysis. A total of 11 professionals (How do professionals evaluate their work?

What are the most important elements of the processes in which professionals participate?) and 9 clients (How do clients experience the program? What are the most relevant experiences for clients?) was interviewed. Interviews were analysed using grounded theory principles. Major findings revealed that clients valued the opportunity to work within peer groups and considered that the main changes were related to the way they saw themselves and the disabling condition. They pointed out thatthey would like more support during the implementation of the learned strategies while in the community. Professionals valued the interdisciplinary work as a source of learning and support for their professional growth and pointed out group dynamics and the therapeutic alliance as the most important elements of the program. A contradictory perspective in the role of the family during the rehabilitation process was observed. This study allowed the understanding of the underlying processes and stakeholders experiences of the services and offered insight on the major aspects of the delivery processes involved.
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Home-based cognitive rehabilitation in brain tumor patients: Feasibility of the evidence-based *ReMind* program
Sophie van der Linden, Karin Gehring, Geert-Jan Rutten, Margriet Sitskoorn
Objective: Many patients with primary brain tumors suffer from cognitive deficits. Treatment options for these deficits are scarce, time-consuming and costly. Recent studies showed promising results on the efficacy of cognitive rehabilitation in these patients. Also, the cognitive rehabilitation program (CRP) developed by our group proved effective in an RCT. To increase its accessibility, it was converted into the app-based CRP *ReMind*. We performed a pilot study to evaluate feasibility and patient experience of this new method of training.
Participants and Methods: Prior to surgery, 15 patients with a presumed meningioma or low-grade glioma were included in this study. The CRP *ReMind* incorporated both retraining of attention and practicing of compensational strategies of attention, memory and executive functioning. Patients started 3 months after neurosurgery and spent several hours per week on the program for 10 weeks. Neuropsychological assessments were conducted one day before surgery, 3 months after surgery (i.e. before starting the program) and 6 months after surgery (i.e. immediately after finishing the program). At all time-points, questionnaires on psychosocial and subjective cognitive functioning were administered to patients and caregivers.
Results: Feasibility (i.e. percentages of interested, adhered and dropped-out patients) and patient experience will be presented. Also, results of paired *t*-tests will be presented for a first impression of possible changes in cognitive functioning and patient-reported outcomes (PROs).
Conclusions: This is the first study that provides evidence-based cognitive rehabilitation via a tablet-app in brain tumor patients. An RCT on the effects of *ReMind* on cognitive functioning and PROs is forth-coming.
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Integration of neurofeedback into holistic model of neurorehabilitation
Olga Dobrushina, Natalia Varako, Maria Kovyazina
Objective: Recent advances in neuroscience gave rise to the therapeutic use of neuromodulation. However, the reasonable place for such biomedical techniques in holistic rehabilitation programs remains unknown. Qualitative analysis of the empirical use of neurofeedback in interdisciplinary neurorehabilitation may serve as a first step towards theoretically and evidence-based use.
Participants and Methods: 21 patient undergoing interdisciplinary rehabilitation for TBI, stroke, neurodegenerative disorders, chronic pain received 15 to 20 sessions of infra-low frequency neurofeedback according to Othmer method. For each patient case coordinator was asked to rate the assumed influence of neurofeedback on symptoms by the scale: 0 - no effects, 1 - moderate effects, 2 - intermediate effects, 3 - strong effects.
Results: Intermediate to strong improvements attributed to neurofeedback were seen in neurodynamic functions (attention, mental speed, fatigability), emotional regulation (anxiety, emotional reactivity, mood), sleep quality, body pain, muscle tension, headache, drowsiness and tinnitus, confabulations. Visuospatial gnosis, working memory, planning, initiation seemed to be moderately influenced. Hemiparesis, dystonic movements, aphasia and swallowing problems were unlikely to respond. Positive shifts in state after neurofeedback were only transient when the team failed to grew up patients motivation to changes.
On the base of previous studies, we suggest that neurofeedback affects brain networks. While other rehabilitation components relate mostly on behavioral compensatory strategies, neurofeedback may promote a sort of compensation on the level of inter-brain interactions. That may explain why it seems to be more effective for functions with distributed localization.
Conclusions: Neurofeedback can improve important abilities that are needed to get through holistic rehabilitation program.
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Poster Session 5: Friday 8th July 2016 - 08.30 - 10.30

Acquired Brain Injury, including TBI/ Cerebrovascular Injury and Disease (Adult) - Poster Session 5 - 08.30 - 10.30		
Number	**Presenter**	**Poster Title**
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2	Mark Allen	Standardization of quantitative-fMRI for neurocognitive assessment and rehabilitation of mTBI
3	Alina Fong	Assessing longitudinal neurorehabilitative outcomes using the standardized application of fNCI in mTBI
(4)	Noga Balaban	PRESENTATION WITHDRAWN: Learning from right brain damaged individuals about two aspects of meaning
5	Alfonso Caracuel	CloudRehab: An app for the patient´s empowerment after acquired brain damage
6	Silvia Chapman	Personality correlates of anosognosia: A pilot study
7	Jacinta Douglas	Marital coping and satisfaction following severe traumatic brain injury
8	Alba Gómez	Neuropsychological and behavioral assessment after surgical repair of incidental unruptured intracranial aneurysms.
9	Sarah Hall	Examining the importance of skills in perceiving, understanding and regulating emotions for community integration after acquired brain injury
10	Ana Havelka Mestrovic	Personality changes following surgery of aneurism of brain arteries
11	Maria Hennessy	It's PTA Jim, but not as we know it.
12	Lenka Kramska	Neuropsychological performance after EC-IC bypass surgery – preliminary results.
13	Adriana Leveroni	Anterograde amnesia with preserved recognition: a case study of a bilateral fornix stroke
14	Graham Lowings	Effective Learning after Acquired Brain Injury: A practical guide to support adults with neurological conditions. Neuropsychological Assessments leading to cognitive profiles to inform individual education plans.
15	Christine Padgett	Does Apolipoprotein ε4 interact with age or sex in cognitive function after traumatic brain injury?
16	Ana Paula Pereira	Social support and occupational aspects of adults after stroke
17	Andreea Rădoi	Subjective endorsement of cognitive postconcussional symptoms in a cohort of mild TBI patients. A pilot study

18	Caroline Roberts	Comparing semantic autobiographical memory performance in and out of post-traumatic amnesia
19	Myrthe Scheenen	mTBI patients "at-risk" of suffering from persisting complaints: the role of coping, mood disorders and post-traumatic stress
20	Mitsuyo Shibasaki	Discrimination Thresholds for Recognizing facial emotions in patients with traumatic brain injury
21	Anna Suades	Decision-making after aneurysmal subarachnoid haemorrhage
22	Eleanor Williams	The impacts of "diagnosis threat" on neuropsychological assessment outcomes in individuals receiving clinical services for traumatic brain injury
23	Dana Wong	The role of Valued Living following traumatic brain injury
24	Chi Cheng Yang	A follow-up investigation of work quality in patients with mild traumatic brain injury: Relationships between post-concussion symptoms, work status and work stability
25	Zai-Ting Yeh	Social cognition abilities following traumatic brain injury: The assessment of emotion expression and theory of mind

Effects of group psychotherapy on anger management following acquired brain injury
Tatiana Aboulafia Brakha, Radek Ptak
Objectives: To assess the effects of a anger management group program for patients with acquired brain injury (ABI) on self-reported anger and to identify specific effects of intervention components at different time-points.
Participants and methods: 26 participants with ABI were randomized, 24 started the program and 19 completed it. *Design***:** A paired-randomization was held following the first baseline (T0) and a second baseline (T1) was held several weeks later. One group (n=8) started with an eight-week anger management program followed by a four-week intervention focusing on the psychosocial impact of brain injury. This order was reversed in the other group (n=11). Assessment was carried-out every four weeks (T1 to T4) during the twelve-week intervention period. *Main outcome measures:* The Aggression Questionnaire-12, The State-Trait Anger and Expression Inventory-2, and The Multidimensional Anger Reaction Scale.
Results: Anger levels did not significantly change between T0 and T1, but decreased significantly at T4. Adaptive anger coping strategies also increased following intervention. Inwardly expressed anger decreased following the anger management program compared to the psychosocial adjustment program.
Conclusions: Group psychotherapy may improve parameters of anger management in patients with ABI. However, specific effects of different components of the anger management program merit further investigation.
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Standardization of quantitative-fMRI for neurocognitive assessment and rehabilitation of mTBI
Benjamin Wing, Keifer Weiland, Lindsey Holbrook, Daniel Sands, Alina Fong, Mark Allen
Objective:. Several limitations restrict the clinical application of fMRI, including: a lack of valid, reliable, and objective standardized protocols appropriate for both the fMRI-scanning environment and individualized patient assessment. We present an integrated approach for administering, analyzing, and interpreting fMRI data for general neurocognitive assessment that addresses these limitations, and demonstrate practical feasibility of this approach as illustrated for mTBI diagnosis and treatment in 139 concussed patients.
Participants & Methods:. Our proposed testing battery, *Notus NeuroCogs*™, consists of six fMRI-adaptations of conventional neuropsychological tests. Iterative pilot testing and protocol refinement provided valid, reliable, and objective measurements of optimized brain activation BOLD signals. Data collection identified consistent functional anatomical regions, which collectively formed a normative atlas, or three-dimensional standard distribution of activation across all 51 healthy control subjects.
Results: Data comparison of 69 concussed patients revealed reliable, region-specific activation patterns, or "neuromarkers," associated with mTBI. These five neuromarkers consist of statistically independent patterns of hyper-/hypo-activation and were assessed for reliability with an additional 70 mTBI patients. Neuromarker-directed assessment and treatment was found to be effective in accelerated concussion rehabilitation.
Conclusions: We demonstrate a standardized quantitative-fMRI model that is currently used for general neurocognitive assessment and treatment at the individual patient level, with particular strength in mTBI rehabilitation. Standardized administration of the proposed protocol in conjunction with both normative-based assessment and compliance monitoring for objective interpretation provides three elements which contribute to the establishment of practice standards for the clinical application of fMRI in guiding both neurocognitive assessment and treatment.
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Assessing longitudinal neurorehabilitative outcomes using the standardized application of fNCI in mTBI
Benjamin Wing, Lindsey Holbrook, Daniel Sands, Keifer Weiland, Alina Fong, Mark Allen
Objective: Traditional fMRI relies on group-averaging, where pooled activation is compared between interest and control groups. In order to further employ clinical application of fMRI without reliance on data averaging, we demonstrate a group-summary analysis approach, where single-subject activation is compared to normative datasets and measurements are extrapolated in order to direct both neurocognitive assessment and rehabilitation. Clinical effectiveness of this approach is empirically evaluated in the rehabilitative outcomes of 139 mTBI patients.
Participants & Methods: Prior to rehabilitation, participants received an individualized treatment program as personalized by functional neurocognitive imaging (fNCI). This treatment program prioritized dysfunctional regions of interest unique to each patient. Multiple methods of targeted, cyclical, yet sustained procedures, as directed by fNCI and a multidisciplinary team, provided optimal and individualized treatment. The same fNCI measurements were utilized in the assessment of post-rehabilitative outcomes.
Results: Data collection and analysis confirmed that fNCI-directed treatment was found to be effective in accelerated concussion rehabilitation. Improvement was seen on both objective post-rehabilitative fNCI measurements and subjective symptom report measurements. Further patient variables such as age, time since injury, and external incentive will be discussed.
Conclusions: We present practice-based evidence for the standardized application of fNCI, which is currently used in directing neurorehabilitation, with particular efficiency in mTBI. We indicate the clinical appropriateness of this image-guided approach and demonstrate its effectiveness across varying concussion demographics. Standardized application of this evidence-based practice in general neurocognitive assessment and rehabilitation may be key to establishing clinical fMRI practice standards specifically in guiding neurorehabilitative outcomes.
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CloudRehab: An app for the patient´s empowerment after acquired brain damage
Gustavo Cuberos-Urbano, Elena Ruiz-Soriano, Igor Bombín-González, Alfonso Caracuel,
Objective: To determinate the effectiveness of CloudRehab® in the rehabilitation of a basic daily life activity versus a standard procedure, and also for improvement in quality of life (QoL).
Participants and Methods: The participant was a 53 years old male with right hemiplegic due to a stroke twenty months ago. CloudRehab® (www.cloudrehab.net) is a real context training-based m-health app for patient with brain injury and transdisciplinary teams. Patients train at home following a self video-tutorial and their neuro-rehabilitation teams supervise patient performance by sharing via Cloud computing a training recording. The patient, his wife and the rehabilitation team chosen "enhancing gait pattern" as the most relevant goal for applying the app. A single case research design with two phases (first: 8 days of standard procedure; second: 8 days of standard procedure and training at home with CloudRehab) was conducted. Blind evaluation and the two standard deviation band

method was applied for determining effectiveness of CloudRehab. Pre and post scores in the QOLIBRI (QoL after Brain Injury Questionnaire) was compared.
Results: Patient performance showed stability at the first phase, and improvement in the second phase. Scores of two subscales of the QOLIBRI (Self and Daily Life and Autonomy) were greater after the second phase than before intervention.
Conclusions: CloudRehab® accelerates the rehabilitation process and improve patient QoL. Training at home and videofeedback might to increase awareness of relationship between thought and action. This active role but professional supervision and feedback allows patient's empowerment.
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Personality correlates of Anosognosia: A pilot study
Gianna Cocchini, Silvia Chapman, Usman Khan, Daniel Mograbi,
Objectives: Anosognosia is a disorder of self-awareness defined as *the inability to explicitly acknowledge motor, sensory or cognitive deficits following an acquired brain injury*. Due its complex nature, it has recently been proposed as a *multifaceted syndrome* with different factors affecting awareness of deficit/s. Psychological factors such as personality traits have been proposed as higher order factors that can affect the extent of awareness. Here we present a pilot study investigating the relationship of premorbid personality traits in anosognosia for memory impairment following stroke.
Participants and methods: Nine subacute stroke amnesiacs and nine informants were enrolled in the study. Anosognosia was defined as high discrepancy score between patient and informant on the Prospective and Retrospective Memory Questionnaire (PRMQ). Informants also provided scores for patients' premorbid personality traits (NEO-Five-Factor Inventory).
Results: Three participants showed anosognosia for memory impairment and six acted as controls. The anosognosic group showed significantly lower Neuroticism and higher Extraversion scores (both $p<0.05$) compared to aware patients. Further, both traits were significantly correlated to the PRMQ discrepancy value (e.g. $r=.85$, $p<0.01$ for Extraversion and $r=-.673$, $p<0.05$ for Neuroticism).
Conclusions: Our preliminary findings suggest that lack of awareness can be related to high level of self-deceptive enhancement and positive attentional bias (Extraversion) rather than feelings of inferiority (Neuroticism). Despite these results need further investigation, they suggest a close relationship between premorbid personality traits and anosognosia.
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Marital Coping and Satisfaction following Severe Traumatic Brain Injury
Jacinta Douglas, Christine Bracy
Objective: Social relationships, particularly marital relationships, play an important role in shaping health and wellbeing. The aim of this study was to compare the marital satisfaction and coping efforts of couples living with the consequences of TBI with those of couples who experienced traumatic injury without injury to the brain.
Participants and Methods: Participants were 50 married couples (25 couples in which the husband had sustained severe TBI and 25 couples in which the husband had sustained traumatic orthopaedic injury). The groups were matched with respect to age, education, and length of relationship. Coping efforts were measured with the Marital Coping Inventory developed to identify types of coping (conflict, introspective self-blame, positive approach, self-interest and avoidance) used by couples to address recurring problems. Between and within group differences were analysed using ANOVA and planned comparisons; Pearson's r was used to index the significance of associations.
Results: TBI couples reported significantly poorer marital satisfaction than their orthopaedic counterparts with wives in the TBI group showing the lowest level of satisfaction. Husbands with TBI used significantly less positive approach coping than husbands with orthopaedic injury. Husbands' conflict coping efforts were significantly and negatively associated with satisfaction. Wives in the TBI group used significantly more avoidance coping than wives in the orthopaedic group with a significant positive association evident between their use of avoidance coping and marital satisfaction.
Conclusions: Support to develop coping efforts within a positive approach framework is an important step in moving towards better outcomes for couples following TBI.
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Neuropsychological and behavioral assessment after surgical repair of incidental unruptured intracranial aneurysms
Alba Gómez, Andreu Gabarrós, Montserrat Juncadella
Objective: Most unruptured intracranial aneurysms (UIA) can be treated with low morbidity and mortality. However, the morbidity rate related to surgical clipping has received increased attention as this treatment may be associated with a decline in cognitive function.The goal of this study was to evaluate the cognitive and behavioral functions in patients undergoing surgical clipping of UIA's without previous history of subarachnoid hemorrhage (SAH).
Methods: A consecutive series of 15 patients who underwent surgical clipping of ≥1 UIA's were tested using an extensive neuropsychological protocol within 1 week preoperatively and postoperatively at 4 to 6-month follow-up. A measure of neurobehavioral changes was also obtained with the Iowa Rating Scale of Personality Changes (IRSPC). Wilcoxon signed ranks test was used to examine differences between preoperative and postoperative neuropsychological tests and the IRSPC.
Results: The outcome in all patients was rated as good according to the modified Rankin Scale (mRS) and to the Glasgow Outcome Score (GOS), with 87% of patients (13 cases) exhibiting a good recovery. No significant changes between preoperative and postoperative neuropsychological testing was found. A significant decline in the 'lack of energy' item (p = .039) from the IRSPC was observed. **Conclusions:** We found no evidence of neither cognitive nor behavioral deficits resulting from aneurysm clipping when comparing the postoperative results with the baseline. The intervention demonstrated high efficacy and was associated with low morbidity.
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Examining the importance of skills in perceiving, understanding and regulating emotions for community integration after acquired brain injury
Sarah Hall, Joanne Wrench, Madeleine Connellan, Neira Borcic, Sarah Wilson,
Objective: Variability in recovery trajectories after acquired brain injury (ABI) has prompted research into predictors of functional outcome, such as emotion processing skills. While deficits in facial emotion recognition are now well established, relatively fewer studies have investigated impairments in higher level emotional skills, such as understanding and regulating emotions, and their impact on community functioning. The aim of this study was to investigate the role of perceiving, understanding and regulating emotions as predictors of community integration following ABI, using a three-branch model of emotion processing.
Participants and Methods: 80 participants aged 18-65 years with moderate to severe ABI were recruited from specialist rehabilitation centres in Melbourne, Australia. Average time since ABI was 18 months. Participants completed the Mayer-Salovey-Caruso Emotional Intelligence Test v2.0, Community Integration Questionnaire, Hospital Anxiety and Depression Scale, and Wechsler Adult Intelligence Scale subtests.
Results: Ability scores for perceiving, understanding and regulating emotions were entered in regression analyses as predictors of community integration alongside injury severity, time since injury, general cognitive ability, and symptoms of anxiety and depression. The most important predictors were IQ, symptoms of depression, and emotion regulation ($p < .05$), with emotion regulation skills explaining unique variance in community integration beyond the effects of cognition and mood.
Conclusions: These findings suggest that emotion regulation skills are important to assess following brain injury, as deficits in this ability may contribute to poor community functioning. Further research is warranted to investigate whether skills training in emotion regulation could improve outcomes among individuals with ABI.
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Personality Changes Following Surgery of Aneurism of Brain Arteries
Ana Havelka Mestrovic, Ljiljana Pacic Turk, Diana Pesy
Objective: Neuropsychological testing of patients in the course of their recovery from brain injuries enables the analysis of cognitive deficiencies and/or emotional changes. The principle study objective was to define organic and/or reactive personality changes and the course of these changes in the function time span following surgery of brain artery aneurism in both female and male patients.
Participants and Methods: The study was carried out at the Clinic of Neurosurgery of Zagreb Clinical Hospital Centre. The data refer to the period from 1992 to 2014 collected in two time intervals, i.e. 11 months and 12-48 months following brain artery aneurism surgery. Of 92 patients included in the study there were 38 males and 54 females. Neuropsychological testing consisted of clinical interview, clinical assessment of frontal syndrome and Cornell Personality Questionnaire and Emotional Index Profile.
Results: The study results show evidence of frontal syndrome in 32% of patients in first testing and significant recovery in retesting, when only 17% of patients presented with frontal syndrome. The reactive personality changes found in both testing intervals indicate increased neuroticism. The results also show higher depressive and disorganizing states, which were even more expressed during the second testing. Cardiovascular somatisation and aggressiveness was more expressed in females than in males showing the tendency of aggravation with increased time span following surgery.
Conclusions: It may be concluded that the study has contributed to better understanding of organic and/or reactive personality changes in patients undergoing surgery for aneurysm of brain arteries.
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It's PTA Jim, but not as we know it
Maria Hennessy, Laurence Marshman, Lorryn delle Baite, Jessica McLellan, Grace Britton
Objective: Following emergence from coma, the stage of recovery following a traumatic brain injury (TBI) is known as post-traumatic amnesia (PTA). However, this clinical term is a potential misnomer for a diverse range of behavioural and cognitive impairment; and commonly used PTA tests do not adequately assess this clinical complexity. The aim of this study was to pilot a new measure for this stage of TBI recovery.
Participants and Methods: Participants included 20 patients with moderate to severe TBI who were in PTA; and 16 matched controls with TBI no longer in PTA. All were consecutive admissions to the Townsville Hospital and community rehabilitation. Participants were administered the Westmead PTA scale, the GOAT, the Agitated Behaviour Scale, and a new measure: the Comprehensive Assessment of Recovery after TBI (CART).
Results: Significantly poorer performance was found for the PTA group on the CART category fluency, digit span, visual learning, and verbal comprehension. No significant differences were found for the CART processing speed, verbal learning, visual perception and metacognition. The CART also identified significant behavioural differences between the groups for inattention, sleep disturbance, daytime sleepiness, self-monitoring, impulsivity, self-stimulating behaviour, and restlessness.
Conclusions: The conceptualization and measurement of PTA should be revised to reflect the clinical complexity of this stage of recovery post-TBI. Preliminary results for the CART as a cognitive and behavioural screen are promising and require further validation with larger samples. Additionally the impact of antipsychotic and opioid administration during this stage of recovery requires further investigation.
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Neuropsychological performance after EC-IC bypass surgery – preliminary results
Lenka Kramska, Jan Sroubek, Martin Kovar, Zuzana Jarosova
Objective: The aim of the study is to assess cognitive performance of patients treated by extra-intracranial (EC-IC) bypass surgery for cerebral ischemia.
Methods: Between November 2013 and October 2015 we neuropsychologically evaluated 11 patients demonstrating hemodynamic insufficiency following internal carotid artery (ICA) occlusion. Nine of them completed neuropsychological testing before and 6 months after EC-IC bypass. We compared RBANS Index Scores and Verbal fluency scores before and after intervention. All patients underwent standard preoperative neurological and radiological evaluation.
Results: In our preliminary results we found improvement after EC-IC bypass in following domains: Immediate memory (p = .012), Visuospatial/Constructional (p = .028), Language (p = .018), Delayed Memory (p = .036), Total Scale (p = .008) and Verbal Fluency Test (p = .028).
Conclusions: Many patients indicated for EC-IC bypass due to ICA occlusion and hemodynamic insufficiency are affected by significant cognitive impairment. In accordance with other scientific studies neuropsychological performance can significantly improve after EC-IC bypass surgery.
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Anterograde Amnesia with Perserved Recognition: A Case Study of a Bilateral Fornix Stroke
Adriana Leveroni, Laia Costa, Sol Fernandez-Gonzalo, Jordi Estela, Merce Jodar,
Objective: Bilateral fornix injuries are rare in clinical practice and there is scarce scientific literature about this isolated brain damage. Fornix involves efferent fibers from hippocampus to the mammillary bodies and anterior thalamic nuclei, connecting structures implicated in processing and storing memory. The aim of the present study is to show the memory profile of a patient with a isolated bilateral fornix injury.
Participants and Methods: A 49-year-old right handed male with a bilateral fornix ischemic stroke was assessed. Neurological, neuropsychological and a neuroimaging study (MRI) were carried out. The neuropsychological assessment included orientation, memory, attention, and executive functions. After two months, a *retest* assessment was administered.
Results: The MRI revealed an ischemic acute stroke affecting the left subcallosal artery and bilateral anterior trigonal infarct. No signs of neurological sequelae were present at the moment of neuropsychological assessment. Significant memory impairment with a severe alteration on delayed recall (T=23) and slight improvement on recognition (T=27) were found. Verbal and visual memory were equal affected with similar pattern of alteration. Performance in attention (T=65), processing speed (T=63) and executive functions (T=63) were normal. On the 2 months follow-up visit, the amnesic syndrome was still present (mild improvement) with a learning and short/long term altered recall (T=40) but with completely normal recognition (T=43).
Conclusions: Some visual and verbal memory aspect, such as recognition, seem to be preserved after bilateral fornix damage. However, this is a severe amnesic syndrome, which affects retrieval more than the storing information process.
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Effective Learning after Acquired Brain Injury: A practical guide to support adults with neurological conditions: Neuropsychological Assessments leading to cognitive profiles to inform individual education plans.
Graham Lowings, Beth Wicks
Objectives: Collaboration in 2010 between a clinical neuropsychologist and an education consultant, the co-author of Educating Children after Acquired Brain Injury (ABI) (2005) led to discussions around the utility of adapting some of the concepts detailed in the above book into a series of processes to help adults with ABI to learn.
Participants and Methods: Inspired by the research into the effects of ABI and in particular the number of persons with ABI who are incarcerated within the criminal justice system and secure hospitals in the UK and abroad, in 2012 the paper, “The need for cognitive profiles based on neuropsychological assessments to drive individual education plans (IEPs) in forensic settings” was published. This paper provided a template for the authors’ ideas. Over the next three years, further research and drafting was undertaken to operationalize the ideas into a resource. Although the original target audience was within forensic settings, it soon became apparent that the resource

would be useful for all who support adults to learn and to overcome their ABI.
Results: In January 2016 these ideas became a reality with the publication of the book, “Educating Adults with Acquired Brain Injury”. Contents includes: Understanding ABI, neuropsychological assessments and the use of cognitive profiles to construct Individual Education Plans (IEP). Strategies to address deficits and improve learning and manage behaviours are discussed. Evaluation proforma.
Conclusion: Now that the resource is publically available, the authors would like to encourage and invite research trials of the techniques suggested.
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Does Apolipoprotein ε4 interact with age or sex in cognitive function after traumatic brain injury?
Christine Padgett, Mathew Summers, Cynthia Honan, Graeme McCormack, James Vickers, Clive Skilbeck,
Objective: The APOE ε4 allele has been associated poorer cognitive function following traumatic brain injury, however evidence to date has proven equivocal. The aim of this study was to investigate the impact of APOE ε4 on cognitive function following traumatic brain injury, and to explore the influence of age and sex on the impact of APOE ε4 versus the most common APOE allele; ε3.
Participants and Methods: Participants with traumatic brain injury were genotyped to determine APOE status and APOE ε4 and APOE ε3 carriers were assessed using a battery of cognitive tasks measuring executive function, working memory, and processing speed at 3, 6 and 12 months post-injury.
Results: Mixed modelling revealed that APOE ε4 carriers performed worse than the APOE ε3 group on only two of seven tasks (Trail Making Task B at 6 months, and the Controlled Oral Word Association Task), and therefore possession of APOE ε4 did not appear to systematically impair cognitive function. There was no evidence of interactions between age and APOE ε4, or sex and APOE ε4.
Conclusions: Our findings indicate that the APOE gene is unlikely to significantly impact on cognitive function following traumatic brain injury, and that neither age nor sex interact with APOE ε4 in this population. While the injury and demographic characteristics of our sample were reflective of the broader TBI population, further examination of these relationships in moderate to severe samples may be warranted.
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Social support and occupational aspects of adults after stroke
Luciana Trad, Ana Paula Pereira, Makilim Batista
Abstract: The present study aimed to analyze the relationship between social support perception and occupational aspects of young adults after stroke. A cross-sectional design was adopted. A social support scale (Escala de Percepção de Suporte Social for adults by Cardoso & Baptista, 2013, EPSUS-A) and a demographic questionnaire were used to assess variables. The 36 item scale aims to assess social relationships as a source of affection, social interactions, assistance with personal care and problem solving skills using a likert scale. A descriptive and a correlational statistical analysis were performed. A total of 20 adults, aged 18 to 45 years with a diagnosis of stroke participated, 65% were women, the mean age was 37,6 years, and education mean was 9,35 years. Results showed that the sample perceived positive social support after stroke. Ninety percent of participants were working before the stroke but after only 30% had returned to work. The majority of participants had technical jobs and were liberal professional before stroke. In the sample, returning to work was related to higher education. There was a significant relation between return to work and perceived social support. Results suggested that assessment of social support could be a useful tool to identify people with difficulties to return to work.
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Subjective endorsement of cognitive postconcussional symptoms in a cohort of mild TBI patients. A pilot study
Andreea Rădoi, Victoria Cañas, José Mauricio Cevallos, Darío Gándara Sabatini, Noelia Montoya, Maria A. Poca, Juan Sahuquillo
Objective: To investigate the relationship between subjective endorsement of cognitive postconcussional symptoms in patients with mild traumatic brain injury (mTBI) and clinical, sociodemographic and neuropsychological findings.
Participants and Methods: Prospective study in which 50 adult patients attended to at a tertiary trauma center in the first 24h after a mTBI were included. Exclusion criteria were: abnormal CT scan, polytrauma requiring hospitalization, history of psychiatric/neurological disorders, previous TBI, chronic substance abuse and not being fluent in Spanish/Catalan. Healthy volunteers (n=18) who fulfilled similar criteria were included. Patients were evaluated using the *Sport Concussion Assessment Tool 2 (SCAT-2)* within the first 24h after injury and 1week and 3months afterwards. A comprehensive neuropsychological battery (including verbal/visual memory, processing speed, working memory and other executive functioning tests) was applied. Serum S100β levels were determined within the first 24h after injury.
Results: 32 out of 50 patients reported cognitive symptoms in the first 24h and at 1 week after injury. In 10 cases symptoms persisted at 3 months. The acute subjective severity of the symptoms was an independent predictor for behavioral impulsivity at 1 week, in a multivariate model controlling for age and educational level. No other clinical or neuropsychological variables were significantly related to the subjective complaints.
Conclusions: Patients who endorsed cognitive symptoms in the SCAT-2 after concussion were frequent. However, this endorsement was not a significant predictor for the objective cognitive functioning at 1 week and 3 months after injury, when analysed together with patients without self-perceived cognitive problems and with healthy volunteers.
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Comparing semantic autobiographical memory performance in and out of post-traumatic amnesia
Caroline Roberts, Gershon Spitz, Matthew Mundy, Jennie Ponsford,
Objective: Observations of ‘shrinking retrograde amnesia' following traumatic brain injury (TBI) date back to the late 1800s, yet there have been no published longitudinal studies using an objective measure to compare semantic autobiographical memory (AM) within the same participants in and out of post-traumatic amnesia (PTA). The purpose of this study was to establish whether a negative gradient (relative preservation of childhood memories over more recent lifetime periods) exists in PTA and its association with demographic and injury-related variables. This has implications for predicting recovery, understanding the relationship between anterograde and retrograde amnesia during PTA, and theories of memory consolidation.
Participants and methods: 14 patients with TBI monitored using the Westmead Post-Traumatic Amnesia Scale were administered the Personal Semantic Schedule of the Autobiographical Memory Interview on a single occasion whilst in PTA and within two weeks of emergence. Change in semantic AM with PTA status across Childhood, Early Adult and Recent lifetime periods was analysed using Random Effects Regression.
Results: Semantic AM was significantly lower in PTA than out of PTA (overall and within each time period) ($p < .001$). There was a significant trend whereby those who took fewer days to emerge post-interview scored better overall and showed greater preservation of Childhood memories.
Conclusions: Whilst semantic AM was significantly impaired in PTA compared to out of PTA, these preliminary findings suggest that the presence of a negative gradient in PTA may depend on injury-related variables, with those taking longer to emerge showing more global impairment across all lifetime periods.
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mTBI patients "at-risk" of suffering from persisting complaints: the role of coping, mood disorders and post-traumatic stress
Myrthe Scheenen, Jacoba Spikman, Myrthe de Koning, Harm van der Horn, Gerwin Roks, Gerard Hageman, Joukje van der Naalt
Objective: A minority (15-25%) of mTBI patients develop persisting post-concussive complaints (PCC) that interfere with resumption of previous activities. Early identification of patients at-risk for PCC is currently performed by measuring the number of complaints in the acute phase. However, only part of this group will actually develop

persisting complaints, stressing the need for studies on additional risk factors. This study aimed to describe the characteristics of this group of patients with many complaints and compare them to patients with few and no complaints to identify potential additional discriminating characteristics.
Participants and methods: We included 820 mild TBI patients (Glasgow Coma Scale [GCS] score 13-15) admitted to the emergency department of three level 1 trauma centers as part of the UPFRONT-study. Patients received a questionnaire two weeks post-injury covering complaints, mood, PTSD and coping styles.
Results: At two weeks after injury, 60% reported no complaints (PCC-zero), 25% reported few (PCC-low) and 15% had no complaints (PCC-zero). Results showed that PCC-high consisted of more females, were more likely to have a psychiatric history and had a higher number of reported depression, anxiety and post-traumatic stress (P<.001) than the PCC-low and PCC-zero groups. In PCC-high, more patients scored high on passive coping when compared to PCC-zero, in which a large proportion of patients scored low on passive coping (p=.006).
Conclusions: We conclude that in addition to reported complaints, depression, anxiety and post-traumatic stress s symptoms should be taken into account in the identification of at risk patients for future treatment studies.
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Discrimination Thresholds for Recognizing Facial Emotions in Patients with Traumatic Brain Injury
Mitsuyo Shibasaki, Sayoko Yamamoto, Fumiko Anzaki, Hiroshi Yoshida, Masako Fujii,
Objective: Previous studies have shown that patients with traumatic brain injury (TBI) often experience difficulties in recognizing facial emotions in others. To explore the nature of the difficulties, we assessed TBI patients' discrimination thresholds for recognizing six basic facial emotions using a psychophysical measurement method.
Participants and Methods: Eleven severe TBI patients (aged 41.1 ±9.2 years) and sixteen age-matched healthy adults (aged 40.2 ±9.2 years) participated in this study. The participants were presented with morphed photographs of facial expressions with varying emotional intensities of six facial emotions and were asked to classify these photographs using linguistic labels. The discrimination threshold value for each facial emotion was obtained by the staircase method. Furthermore, Pearson correlations between the threshold values for the facial emotions, Behavioural Assessment of the Dysexecutive Syndrome (BADS) standard age scores, Dysexecutive Questionnaire (DEX) self-rating and proxy-rating scores and the difference score (DEX-proxy score minus DEX-self score), and the Rivermead Behavioural Memory Test (RBMT) standardized profile score were calculated.
Results: The threshold values for anger, disgust, and fear were significantly higher for TBI patients than for normal participants. In addition, there were relatively strong positive correlations between the threshold values for happiness and DEX-proxy scores and between those for disgust and DEX-difference scores.
Conclusions: The results suggest that discrimination sensitivity to facial emotions is affected by TBI. Moreover, the reduction of sensitivity to facial emotions might be associated with behavioral problems and impaired self-awareness in TBI patients.
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Decision-making after aneurysmal subarachnoid haemorrhage
Anna Suades, Gemma Escartin, Sonia Aixut, Maria Angels de Miquel, Andreu Gabarrós, Montserrat Juncadella
Objective: To evaluate decision-making after aneurysmal subarachnoid hemorrhage (aSAH). **Participants and methods**: We examined 77 patients with aSAH with a favorable neurological outcome. Forty patients had anterior communicating artery aneurysm (ACoA) and thirty-seven had another aneurysm location (non-ACoA). Patients were also divided depending on the treatment modality (clipping or coiling) and infarction location. Thirty-one matched controls were examined as well. Decision-making was assessed by the Iowa Gambling Task (IGT).
Results: SAH patients performed significantly worse on the IGT than controls. Non-ACoA patients did not differ significantly from controls, whereas ACoA patients performed significantly worse than controls. Clipped patients did not differ significantly from coiled patients, although coiled patients performed worse than controls on the last block of the task. Patients with frontal lesions performed significantly worse than controls, while patients without frontal lesion did not differ significantly from controls.
Conclusions: SAH patients have deficits in decision-making on the IGT. The presence of frontal lesions is a relevant clinical factor. This variable could explain the greater difficulty of ACoA patients in comparison to non-ACoA patients on the IGT. There are minimal differences in the decision-making performance between endovascular coiling and surgical clipping.
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The impacts of "Diagnosis Threat" on neuropsychological assessment outcomes in individuals receiving clinical services for Traumatic Brain Injury
Eleanor Williams, Patrick Vesey, Rob Stephens, Shirley Thomas
Objective: Recent research has begun to demonstrate the confounding effects of diagnosis threat on neuropsychological assessment outcomes. Specifically, studies suggest that when individuals are informed that they may experience cognitive difficulties, they demonstrate performance impairment on cognitive tests. However, this effect is not consistently demonstrated across the literature, possibly due to the use of samples that do not comprise a true vulnerability to diagnosis threat. We therefore aimed to investigate diagnosis threat in a clinically relevant sample.
Participants and Method: The current study examined the effect of diagnosis threat on neuropsychological test performance and engagement. Seventeen service users with brain injury completed either the WAIS-III Digit Span or WAIS-III Spatial Span sub-test test twice under baseline conditions (diagnosis threat not manipulated in either attempt). Participants completed the remaining span test twice under experimental conditions (baseline conditions in the first attempt, diagnosis threat manipulated in the second attempt). Each attempt at each test was followed by a corresponding effort questionnaire.
Results: In the baseline condition, performances significantly improved at the second attempt at the tests and effort scores did not significantly differ. In the experimental condition, a trend towards performance impairment and significantly lower effort scores occurred following exposure to diagnosis threat.
Conclusion: Clinicians should be attuned to diagnosis threat when administrating neuropsychological tests and interpreting findings. Standardised measurements of effort could serve as an indicator of results affected by diagnosis threat.
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The Role of Valued Living following Traumatic Brain Injury
Celia Pais, Dana Wong, Kate R. Gould, Jennie Ponsford
Objective: Values are personally chosen life directions that guide and reinforce behavior. Value consistent living or valued living is associated with increased psychological adjustment, acceptance of discomfort, decreased psychological distress, and improved quality of life. Traumatic brain injury (TBI) may impair an individual's ability to set appropriate and achievable goals consistent with their values. Understanding the role of valued living post-TBI may assist clinicians to facilitate post-injury adjustment. The aim of this study was to determine the factors associated with valued living following moderate to severe TBI.
Participants and Method: Value consistent living was assessed by the Valued Living Questionnaire (VLQ). Measures of demographics, injury severity, psychiatric disorders, psychiatric symptomatology, functional adjustment and changes in outlook were also collected. The sample included participants assessed 3-6 months post-injury to determine pre-injury variables and followed up at 12 months (n= 25). The sample also included participants assessed cross-sectionally 12-72 months post-injury (n= 48).
Results: Individuals with higher levels of valued living reported greater functional adjustment and lower levels of anxiety, depression and negative outlook on life post-injury. Compared with pre-injury estimates, there was a significant reduction in valued living 12 months post-injury which was associated with increased anxiety and depression.

Conclusions: Value consistent living is associated with improved outcome after TBI. Potentially, post-injury adjustment could be facilitated by supporting individuals to identify their values, set value consistent goals, and work towards achieving these. Further research is required to understand reasons for reduced valued living and identify individuals likely to benefit from intervention.
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A follow-up investigation of work quality in patients with mild traumatic brain injury: Relationships between post-concussion symptoms, work status and work stability
Shao Ying Chu, Yi Hsin Tsai, Sheng Huang Hsiao, Sheng Jean Huang, Chi Cheng Yang
Objective: Post-concussion symptoms (PCS) are not uncommon following mild traumatic brain injury (MTBI). Although researchers have indicated that 'return to work' (RTW) is one of the most important outcome measures for patients with MTBI, methodological drawbacks still weakened its representativeness. The current study thus aims to evaluate the 'work quality' (WQ) defined simultaneously by "work status" and "work stability", and further to explore the relationship between PCS and WQ.
Participants and Methods: This is a prospective study with 136 patients with MTBI and 47 healthy participants. To understand the WQ, patients were subdivided into rapid return to work (R-RTW) and delayed return to work (D-RTW) by the time of returning to work place. Three working groups (manual laboring, skilled, or professional) were also identified. Patients were evaluated for their PCS and WQ at 2 weeks, 1 month and 3 months after MTBI.
Results: No significant difference between R-RTW and D-RTW on the WQ was found at 3 months post-injury, and neither of significant difference on the WQ between working groups was revealed. Despite 1 or 3 months post-injury, PCS reported by patients with favorable WQ were significantly lower than patients with unfavorable WQ. In addition, WQ at 3 months post-injury could be predicted by emotional symptoms at 1 month post-injury.
Conclusions: This might be the first study to comprehensively examine WQ after MTBI, and further identify predictors of WQ. It thus merits that clinicans provide interventions on emotional symptoms at 1 month post-injury for reassuring patient's favorable WQ.
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Social cognition abilities following traumatic brain injury: The assessment of emotion expression and theory of mind
Zai-Ting Yeh, Yu-Chi Liu, Ming-Dar Tsai, Ming-Cheng Tsai
Objective: This study focused on patients with traumatic brain injury, as an attempt in finding their performances on diverse domains of social cognition abilities, and as a reference for future assessments and planning of rehabilitation.
Methods: 23 patients with traumatic brain injury were paired with 22 healthy people, as control group, in age (*M*=37.2 ; *M*=36.64), gender, and level of education. All participants completed the cognitive function tests and social congition tasks including the Florida affect battery test, the awareness of social inference test, the advance theory of mind task, and a self-report social intelligence scales.
Results: The result shows that TBI patients performed significantly worse than the control group in the performance of multiple tasks related to social cognition, with possible difficulties in emotion recognition and theory of mind. The performances are especially poor in the recognition of negative emotion and the reasoning in sarcastic scenario.
Conclusion: Despite the post-injury damage in social cognition abilities, the self-report social intelligence scales shows no significant differences between the TBI group and the matched group, as two tests are significantly negatively correlated, which implies that despite the patients' own assumption of being free from social behavior problems, they might still be inflicted with impairment in social cognition.
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Acquired Brain Injury, including TBI/Cerebrovascular Injury and Disease (Child) - Poster Session 5 - 08.30 - 10.30		
Number	**Presenter**	**Poster Title**
26	Rachael Elward	Emergence of motor and cognitive deficits in infants with transposition of the great arteries
27	Ingram Wright	Evolution of post-concussion symptoms in a consecutive sample of children presenting to the emergency department
28	Louise Owen	The Development of a self-harm pathway for assessing and supporting children and young people with acquired brain injury in a paediatric residential neurorehabilitation service.
29	Christianne Laliberté	Effect of the home environment on long-term executive functioning following early childhood traumatic brain injury
30	Janet Leathem	An examination of concussion symptom base rates in children aged 5-18 years
31	Steve Mahan	A systematic review of psychological interventions to rehabilitate prospective memory deficits as a consequence of acquired brain injury
32	Phil Yates	"We knew our lives were changed forever from that point" - Parental Adjustment and the role of social support in paediatric acquired brain injury: An interpretative phenomenological analysis

Emergence of Motor and Cognitive Deficits in Infants with Transposition of the Great Arteries
Rachael Elward, Maneet Saini, Michelle De Haan, Faraneh Vargha-Khadem
Abstract: Neonates with transposition of the great arteries (TGA) corrected with the arterial switch operation (ASO) suffer significant cyanosis shortly after birth and thus are potentially at risk of hypoxic/ischaemic-induced brain injury. TGA has been associated with motor deficits, cognitive impairment and increased incidence of psychiatric diagnoses in children and adolescents. These deficits likely stem from damage sustained in the neonatal period. We conducted a prospective longitudinal study to track motor and cognitive development of a cohort of infants with corrected TGA (N = 23) in relation to a cohort of healthy infants (N = 24). Participants underwent a structural MRI examination (mean age at scan = 12.5 weeks for TGA, and 11.6 weeks for controls), and a neurodevelopmental assessment using the Bayley Scales of Infant Development (including cognitive, language and motor scales) at 6 months and 12 months. At both time-points, a Group X Scale ANOVA was conducted and both were significant ($p < 0.025$). At six months, the TGA group scored significantly lower than controls only on the motor scales ($p < 0.001$). At 12 months, the TGA group not only maintained the motor impairment ($p < 0.01$), but also showed a significant deficit in cognitive development relative to controls ($p < 0.001$). We conclude that infants with corrected TGA exhibit significant motor and cognitive delays within the first months of life, possibly as a consequence of hypoxic-ischaemic events experienced during the perinatal period.
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Evolution of post-concussion symptoms in a consecutive sample of children presenting to the Emergency Department
Declan Heaslewood, Abigail Croker, Isabel Avery, Ingram Wright, Mark Lyttle
Objective: Adverse outcomes following mild traumatic brain injury are widely recognised in adult and also reported in up to 30% of children following mild traumatic brain injury [Eisenberg, 2014]. Typical initial symptoms include headache and dizziness evolving into fatigue and poor concentration which dominate at >4 weeks post injury. The reported prevalence of these symptoms is particularly sensitive to local parental expectations and general levels of concerns on the basis of treatment and information provided in the Emergency Department (ED). In addition, community and cultural perspectives on injury severity and symptom presentation influence the trajectory of recovery.
Participants and Methods: This study reports the prevalence of symptomatology at 6 weeks following mild TBI in a sample of children seen in the ED at Bristol Children's Hospital. A telephone survey utilised the Post-concussion symptom inventory at 4-6 weeks

following discharge from ED in a sample of 40 children with Mild TBI. We present data on the prevalence of specific medical symptoms (fatigue, headaches, dizziness) alongside cognitive/behavioural symptoms (slow thinking, memory & attentional problems) and successful reintegration into school, home and leisure activities.
Results and conclusions: We compare the prevalence of concussion symptoms in the UK population with prevalence studies in the US and comment on cultural and psychosocial influences on distinct symptom evolution. We present conclusions on the information needs of parents and guidance on symptom management and access to services.
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The Development of a Self Harm Pathway for assessing and supporting children and young people with acquired brain injury in a paediatric residential neurorehabilitation service
Rachel Ames, Cath Jones, Louise Owen
Objective: The pathway was developed to provide a framework for assessing the risks relating to self harm in children and young people with an acquired brain injury. This was developed based on NICE guidelines and aims to assess the risks that relate to the young person's emotional state and the risks that relate to their acquired brain injury. The aim was to develop a framework for collaborative working wih the child or young person and with their family.
Participants and Methods: The pathway was developed based on clinical experience with children and young people who were at risk of self harming and drew on the NICE guidelines for self harm. An assessment tool was developed using "Talking Mats" for use with children and young people with cognitive and communication difficulties.
Results: The pathway has been used with 6 children and young people who were at risk of self harming. An assessment framework has been developed with a risk matrix for both mental health risks and ABI risks. A "Talking Mats" assessment has been developed to assess children and young people's emotional state and their thoughts and feelings in relation to self harm.
Conclusions: The pathway provides a framework for assessing risks relating to self harm in children and young people with an acquired brain injury. It also provides a framework for working collaboratively with the child, young person and their family to identify risks and resilience factors and to plan with them to reduce the risks.
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Effect of the home environment on long-term executive functioning following early childhood traumatic brain injury
Christianne D. Laliberté, Keith O. Yeates, Terry Stancin, H. Gerry Taylor, Nicolay C. Walz, Shari L. Wade
Objective: This study examined the effect of the early and late home environment on long-term executive functioning (EF) following early childhood traumatic brain injury (TBI).
Participants and Methods: Children, ages 3-7 years (N=206), hospitalized for severe TBI (n= 23), complicated mild/moderate TBI (n= 64), or OI (n= 119) were recruited prospectively from four tertiary care hospitals in the United States. Participants were followed up an average of 6.7 years post-injury. Quality of the home environment, caregiver psychological distress, and general family functioning were assessed shortly after injury and at long-term follow-up. At the long-term follow-up, participants also completed several measures of EF (Tower of London, Test of Everyday Attention for Children (TEA-Ch), Attention Network Task, Iowa Gambling Task). Hierarchical regression analyses examined the effect of both the early and late home environment measures on EF, both as main effects and as moderators of group differences.
Results: The early home environment was a consistent predictor of long-term EF across groups. Few overall group differences in EF were significant (only on the TEA-Ch Walk-Don't Walk subtest), but several interactions between group membership and home environment measures suggested that group differences were moderated by the environment, especially for children with complicated mild/moderate TBI.
Conclusions: The early home environment has a major influence on long-term EF in children with TBI and OI, and may moderate the effects of TBI on EF. These effects may be more pronounced in those with complicated mild/moderate TBI.
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An Examination of Concussion Symptom Base Rates in Children Aged 5-18 Years
Mary Millar, Janet Leathem
Objective: To establish base rate levels of symptoms that are commonly associated with mild traumatic brain injury in healthy children aged 5 to 18 years. Previous research by Couch and Leathem (2011) with healthy children aged 11 to 13 years had found high base rate levels of symptoms, while Gioia, Janusz and Isquith (2008) reported that base rates were low, when measured on the post-concussion symptom inventory (PCSI). This study sought to enquire into the discrepancy in previous findings, through examining the effects of: parental compared to self-report; single compared to profile scores; severity; time; and differences due to demographic factors.
Participants & Method: For the current research a questionnaire was developed that included questions used in the aforementioned previous research to enable comparison of results and methodologies. Questions gathering demographic information were also included so that any differences in reported base rates between groups could be explored.
Results: Base rates were found to be significantly lower than those reported by Couch and Leathem (2011) while post-concussion symptom inventory (PCSI) scores were higher than those found by Gioia et al. (2008). No significant difference was reported for total positive symptom frequencies for age, gender or location, or between who had sustained concussion and those who had not. Some significant differences were found for individual symptoms.
Conclusions: Base rates may be useful in guiding clinical assessment of brain injuries in children, although different methodological approaches can affect the level of reported base rate.
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A Systematic Review of Psychological Interventions to Rehabilitate Prospective Memory Deficits as a Consequence of Acquired Brain Injury
Steve Mahan, Rebecca Rous, Anna Adlam
Objective: Prospective memory (PM) impairments are common following acquired brain injury (ABI). This systematic literature review aimed to examine the rehabilitation approaches for PM impairments as a consequence of ABI in both adults and children, to establish the interventions that are available or could be adapted to support children with these deficits.
Participants and Methods: Relevant literature was identified using PsycARTICLES (1894 - present), PsycINFO (1880 - present), the Cochrane Library (1972 - present), and MEDLINE PubMed, and searches on selected references from relevant journal articles. Literature searches were conducted using variants of the terms *brain injury*, *stroke, encephalitis, meningitis*, and *tumour*, combined with variants of the terms *rehabilitation* and *prospective memory.* Peer-reviewed journal articles were included. A data extraction sheet was developed based on Cochrane Consumers and Communication Review Group.
Results: Eleven relevant papers were reviewed. Interventions included compensatory strategies using external memory aids, which provide either content-specific or content-free cueing, and remediation strategies using meta-cognitive training programmes aimed at improving self-monitoring and self-evaluation of personal goals. Risk of bias and the strengths and limitations for individual studies was considered.
Conclusions: PM abilities can be improved by utilising simple reminder systems and interventions utilised with adults can be effective; however, paediatric rehabilitation needs to consider on-going cognitive maturation. External strategies aimed to facilitate PM task performance can be generalised to facilitate everyday PM functioning. There is a lack of research on PM interventions for children with ABI, and future research is needed to improve this evidence base.
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"We knew our lives were changed forever from that point". Parental Adjustment and the Role of Social Support in

Paediatric Acquired Brain Injury: An Interpretative Phenomenological Analysis
Sian Hocking, Phil Yates, Anna Adlam
Objective: Paediatric acquired brain injury (pABI) can lead to an array of long term physical, cognitive, emotional, and behavioural difficulties. Due to the long-term sequelae of more severe pABI, it presents a significant challenge to the child's family. Studies have suggested that social support can positively impact psychological adjustment following a stressful life event, and can aid personal resilience. There remains limited qualitative investigation of subjective family and parental adjustment experiences following pABI. Researchers have argued for future research that include the experiences of parents who have children younger than 16 years old, and are able to shed light on the individual experiential journey of parents**.** The current study used interpretative phenomenological analysis (IPA) to explore the experiences of adjustment and social support of parents of children with pABI.
Participants and Methods: Purposive sampling was used to recruit 10 participants who were individually interviewed.
Results: Five superordinate themes emerging from the data were identified: 1) Lives changed forever, 2) Sense of self, 3) Interaction with services, 4) The psychological experience, 5) Coping and adjustment.
Conclusions: The findings suggested that psychological defence mechanisms, personal resilience and characteristics, cognitive strategies, and support from others all played a role in facilitating the adjustment of parents. However, social support was not a consistent facilitator of coping amongst the participants in this study. Relevant literature and implications for future research and clinical practice will be discussed.
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Psychopathology/Neuropsychiatry (Including Schizophrenia) - Poster Session 5 - 08.30 - 10.30		
Number	**Presenter**	**Poster Title**
33	Michela Balconi	Emotion regulation in schizophrenia: Neurofeedback applications as assessed by EEG and optical imaging
34	Silvia Cámara-Barrio	Influence of education on cognitive and functional performance in patients with schizophrenia
35	Judith Duijkers	Executive functioning in dual-diagnosis
36	Caroline East-Richard	Methodological quality and clinical relevance of meta-analyses on cognitive deficits in psychiatry: a systematic review
37	Peter Gallagher	Neurocognitive intra-individual variability in mood disorders: effect on attentional response time distributions
38	Evgenia Gkintoni	Cognitive endophenotypes of affective and non-affective psychosis
39	Julia Jeschke	Evaluation of the efficacy of sociocognitive and neurocognitive training dedicated for patients with anorexia nervosa
40	Mie Matsui	Corpus callosum morphology in patients with first-episode schizophrenia: association with negative symptoms
41	Guillem Navarra	Social cognition in early phases of psychosis: A case-control study of gender-related differences
(42)	Dung Pham	PRESENTATION WITHDRAWN: Neural correlates of antidepressant treatment response in adolescents with major depressive disorder
43	Alexandra Mercier	Common transdiagnostic cognitive deficits among people with psychiatric disorders exposed to childhood maltreatment: A systematic review
44	Laura Smith	The neuropsychiatric sequelae of vestibular disorders
45	Sara Weisenbach	The double burden of age and disease on cognition and its underlying neural circuitry in major depressive disorder
46	Fenny	Is implicit learning intact in autism?
	Zwart	Behavioral and ERP results from a statistical learning task

Emotion regulation in Schizophrenia. Neurofeedback applications as assessed by EEG and optical imaging
Michela Balconi, Maria Elide Vanutelli
Objectives: Research on Schizophrenia (S) revealed abnormal electroencephalographic activity (EEG) in schizophrenic patients and anomalies in brain responsiveness, as revealed by neuroimaging measures. However, no integration of these methods is usually applied to test the emotional deficit in S. The present pilot study applied Neurofeedback (NF) technique to restore the "unbalance cortical activity" in S in response to emotional stimuli, and applied functional near-infrared spectroscopy (fNIRS) and EEG co-registration to analize: a) the initial (T0) anomalous prefrontal activity (main delta band); b) the NF application during a training protocol of five weeks (T1); c) the NF efficacy in term of balanced cortical activity (T2).
Participants and methods: 8 patients have been randomly assigned to either control (3 patients, C), or neurofeedback group (5 patients, N).
Results: The initial evidence of an unbalanced prefrontal activity within the left/right hemisphere (higher delta) was verified in T0. Nevertheless, no anomalous behavior was observed in S about the explicit evaluation about stimuli emotional valence.
Conclusions: NF treatment effect in T2 was observed for N group in comparison with C group: indeed in T2 the anomalous responsiveness to emotional cues was modulated as shown by both EEG and fNIRS measures.
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Influence of education on cognitive and functional performance in patients with schizophrenia
Silvia Cámara-Barrio, Israel Contador, Francisco Ramos, Juan Jose Silva, Pablo Ruisoto, Inmaculada Herranz, Luis A. Cuéllar
Objective: The aim of this research is to analyze whether educational attainmentpredicts cognitive and functional scores in patients with schizophrenia.
Participants and Methods: A sample of 116 patients (Mean age = 40 ±9.62, 63% men) with diagnosis of schizophrenia (93 paranoid subtype and 23 other subtypes) was selected from consecutive referals to the Psychosocial Rehabilitation Center of Benito Menni Hospital (Valladolid, Northwest Spain). All participants completed an standardized protocol to assess cognitive and functional performance which consisted of K-Bit, Trail Making Test (TMT), stroop, verbal fluency , digits (forward and backward), digit symbol-coding, symbol search and the Health of the Nation Outcome Scale (HONOS). Multiple regression (MR) analyses were used to test the relationship between education and cognitive-functional scores after controlling the effect of age, sex and severity of the symptoms.
Results: Education showed a significant correlation (range = 0.17-0-28, p <.05) with cognitive scores (digits, speed processing, stroop, phonological and semantic fluency) and HONOS behavioural (r = -0.23) and clinical (r=-0.22) subscales. MR analysesindicated that education predicts significantly cognitive and functional scores, even when age, sex and clinical severity were introduced as covariates in the models. The highest explained variance was associated with verbal fluency and speed processing tasks.
Conclusions: Our findings suggest that higher levels of education ameliorates cognitive and functional impairment in patients with schizophrenia.
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Executive functioning in Dual-Diagnosis
Judith Duijkers, Constance Vissers, Jos Egger
Objectives: In mental health, the term dual-diagnosis (DD) is used for the co-occurrence of Substance Use Disorder (SUD: alcohol/drugs) with another mental disorder. These co-occurring disorders can have a shared cause, and can cause/intensify each other's expression. Forming a threat to health and society, DD is associated with relapses in addiction-related behaviour and a destructive lifestyle. This seems due to a failure to control impulses and to maintain adequate self-regulatory behaviour. Impaired executive functioning (EF) is taken as underlying factor for several

mental disorders. Studies on EF in dual-diagnosis are limited in amount and frequently methodological issues are encountered like unclear abstinence periods.
Participants and Methods: In the current study, 30 patients with DD (psychotic, mood, developmental, or personality disorder with SUD) and 30 healthy controls were examined, with comparable intelligence and age. Patients with DD were abstinent for 14.5 weeks on average.
Results: Preliminary results show delayed information processing-speed and impaired word-fluency for the DD group as compared to healthy controls. Furthermore, on other EF tasks involving inhibition (Approach-Avoidance/Stroop) patients with DD are impaired and a trend is present for impairment of shifting (a.o. Wisconsin Card Sorting Task). Remarkably, decision-making performance (a.o. Cambridge Gambling Task) does not differ compared to healthy controls.
Discussion: Patients with DD might not take sufficient time to utilize EF abilities. More research zooming into the diversity of EF is necessary to deepen insight and test findings. Detailed insight in the strengths-weaknesses profile can lead to tailored treatment indications, pointing out which aspects need training.
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Methodological quality and clinical relevance of meta-analyses on cognitive deficits in psychiatry: a systematic review
Caroline East-Richard, Alexandra R.-Mercier, Danielle Nadeau, Caroline Cellard
Objective: Several meta-analyses evaluating the impact of psychiatric disorders on neuropsychological functioning have been published but the methodological quality of these meta-analyses is still unknown. The main objective of this systematic review was to assess methodological quality of these meta-analyses in order to provide guidelines for clinical research and for clinicians about the valid inferences that can be drawn.
Methods: A literature search was conducted to identify all meta-analyses of cognitive deficits in psychiatry published between 1970 and 2015. There was no restriction for age and the following psychiatric disorders were considered: mood disorder, psychotic disorder, autism spectrum disorder, attention deficit hyperactivity disorder, anxiety disorder. Methodological quality assessment of these meta-analyses was done using the R-AMSTAR (Revised Assessment of Multiple Systematic Reviews), which provides a rating ranging from 11 to 44 points.
Results: A total of 106 meta-analyses were included. R-AMSTAR mean score was 23.28 points (SD= 3.78; range= 15-33), which indicates moderate quality. Few meta-analyses used guidelines such as PRISMA and MOOSE. Therefore, gold standards for meta-analyses are not often considered in research methodology and when reporting results.
Conclusions: Confidence about the quality and the clinical relevance of the conclusions in meta-analyses is essential since clinicians often based their practice on such evidence-based conclusions. Therefore, many important aspects such as publication bias and scientific quality of included studies should be considered when performing meta-analyses in order to draw valid conclusions in research and in clinical settings.
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Neurocognitive intra-individual variability in mood disorders: effect on attentional response time distributions
Peter Gallagher, Jeevan Barn, Andreas Finkelmeyer, Andy Bradley, Stuart Watson, Nicol Ferrier, Hamish McAllister-Williams
Objective: Impaired sustained attention is a frequently reported feature of major depressive disorder (MDD) and bipolar disorder (BD). The aim of the present study was to further explore the utility of characterising response time (RT) distributions from attentional tasks, to examine more precisely the profile and extent of attentional intra-individual variability (IIV) in mood disorders.
Participants and Methods: The Attentional Network Test (Fan J, et al. 2002. Journal of Cognitive Neuroscience, 14, 340-347) was administered to 100 healthy controls and 110 patients with a mood disorder (46 BD and 64 MDD patients). Measures of IIV, including individual standard deviation (iSD) and coefficient of variation (CoV), were derived for each participant. Ex-Gaussian (and Vincentile) analyses were used to characterise the RT distributions into three components: mu and sigma (mean and standard deviation of the Gaussian portion of the distribution) and tau (the 'slow tail' of the distribution).
Results: Compared to healthy controls, iSD was increased significantly in all patient samples. Ex-Gaussian modelling indicated a significant increase in tau in BD (Cohen's d=0.84, p<0.001), with an increase in mu (d=0.76, p<0.001), sigma (d=0.76, p<0.001) and tau (d=0.68, p <0.001) in depressed MDD patients compared to controls.
Conclusions: Increased cognitive variability may be a core feature of mood disorders. These data highlight the utility of applying measures of IIV to characterise neurocognitive variability and the great potential for future application.
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Cognitive endophenotypes of affective and non-affective psychosis
Evi Gkintoni, Eleftherios Pallis, Panos Bitsios, Stella Giakoumaki
Objective: Cognitive deficits are reliable endophenotypic markers of schizophrenia and bipolar disorder (BD). BD patients with history of psychosis perform poorly compared with BD patients without family history of psychosis in several cognitive domains, thus resembling schizophrenia patients. In this study, we examined the cognitive profile of unaffected first-degree relatives of patients with schizophrenia or BD with history of psychosis.
Participants and Methods: Participants were 66 unaffected first-degree relatives of schizophrenia patients (SUnR), 36 unaffected first-degree relatives of BD patients with history of psychosis (BDUnR) and 102 age-, sex- and education-matched controls. They were tested for cognitive function and general psychopathology.
Results: The SUnR group had higher Depression and Somatization and the BDUnR group had higher Anxiety compared with the controls (all P values <0.005). After taking into consideration the differences in psychopathology, we found that both relatives' groups performed poorly compared with the controls in visual memory, control inhibition, working memory, cognitive flexibility and abstract reasoning (all P values <0.005). Only the SUnR group had poorer verbal fluency compared with the controls (P<0.001) and they also performed worse than the BDUnR group in visual memory and processing speed (all P values <0.01).
Conclusions: Control inhibition, working memory, cognitive flexibility and abstract reasoning are reliable endophenotypic markers of affective and non-affective psychoses as both relatives' groups were equally impaired in these cognitive domains. Visual memory, verbal fluency and processing speed deficits are more specific to schizophrenia as they were found only or mainly in the SUnR group.
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Evaluation of the efficacy of Sociocognitive and Neurocognitive Training dedicated for patients with anorexia nervosa
Julia Jeschke, Ewelina Wilkos, Dorota Kulakowska, Katarzyna Kucharska
Objective: Patients with AN experience difficulties in social cognition and neurocognition functioning during the course of the disease. The aim of this research was to evaluate the efficacy of original intervention - Sociocognitive and Neurocognitive Training in improving these impairments.
Participants and Methods: Research group: Patients hospitalized at the Department of Children and Adolescents Psychiatry, diagnosed with anorexia nervosa (AN) got an assessment of neurocognitive and social cognition functioning before and after the Sociocognitive and Neurocognitive Training programme. The study included patients diagnosed with AN (according to ICD-10; DSM-V), age variety 14 - 20 y.o, of Polish origin, right-handed, unrelated, with at least a basic education and within the intellectual norm. Exclusion criteria from the study was a brain damage, impaired hearing or sight, and alcohol or drug misuse/dependence. The control group of healthy subjects (n = 40) was recruited from school students. The training programme is bulit of 20 sessions, conducted in the period of 10 weeks. Programme consists of 2 parts: neurocognitive therapy and social cognition therapy, 10 sessions each.
Results: Preliminary results show an improvement in neurocognitive and social cognitive functioning, both in performance in the final assessment using test batteries, as well as in the evaluation written by patients themselves.

Conclusions: Social Cognitive and Neurocognitive Training programme is a useful standardized tool in neuropsychological rehabilitation. It helps patients with AN to improve both their social functioning and cognitive flexibility and global thinking.
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Corpus callosum morphology in patients with first-episode schizophrenia: association with negative symptoms
Mie Matsui, Michio Takahashi, Mitsuhiro Nakanashima, Tsutomu Takahashi, Michio Suzuki
Objective: The corpus callosum is the major commissural fiber connected each hemisphere. Previous studies have reported that reduced size of corpus callosum on mid-sagittal plane in schizophrenia. However, there were inconsistent findings for the size of callosal area in first-episode schizophrenia (FESz). One of the possibilities for these conflicting results might be a variety of illness duration in patients with FESz. The present study investigated the abnormalities of corpus callosum size in patients with recent onset FESz.
Participants and Methods: Forty-six patients with first episode schizophrenia whose duration of illness were less than 1 year and 46 age-, sex- and handedness-matched healthy controls were recruited to examine the area of corpus callosum using MRI. We measured the subivisions of callosal using Witelson's schema.
Results: There was no significant diagnosis effect and diagnosis by gender interaction on the whole area of corpus callosum, while gender effect was significant. Similarly, significant diagnosis effect for regional area was absent, whereas gender effect was trend level. The rostrum part of corpus callosum was significantly correlated total score and some subtotal scores, including Affective flattening, Avolition, and Anhedonia, on the Scale for the Assessment of Negative symptoms.
Conclusions: Our findings showed that there was no reduction of whole and regional area on mid-sagittal section among resent onset FESz. In summary, the change of corpus callosum size did not exist or was not noticeable among recent onset FESz, although subtle morphological change existed.
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Social Cognition in Early Phases of Psychosis: A Case-Control Study of Gender-Related Differences
Guillem Navarra, Sol Fernández-Gonzalo, Marc Turón, Esther Pousa, Diego Palao, Mercè Jodar
Objective: To study possible gender differences in specific aspects of Social Cognition, such as Affective and Cognitive Theory of Mind (AToM and CToM) and Emotional Processing (EP) skills in patients with recent diagnosis of psychosis (schizophrenia/schizoaffective disorder) and healthy subjects.
Participants and Methods: We recruited 39 patients with schizophrenia or schizoaffective disorder (19 males and 20 females) and 39 healthy subjects (19 males and 20 females) matched by age and years of education. The Reading the Mind in the Eyes Test (RMET) was used to evaluate AToM. First and Second-order False-Believe tasks (FB_1o and FB_2o) were used to evaluate CToM. The Pictures of Facial Affect (POFA) was used to evaluate EP.
Results: Compared to healthy subjects, patients' performance was significantly impaired in RMET ($p<0.001$), FB_2o ($p=0.002$) and POFA ($p<0.001$), but not in FB_1o. No significant differences were found between male and female patients in any tests. In healthy subjects, significant differences were observed between females and males in RMET ($p=0.004$) and POFA fear ($p=0.004$).
Conclusions: Gender-related differences were only found in healthy subjects, with females outperforming males in AToM and specific aspects of EP (fear recognition). Thus, these results suggest that social cognition performance in people with recent diagnosis of psychosis could be attributable to the illness itself, rather than gender. Further studies focused in the identification of the specific illness characteristics related to the social cognition difficulties in psychotic patients, and in the relation between AToM and EP in healthy subjects will be discussed.
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Common transdiagnostic cognitive deficits among people with psychiatric disorders exposed to childhood maltreatment: A systematic review
Alexandra R.-Mercier, Marjolaine Masson, Caroline Cellard
Several psychiatric disorders sharing common genes - such as depression, schizophrenia, ADHD, bipolar disorder, anxiety disorders - are commonly associated with several neuropsychological deficits. Childhood maltreatment is also a risk factor for the development of neuropsychological impairments but its impact on neuropsychological functioning of persons with a psychiatric disorder is still unknown.
Objectives: The objective of this systematic review was to identify common transdiagnostic cognitive deficits in persons with a psychiatric disorder and to evaluate the impact of maltreatment on neuropsychological functioning.
Method: Nineteen studies published between 1970 and October 2015 were identified according to the following criteria: 1) to have two groups recruited with psychiatric disorder, 2) to have a group who suffered from maltreatment during childhood or adolescence and 3) to report an assessment of neuropsychological functioning using standardized neuropsychological test.
Results: Fourteen studies show a negative impact of maltreatment on cognitive performance in the maltreated and psychiatric group relative to psychiatric group. Common transdiagnostic cognitive deficits were identified: intelligence, working memory, executive functions, verbal episodic memory and processing speed. The psychiatric profile of youth is marked by the presence of comorbidity and a broad range of disorders so it is difficult to identify common cognitive deficits. Adults with psychotic disorders shared impairments in executive functions and those with mood disorders showed verbal episodic memory impairments.
Conclusion: These cognitive domains represent common transdiagnostic cognitive deficits which could provide leads for investigating the causes of psychiatric disorders while considering environmental factors such as childhood maltreatment for developing innovative treatments.
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The Neuropsychiatric Sequelae of Vestibular Disorders
Laura Smith, David Wilkinson, S Surenthiran, Rowena Bicknell, Mayur Bodani
Objective: The vestibular system detects the position and movement of the head and plays a significant role in gait, posture and ocular-motor reflex control. An emerging body of evidence suggests that the vestibular system also contributes to cognition and affect. Individuals with vestibular dysfunction are not, however, routinely screened or treated for co-morbid psychological symptoms.
This study aimed to examine the prevalence of cognitive and affective disturbances in vestibular pathology patients to estimate the need for intervention and further understand how messages from the vestibular system influence mental function.
Participants and Methods: 100 patients diagnosed with primary vestibular disorder at their initial neuro-otology appointment completed validated neuropsychological assessments of depression, anxiety, depersonalisation, fatigue, sleep, memory, attention and executive function. Balance function testing was also completed to quantify vestibular pathology.
Results: All patients showed evidence of clinical impairment on at least one neuropsychological measure, the majority experienced a combination of neuropsychiatric symptoms. Anxiety, fatigue, working memory impairment and problems sustaining attention were especially common (over 50% fell outside the normative cut-off). The most important predictor of these co-morbidities was the presence of a vestibular dysfunction itself, age and prior access to psychological services were also relevant.
Conclusions: Previous studies indicate that vestibular loss impacts mental function, however, these have been relatively limited in scope. The present findings identify new clusters of impairment and highlight the importance of vestibular function to cognition and well-being. Clinical services should consider the strong demand for neuropsychological diagnosis, assessment and management in patients with vestibular dysfunction.
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The Double Burden of Age and Disease on Cognition and its Underlying Neural Circuitry in Major Depressive Disorder
Sara Weisenbach, Julia Rao, Robert Welsh, Jon-Kar Zubieta, Scott Langenecker
Objective: Major Depressive Disorder (MDD) is often a chronic illness, typically appearing during adolescence and occurring multiple times throughout the adult life span. Mood disorder during late life has been associated with executive dysfunction, slowed processing speed, and semantic memory changes, with underlying neural circuitry alterations. In late life, these changes are thought to reflect cumulative effects of illness risk, scar, state, and burden, in the context of an aging brain.
Participants and Methods: This presentation will provide an overview of our group's behavioral and fMRI studies of age X depression interactions in cognitive control and semantic memory. Participants include 69 young adults (35 MDD) and 47 (non-demented) older adults (24 MDD) who underwent comprehensive neuropsychological testing and fMRI while performing tasks of cognitive control verbal memory encoding.
Results: An accelerated effect of aging in MDD was detected for both cognitive control and semantic memory. fMRI suggests a pattern of compensation (increased within network activation) and dedifferentiation (greater out-of-network activation) during cognitive control, but reduced within-network activation during encoding of novel verbal stimuli.
Conclusions: A double burden of age and disease in the domains of cognitive control and semantic memory is apparent among older adults with MDD. Surprisingly, there is disparate underlying neural activation patterns for cognitive control (increased) relative to memory (decreased). Given that MDD in late life is a risk factor for dementia, neuropsychological and neuroimaging findings might be utilized as biomarkers of incipient Mild Cognitive Impairment and risk for dementia among older adults with depression.
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Is implicit learning intact in autism? Behavioral and ERP results from a statistical learning task
Fenny Zwart, Constance Vissers, Roald Maes, Roy Kessels
Abstract: Autism Spectrum Disorder (ASD) is characterized by deficits in social and communication skills as well as deficits in language and motor domains. It is precisely these skills that are thought to develop largely by implicit, or 'incidental', learning mechanisms. Hence, an influential theory in ASD research posits that ASD originates from a deficit in implicit learning capacities. However, the majority of implicit learning studies in ASD does not find support for this theory. The aim of the current project is to provide evidence that implicit learning capacities are intact in ASD and it is rather the propensity to use implicit learning strategies that differs from people without ASD; while people with ASD can learn implicitly, they prefer to use other, explicit strategies. In the current EEG-study, implicit and explicit learning are investigated in a group of adults with ASD (n=20) and a group of controls (n=23) by using an adapted version of the widely used Serial Reaction Time Task (SRTT). Behavioral results show evidence that implicit learning as well as explicit learning is similar for the ASD group compared to the control group. However, interestingly, EEG results suggest reduced evidence of implicit learning as represented by an enhancement of P300 to novel stimuli for the ASD group. Our lab is currently performing in-depth analyses on the EEG data which should elucidate further on the question whether electrophysiological mechanisms underlying implicit learning are altered in ASD.
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Forensic Neuropsychology - Poster Session 5 - 08.30 - 10.30		
Number	**Presenter**	**Poster Title**
47	Marek Celinski	Toward a culturally fair comparison between CARB and PsychoAssistant
48	Ashok Jansari	My brain made me do it: Using A new ecologically-valid assessment of executive functions to investigating the potential involvement of head injuries in subsequent criminal behaviour
49	Jaspreet Rai	Aggregating embedded validity indicators (EVIs) within Conners' CPT-II provides a better estimate of performance validity than cut-offs on individual scales in patients with traumatic brain injury

Toward a Culturally Fair Comparison between CARB and PsychoAssistant
Marek Celinski
Objective: Compare the sensitivity of two SVTs while minimizing cultural bias. Psycho Assistant (PA) involves recognition of overlearned "iconic" material that should not be affected by head injury. PA utilizes immediate initial feedback and contingent retraining of trivial visual information before retesting in the second subtest (PA-RET). CARB involves immediate identification of numeric stimuli following brief minimal distraction.
Participants and Methods: A total of 249 Toronto compensation claimants were given CARB and Psycho Assistant (PA) in their evaluation. Patients were 47% female and averaged 42 years of age and 13 years of education. Binary logistic regression using backwards LR elimination (in two steps) was used to assess demographic variables and relative classification rates.
Results: Patients failing either SVT were significantly older, and those failing PA-RET were less educated (average 2 years). Predicting PA-RET failure using demographic variables at 95% specificity identified only 23% of patients, but adding CARB scores increased sensitivity to 52% (83% overall classification). However, predicting CARB failure was not aided by demographics and the addition of PA-RET ***scores*** at 95% specificity only identified 29.5% of patients (78% overall).
Conclusions: Sensitivity concordance between CARB and PA-RET was low at 95% specificity. However, the average overall classification rate exceeded 80%. It thus appears to be a useful measure that is unlikely to over-diagnose poor effort. While PA may be less sensitive than other SVTs, it has recently been shown to be more closely related to measures assessing overlearned knowledge, as compared with CARB, WMT and TOMM.
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My Brain Made Me Do It: Using A New Ecologically-Valid Assessment Of Executive Functions To Investigating The Potential Involvement Of Head Injuries In Subsequent Criminal Behaviour
Ashok Jansari, Victoria Jefferies
Objectives: Research has suggested that many prison inmates have sustained a head injury during childhood/adolescence and often, this was prior to committing their first offence (Wald & Helgeson, 2014). Many head injuries damage frontal brain regions which are still developing through adolescence. We investigated executive functions (EFs) in ex-offenders with the Jansari assessment of Executive Functions (JEF©), an ecologically-valid task. JEF© has been demonstrated to be sensitive for assessing adults with acquired brain injury (Jansari et al, 2014). Performance is evaluated on eight EF constructs: Planning, Prioritisation, Selective-Thinking, Creative-Thinking, Adaptive-Thinking, Action-Based Prospective Memory (PM), Event-Based PM and Time-Based PM.
Methods and Participants: Sixteen ex-offenders were compared to 30 age and IQ-matched non-offenders on JEF©. Level of head injury during childhood was evaluated using a Traumatic Brian Injury (TBI) questionnaire.
Results: A one-way MANOVA on JEF© performance revealed a main effect of group $F(9,36)=21.16$, $p=.009$, Wilks $\lambda= 0.159$, $\acute{\eta}2$ of 0.841 with the power to detect the effect high (1.0); the ex-offenders were significantly impaired on all 8 individual constructs. Further, 87% of the ex-offenders had sustained a TBI preceding the age of

their first offence and severity of head injury was positively related to difficulty on JEF©.
Conclusions: Our results demonstrate significantly impaired EFs in ex-offenders and a relationship between these and childhood head injuries. We suggest that a substantial proportion of ex-offenders should be viewed as adults with undiagnosed TBI; further, rehabilitation techniques should be used with this population to help reduce the 40% reoffending rates currently found in UK and other countries.
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Aggregating embedded validity indicators (EVIs) within Conners' CPT-II provides a better estimate of performance validity than cutoffs on individual scales in patients with traumatic brain injury
Jaspreet Rai, Chantalle Pelletier, Brandon Zuccato, Brittany Kucharski, Eben Schwartz, Robert Roth, Laszlo Erdodi
Objective: Scores from the CPT-II have been found to be sensitive to invalid responding in patients with TBI. Erdodi and colleagues (2014) showed that aggregating cutoffs on five CPT-II scales produced a superior index of performance validity when compared to individual scales. The present study aimed to replicate those findings in a different sample, using different criterion measures.
Methods: The sample consisted of 47 patients (46.8% male) medically referred for neuropsychological testing after a TBI. Most (87.2%) sustained a mild TBI. Mean age was 37.4 (*SD* = 14.7, range: 16-66) and mean education was 13.7 years (*SD* = 2.7, range: 8-20). The Recognition Memory Test (Words) was the main reference PVT, complemented by a composite of five EVIs.
Results: Patients passing reference PVTs differed significantly from those who failed on Omissions, Hit Reaction Time Standard Error (HRT SE), Variability and Beta, with a large effect size (*d*: .77-1.16). Previously-reported cutoffs (Omissions T >65, HRT SE T >70, Variability >70 and Perseverations >70) produced good overall classification accuracy (62-85%), with sensitivity around .50 and specificity around .90. Commissions >70 reached the desired level of specificity (.90) against reference PVTs, but had poor sensitivity (.00-.25). Aggregating individual EVIs produced better signal detection properties, with 76-80% overall classification accuracy.
Conclusions: Results support the use of CPT-II based EVIs in patients with TBI. However, the Commissions scale failed to effectively separate valid from invalid response sets in the present sample, suggesting that commission errors may overlap with credible impairment more than other scales.
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Poster Session 6: Friday 8th July 2016 - 15.00 - 17.00

Epilepsy - Poster Session 6 - 15.00 - 17.00		
Number	**Presenter**	**Poster Title**
1	Mariana Cairós	Disadvantageous decision making in right temporal lobe epilepsy
2	Mariana Cairós	False recognition in mesial temporal lobe epilepsy: Differences between associative and semantic mechanism.
3	Mariana Cairós	Learning effects in a planning task in children and adults with frontal lobe epilepsy
4	Matthew Harris	Neuropsychological Assessment Battery (NAB) memory module performance in left versus right temporal lobe epilepsy
5	Dayra Hernández-Pérez	Neuropsychological characteristics in Mexican adults with frontal lobe epilepsy
6	Mayumi Hirozane	A short version of a naming test (the test of lexical processing in aphasia) for patients with temporal lobe epilepsy
7	Stephanie Pantelides	Spatial memory integration and recall in patients with idiopathic temporal lobe epilepsy: preliminary findings
8	Dalin Pulsipher	Performance of children and adolescents with epilepsy or psychogenic non-epileptic seizures on three measures of effort
9	Ana Paula Pereira	Cognitive rehabilitation of attentional processes in epilepsy
10	Arianna Stefanatos	Psychosocial functioning in children with frontal and temporal lobe epilepsy
11	Faraneh Vargha-Khadem	Factors predictive of emotional and behavioural difficulties in children with refractory focal epilepsy
12	Ingram Wright	The Mirror Memory Task - Concurrent validity and sensitivity to temporal lobe dysfunction
13	Silvia Cámara-Barrio	Neuropsychological spectrum of paediatric patients with refractory epilepsy and hypothalamic hamartoma
14	Silvia Cámara-Barrio	Analysis of neuropsychological findings in symptomatic and idiopathic Encephalopathy with Status Epilepticus during Sleep (ESES) syndrome

Disadvantageous Decision Making In Right Temporal Lobe Epilepsy
Mariana Cairós, Emilio Verche, Ruth Marrero-Abrante, José Flores, Sergio Hernández
Objective: Decision making impairment has a direct impact in the ability to achieve a fully independent life. Since temporal lobe epilepsy (TLE) patients have problems both in executive functions and emotional issues, our aim was to study temporal lobe epilepsy patients performance in decision making under objective risk condition taking into account the lateralization of epilepsy foci.
Participants and methods: Participants were 33 TLE subjects (15 right-TLE and 18 left-TLE) and 15 healthy control subjects. All participants were adults and completed the Cambridge Gambling Task from the CANTAB®. This test measures decision making under objective risk and has 6 outcome measures: quality of decision making, deliberation time, delay aversion, risk taking, overall proportion bet and risk adjustment. Data were analysed using 1-way ANOVA and effect size were calculated.
Results: Significant differences were found between right-TLE and controls in quality of decision making and a big size effect was found between left-TLE and control group. Left-TLE and control group had significant differences in deliberation time. Big effect sizes between right-TLE, left-TLE and controls were found on risk taking.
Conclusions: Although all temporal lobe epilepsy participants have poor quality on decision making task, they do make different performance. Whereas left-TLE need more time to take decisions, right-TLE show lower risk tolerance on decision making task under objective risk. So reflexive system commonly use on this task might be impaired on right-TLE patients, which lead to a dorsolateral prefrontal cortex malfunction.
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False recognition in Mesial Temporal Lobe Epilepsy: Differences between associative and semantic mechanism
Mª Ángeles Alonso, Mariana Cairós, Ruth Marrero-Abrante, José Flores
Objective: Mesial Temporal Lobe Epilepsy (mTLE) is a common epilepsy type which implies memory problems. Our aim was to analyse the role of the associative and semantic activation on false memories using the DRM paradigm (Deese-Roediger-McDermott).
Participants and methods: We use 24 word lists with different relations (associative or semantic) which had the same not studied critical item. Participants were 18 mTLE subjects (10 with hippocampal sclerosis - HS) and 17 healthy control subjects. Our design was 2x2x4 with participants group (control vs TLE-MS) as subject factor, list type (associative vs semantic) and item type (studied item, critical item, control item or distract item).
Results: Significant differences were found between mTLE and controls in false recognition, specifically on associative lists. Both groups have shown significant differences on intrusions amount. The results are discussed on the "Activation / Monitoring Theory" and "Fuzzy Trace Theory".
Conclusions: mTLE patients have alteration on medial temporal areas have not only problems on memory itself but also in false

recognition of associative items. Our results follow the ones found in many studies on healthy population which have shown that temporal medial areas and hippocampus are involved in false recognition tasks.
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Learning Effects in a Planning Task in Children and Adults with Frontal Lobe Epilepsy
Emilio Verche, Mariana Cairós, Ruth Marrero-Abrante, Sergio Hernández
Objective: Frontal Lobe Epilepsy (FLE) has been related with problems in attention, working memory, mental flexibility, response inhibition, anticipation, planning, and decision-making. However, these studies only focused on executive function at a whole and have not studied deeply each function. The objective of this work is to study the planning process in adults and children with FLE.
Participants and Methods: Participants were 20 FLE subjects (10 adults and 10 children) and 20 healthy control subjects (10 adults and 10 children) aged 10-50. They all completed the Stockings of Cambridge test from the Cambridge Neuropsychological Testing Automated Battery (CANTAB). This test measures planning and has 3 outcome measures: correct trials, speed of participant's response and mean movements in each stage. Data were analysed using 2-ways ANOVA (Control vs. Epileptic and Adults vs. Children).
Results: Interaction effect was found in mean of initial thinking time in 3- and 4-movements problems. There were also significant differences between FLE and controls in movements made in 3-movements problems. Age effect was found between adults and children in 5-movements problem: mean of movements and initial thinking time, and in total problems solved with minimum movements.
Conclusions: Whereas FLE participants perform worse in planning tasks, a learning effect is shown in the first stages of the task. As long as they continue learning how to manage with the task they perform equally as control subjects and the only differences are due to age nor to epilepsy. This results are compatibles with frontal lobe deficits.
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Neuropsychological Assessment Battery (NAB) Memory Module Performance in Left vs. Right Temporal Lobe Epilepsy
Matthew Harris, Zachary Merz
Objective: In temporal lobe epilepsy (TLE), material-specific memory impairment can indicate lateralized dysfunction. Although studies have shown strong correlations between verbal memory and left temporal lobe function in epilepsy, the presumed relationship between visual memory and right temporal function seems far less consistent. This may be in part due to confounding of visual memory with verbalization. The NAB Memory Module contains several different subtests including a shape learning test with difficult-to-verbalize abstract figures. However, no known peer-review studies have been conducted specifically validating the NAB Memory Module with epilepsy patients.
Participants and Methods: Thirty-two patients with focal onset TLE (21 left hemisphere, 11 right hemisphere) who were undergoing presurgical evaluation for temporal lobectomy were compared on NAB Memory Module performance across several variables. Patients averaged 35 years of age with 13 years of education.
Results: Independent-samples T-tests revealed significant differences between those with right and left TLE on the list learning task only, with left TLE patients performing lower on immediate (p = .022), long-delay recall (p = .049) and especially yes/no recognition (p = .015). There were no significant differences for story, shape, or daily living memory variables.
Conclusions: The current results are similar to findings with other memory tests, showing strong lateralizing discriminability between left and right TLE for the NAB List Learning task but no differences for other NAB memory subtests.
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Neuropsychological characteristics in Mexican adults with frontal lobe epilepsy
Dayra Hernández-Pérez, Miguel Villa-Rodríguez
Objectives: Most of the research on Frontal Lobe Epilepsyh (FLE) has focused on child population, hence there is little research on the neuropsychological characteristics in adult population. Therefore the main objective of this project is to perform neuropsychological assessment of cognitive functions in adults with frontal lobe epilepsy.
Participants and Methods: We evaluated twenty Mexican patients diagnosed with FLE (12 with left, 8 with right frontal epileptic foci), within a range of 22-50 years of age. Clinical data regarding the condition (aetiology, presentation, treatment, and evolution) were collected, subsequently a neuropsychological battery was applied (Barcelona Test) to know the general cognitive functioning of patients.
Results: When analysing the performance of patients in a neuropsychological battery, low scores were found in tasks related to verbal fluency (phonological), working memory, verbal memory failure due to a lack of information recovery strategies, executive functioning (planning, cognitive flexibility) and praxis.
Conclusions: It is essential to acquire knowledge regarding deficits and unimpaired functions in patients with FLE. Given the observations of the current study a common group of deficits are found in FLE, this findings could be relevant to the development of early support strategies for therapeutic approaches in this type of epilepsy, which could result in a reduction of cognitive deficits and an increase in the quality of life of people with FLE.
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A Short Version of a Naming Test (the Test of Lexical Processing in Aphasia) for Patients with Temporal Lobe Epilepsy
Mayumi Hirozane, Isao Hemmi, Daichi Sone, Yoshiko Murata, Satsuki Watanabe, Mitsutoshi Okazaki, Yutaka Watanabe
Objective: Patients with temporal lobe epilepsy (TLE) occasionally exhibit naming difficulties. Since aphasia tests fail to detect these difficulties in TLE patients, a more thorough test is required, such as the Test of Lexical Processing in Aphasia (TLPA), which consists of 100 high familiarity words (HFW) and 100 low familiarity words (LFW). However, a screening test is preferable in outpatient settings. The researchers verified whether the LFW component of the TLPA was a useful screening test.
Participants and Methods: This study consisted of 22 patients with TLE (8 males, 14 females; 19-69 years old; left TLE: 15; right TLE: 7; duration: 1-51 years; education: 12-21 years). The participants completed the TLPA. The relationships between the HFW scores and the total scores, as well as the LFW scores and the total scores, were statistically analysed using Pearson correlation coefficients. Linear regression analysis was used to obtain a formula for predicting the total score using the LFW scores.
Results: The correlation between the HFW scores and the total scores was 0.91 ($p<0.0001$), and the correlation between the LFW scores and the total scores was 0.99 ($p<0.0001$). The total scores were predicted using the equation $1.23 \times$ (LFW scores) + 78.3, where the coefficient of determination was 0.98.
Conclusion: The results show that the LFW test can be used. The test requires approximately 15 minutes to screen the naming difficulties that TLE patients experience.
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Spatial Memory Integration and Recall in Patients with Idiopathic Temporal Lobe Epilepsy: Preliminary Findings
Stephanie Pantelides, Fofi Constantinidou, Savvas Papacostas
Objective: Patients with chronic idiopathic temporal lobe epilepsy (TLE) may demonstrate neuropsychological deficits that extent beyond the focus of the epilepsy. This study examined spatial memory performance in patients with left TLE using an experimental paradigm investigating spatial-linguistic integration.
Participants & Methods: Eleven participants with chronic idiopathic left TLE were recruited from the Cyprus Institute of Neurology and Genetics (age range = 28-65, mean age = 46.5) and were pair-matched with eleven healthy controls on critical demographic factors (gender, age, education, SES). During the experimental tasks participants learned the locations of 6 objects placed around them. Half of the objects were encoded visually while the others were encoded by listening to descriptions of the form "a shoe is present at

1 o' clock". Spatial recall was tested in a series of pointing trials (e.g., "imagine facing the ball, point to the pot"). Also, participants were given standard neuropsychological assessments of working and episodic memory.
Results: Mixed model MANOVA (a = .05) showed that participants with TLE were significantly slower and less accurate in their responses compared to healthy controls. Also, correlation analyses showed that accuracy and reaction time were significantly correlated with performance in standard measures of working and episodic memory.
Conclusions: The current study provides preliminary evidence that left TLE interferes with processing of spatial information regardless of the processing modality (i.e. linguistic or spatial). Results are discussed in the context of developing larger studies to explore spatial memory functioning and in identifying mechanisms to improve memory abilities in TLE.
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Performance of Children and Adolescents with Epilepsy or Psychogenic Non-Epileptic Seizures on Three Measures of Effort
Dalin Pulsipher, Whitney Keener, Jacqueline Klaver, Lisa Stanford
Objective: Some authors have expressed an interest in the ability of effort testing to aid in the differential diagnosis of patients with epilepsy and patients with psychogenic non-epileptic seizures (PNES). However, findings are mixed regarding the performance on effort tests of individuals with PNES. To date, no study has reported on effort test performance in children and adolescents with PNES. Thus, the purpose of the present study was to examine performance on multiple performance validity tests (PVTs) in youth with PNES compared to those with documented epileptic events.
Participants & Methods: This sample consists of 17 children with PNES (or a combination of PNES and true epileptic events) and 33 children with epileptic seizures only. All participants completed the Medical Symptom Validity Test (MSVT), Rey 15-Item Test, and Digit Span from the Wechsler Intelligence Scale for Children-4th Edition where Reliable Digit Span was examined. Most patients were assessed on the epilepsy monitoring unit.
Results: The PNES group was significantly older than the epileptic seizure only group. After controlling for age, there were no significant between-group differences on any of the PVT scores (p's > 0.05). Additionally, there were no significant between-group differences in the number of children that passed or failed any of the effort tests.
Conclusions: Consistent with several adult studies, children with PNES do not perform significantly worse on effort measures than those with epileptic seizures. Effort tests do not appear to be useful in discriminating PNES from true epilepsy.
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Cognitive Rehabilitation of Attentional Processes in Epilepsy
Diego Maciel, Ana Paula Pereira
A great percentage of people with epilepsy display attentional deficits that could contribute for social problems. The rehabilitation of attentional deficits in groups with TBI and stroke was extensively studied, however, there is a scarcity of studies with patients with epilepsy. The purpose of the present study was to review studies about attentional processes using cognitive and behavioral rehabilitation programs in people with epilepsy and to describe their main characteristics. A systematic literature review on rehabilitation of attention was performed searching for Portuguese, English, or Spanish articles, with publication date between 2000 and 2015, using the following words in different combinations: epilepsy, neuropsychological rehabilitation, cognitive rehabilitation, rehabilitation. The initial search yielded 1009 studies, 103 in PubMed, 6 in Scielo, 226 in Medline, 44 in PsycInfo, 460 in Pediatrics, 50 in Wiley Online Library and 40 in Seizure. Only 9 were selected after adopting the exclusion and inclusion criteria. An analysis of the methodological quality of the studies and their results was performed. It was observed that though literature in neuropsychology acknowledges the importance and effectiveness of attentional interventions using cognitive and behavioral strategies, there are very few studies about the theme with cohorts with epilepsy. The analysis of the studies highlighted the importance of an interdisciplinary work in epilepsy and the demands for methodological improvements. Guidelines for future studies in attentional rehabilitation with people with epilepsy were suggested.
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Psychosocial Functioning in Children with Frontal and Temporal Lobe Epilepsy
Arianna Stefanatos, Nancy Nussbaum
Objective: There is strong evidence that the pathogenic factors that underlie focal epileptic disorders may also contribute to significant behavioral and emotional difficulties. Individuals with epilepsy demonstrate significantly higher rates of psychiatric disturbances than are observed in typically-developing controls or patients with other chronic medical conditions. However, few studies have attempted to directly correlate these apparent psychiatric vulnerabilities with localization of specific seizure foci. We therefore evaluated the degree and selectivity of patterns of psychosocial dysfunction in children with frontal (FLE) and temporal (TLE) lobe epilepsy.
Participants and Methods: Participants were 51 children between the ages of 6 and 16 years with intractable epilepsy who were referred for clinical evaluation at Dell Children's Medical Center (DCMC). During this assessment, parents completed questionnaires regarding their child's behavioral and psychosocial functioning.
Results: Both the FLE and TLE groups demonstrated significant impairments in internalizing and externalizing behavior problems relative to normative values. The frequency of clinically significantly impairment in the two patient groups was comparable, with the Fisher's exact tests demonstrating no group differences on any of the subscales.
Conclusions: Taken together, the findings of the current study argue against the existence of epilepsy syndrome-specific patterns of emotional and behavioral dysfunction in individuals with childhood-onset epilepsy. These results provide important insights into the organization of behavioral functions following early neurological insults associated with epilepsy.
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Factors predictive of emotional and behavioural difficulties in children with refractory focal epilepsy
Margarita Sarri, Sue Harrison, Dawn Langdon, Faraneh Vargha-Khadem
Objective: Focal epilepsy in childhood is associated with increased risk for developing behavioral, emotional, cognitive and social-adaptive impairments. The present study focused on mental health difficulties in paediatric refractory focal epilepsy. It involved a detailed evaluation of the predictive power of several demographic (gender, age at assessment), clinical (age at onset and duration of epilepsy, seizure frequency), localization (lobe and lateralization of pathology) and cognitive variables (performance in intellectual and memory measures) for mood, conduct, inattention/hyperactivity and peer relationship difficulties, as assessed by parental report.
Participants and Methods: Data from a population of 282 children and adolescents were examined using a series of univariate and multivariate analyses.
Results: Results indicated that mental health difficulties were highly prevalent, with peer relationships being the most frequent area of difficulty, followed by inattention/hyperactivity and emotional difficulties. Associations between the variables were examined and individual emotional/behavioural difficulties were revealed, partially confirming findings in the literature. Longer duration of epilepsy increased the risk for developing emotional difficulties; male gender and earlier age at onset was a risk for conduct difficulties; male gender, earlier age at onset, longer duration and frontal lobe localisation increased the risk for attention/hyperactivity difficulties; and longer duration, higher seizure frequency and right hemisphere lateralisation heightened the risk for peer difficulties. Lower cognitive functioning was associated with increased mental health difficulties and lower VIQ was predictive of all types of difficulties.
Conclusions: These findings highlight the importance of early assessment and intervention for children with epilepsy who are at high risk of developing mental health problems.
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The Mirror Memory Task - Concurrent validity and sensitivity to temporal lobe dysfunction
Tara Devoy, Hayley Ryan, Orlagh Keeting, Ellie Brooks, Kit Pleydell-Pearce, Alex Marsh, Ingram Wright
Objective: The Mirror memory task (MMT) is a novel measure of visuospatial memory, developed with an aim to more accurately assess visual memory and detect right temporal lobe dysfunction (TLD) in patients with epilepsy.
Participants and Methods: This paper presents research findings trialling the MMT in child and adult populations (8-60 years). The research aimed to establish the convergent validity of the MMT alongside pre-established memory tests in a healthy population of children and adults (N=75). Secondly, data from a sample of patients with temporal lobe epilepsy (N=20) was used to ascertain specific sensitivity to visual memory impairment. All participants completed the MMT, which included graduated task difficulty. In addition, participants completed subtests from established memory measures including the Doors and People, the NEPSY-II and the WMS-IV.
Results: There was a significant correlation between the MMT and the visuospatial Shapes Recall and Memory for Designs for both adults and children (r = 0.4 to r = 0.5). A valid influence of difficulty on performance was also found, suggesting that the MMT is suitable for detecting differing levels of impairment across a wide age range. Finally, we demonstrate that the MMT is sensitive to memory impairment in temporal lobe epilepsy.
Conclusions: The findings with heathy participants suggest that the MMT is suitable to assess differing levels of impairment across a broad age range. In patients with epilepsy, we demonstrate the sensitivity to TLD and specifically to visuo-spatial memory deficits associated with right temporal lobe pathology.
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Neuropsychological Spectrum Of Pediatric Patients with Refractory Epilepsy and Hypothalamic Hamartoma
Silvia Camara-Barrio, MªConcepcion Fournier-del Castillo, Marta García-Fernandez, Arturo Ugalde-Canitrot, Javier Melero-Llorente, Fernando Robles-Bermejo, Mª Angeles Pérez-Jiménez
Objective: To describe four cases of refractory epilepsy secondary to hypothalamic hamartoma (HH) based on neuropsychological, video-EEG monitoring and high-resolution MRI findings, and to emphasize the variability of cognitive and behavioural phenotypes.
Patients: Patient 1 had a small HH (1.1 cm), seizure onset at two years of age, and very frequent epileptiform activity during sleep. The neuropsychological profile revealed patent and generalized impairments with a behavioural pattern of attention and impulse control disorders. Patient 2 had a small HH (1.2 cm), neonatal-onset epilepsy and a normal EEG during both wakefulness and sleep, without epileptiform activity. The neuropsychological profile showed subtle impairments in working memory and verbal fluency, and clinical signs of combined attention deficit hyperactivity disorder. Patient 3 had a giant HH (5 cm), neonatal-onset epilepsy and very frequent epileptiform activity during sleep. The neuropsychological profile consisted of distinct and generalized impairments, with marked disturbances of executive functions involved in the regulation of behaviour (impulse inhibition and emotional control). Patient 4 had a giant HH (4 cm), seizures since the age of three years and very few epileptiform abnormalities on the EEG. Both cognitive and behavioural profiles were strictly normal.
Conclusions: Cognitive profiles and behavioural disorders are variable in patients with refractory epilepsy related to HH, regardless of HH size, age at seizure onset and intractability. EEG epileptiform abnormalities seem to remain nevertheless a determinant of the neuropsychological disturbances in these patients.
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Analysis of neuropsychological findings in symptomatic and idiopathic Encephalopathy with Status Epilepticus during Sleep (ESES) syndrome
Fernando Robles-Bermejo, Mª Concepción Fournier-del-Castillo, Javier Melero-Llorente, Silvia Cámara-Barrio, Marta García-Fernández, Arturo Ugalde-Canitrot, Mª Ángeles Pérez-Jímenez
Objective: To describe differences between the neuropsychological profiles of symptomatic and idiopathic ESES.
Participants and Methods: We reviewed the clinical records of 16 children (9 boys and 7 girls) with ESES, which included two successive assessments (mean age was 7.9 years in the first evaluation and 8.8 in the second) both performed during the active phase. Patients were divided into two groups: 8 children with symptomatic ESES (SG) and 8 with idiopathic ESES (IG). Mean time of first neuropsychological assessment after ESES onset was 9 months in both groups.
Results: No statistically significant differences were found in terms of ESES duration between both groups. However, differences were observed regarding age of onset (p=0.005) with earlier ESES onset in IG. In the first assessment, SG showed significantly poorer scores in relation to IG on Total Intelligence Quotient (IQ) (p=0.021), Perceptive Reasoning IQ (p=0.001), Manual Speed (p=0.045), Visual Closure (p=0.017), Visual Attention (p=0.017), Visuomotor Coordination (p=0.008), Visuo-Constructional Praxis (p=0.015), Non-Verbal Abstract Reasoning (p=0.006), Semantic Fluency (p=0.024) and Arithmetic (p=0.012). In SG, cognitive difficulties remained similar on follow-up compared to the first assessment, whereas IG patients showed cognitive deterioration mainly reflected by decreased Total IQ (p=0.024) and Perceptive Reasoning IQ (p=0.018) scores.
Conclusions: In IG, earlier onset and persistence of ESES are associated with progressive cognitive deterioration, whereas in SG, which presents with generalized cognitive impairment related to the structural lesion, the decline at follow-up is not significant.
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Genetics/Genetic Disorders - Poster Session 6 - 15.00 - 17.00		
Number	**Presenter**	**Poster Title**
15	Silvia Cámara-Barrio	Role of molecular consequences or tuberous sclerosis complex mutations in neurodevelopmental level of affected children
16	Georgios Argyropoulos	Neocerebellar abnormalities in a neonate with the FOXP2 mutation
17	Jos Egger	Genetic subtyping and its implications for clinical management: The case of 22q11.2 syndrome
18	Renée Roelofs	Intellectual development in Noonan syndrome: A longitudinal study
19	Ellen Wingbermühle	Quality of life in adults with Noonan syndrome

Role of Molecular Consequences of Tuberous Sclerosis Complex Mutations in Neurodevelopmental Level Of Affected Children
Javier Melero-Llorente, Concepción Fournier-Del Castillo, Fernando Robles-Bermejo, Silvia Cámara-Barrio, Verónica Cantarín-Extremera, Beatriz Bernardino-Cuesta
Objective: To compare the neurodevelopmental level in children with tuberous sclerosis complex (TSC) and secondary epilepsy as a function of molecular consequences of mutations in the TSC1 and TSC2 genes.
Participants and Methods: Clinical records of 17 children (9 male, 8 female; mean age 75.47 months) with diagnosis of TSC and epilepsy (47% with a history of infantile spasms) were reviewed. Long-range PCR and MLPA was used to sequencing TSC1 and TSC2 genes. Cognitive assessment was performed either with Wechsler Scales and comprehensive cognitive evaluation (53% of children), or with Battelle Developmental Inventory, depending of age and neurodevelopmental level.
Results: There were 3 TSC1 and 14 TSC2 mutations. Five patients (29.4%) showed missense variants (MS) with non-truncated protein, and twelve patients (70.6%) showed nonsense or frameshift variants (NS/FS) resulting in a truncated protein. There were no statistically significant differences between MS and NS/FS groups regarding age, sex, TSC1/TSC2 mutations, or history of infantile spams.
MS group showed higher neurodevelopmental level than NS/FS group (p=0.027); intellectual disability (IQ or DQ < 70) was present in 75% of children in the NS/FS group, but not in the MS group (p=0.009). NS/FS group had poorest scores on non-verbal abilities: PRI (p=0.032), visuoconstructive skills (p=0.05), non-verbal

reasoning (p=0.016) and visual memory (p=0.014).
Within the NS/FS group there was a lower neurodevelopmental level in children with history of infantile spasms (p=0.026).
Conclusions: Patients with nonsense or frameshift variants show a lower neurodevelopmental level; however, a history of infantile spasms modulates this genotype-phenotype relationship.
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Neocerebellar abnormalities in a neonate with the FOXP2 mutation
Georgios P.D. Argyropoulos, Rachael Elward, Maneet Saini, Mortimer Mishkin, Faraneh Vargha-Khadem
Objective: A dominantly inherited verbal and orofacial dyspraxia in half the members of the multi-generational 'KE family' is linked to a mutation in FOXP2, the first gene implicated in the developmental processes culminating in articulate speech and language. Neural and genetic substrates of this disorder may inform the ontogeny and developmental trajectory of human speech. *Foxp2* expression is known to occur strikingly early during embryonic development and is prominent in the human, rodent and avian olivo- and ponto-cerebellar circuits. Indeed, imaging studies from our laboratory on affected KE family members aged 9-77 years have previously reported structural and functional abnormalities in the cerebellum as well as other cortical and subcortical structures. However, up to now, it had not been possible to document the emergence of FOXP2-dependent abnormalities in the brain of affected neonates from this large pedigree.
Methods: We analysed structural T_1- and T_2-weighted magnetic resonance images acquired from a neonate with the FOXP2 mutation, his unaffected twin, and 12 healthy control neonates (6-16 weeks-old). We used voxel-based morphometry and volumetry to investigate grey- and white-matter abnormalities in the affected neonate.
Results: We report a marked reduction of neocerebellar lobule VIIa Crus I in the affected member as compared to his unaffected sibling and unrelated controls.
Conclusions: FOXP2 mutation is associated with cerebellar Crus I volume reduction from the early stages of neonatal life, consistent with the gene's expression in the human embryonic cerebellum. These findings highlight the significance of cerebellar abnormalities in developmental orofacial dyspraxia in the pre-linguistic infant.
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Genetic subtyping and its implications for clinical management: The case of 22q11.2 syndrome
Jos Egger, Willem Verhoeven, Joep Tuerlings, Nicole De Leeuw
Objectives: The 22q11.2 deletion syndrome (22qDS), mostly caused by the *common* deletion (LCR-A-D) including *TBX* and *COMT* genes, is highly associated with congenital anomalies and endocrine dysfunctions accompanied by schizophrenia-like psychoses and autism spectrum disorders. The *distal* deletion (LCR-D-H) comprises the *MAPK1* gene and is associated with specific heart defects and the presence of anxiety disorders. The relatively rare *central* deletion (LCR-B-D) encompasses the *CRKL* gene and predominantly shows renal/urogenital anomalies in combination with autistic-like behaviours.
Participants and Methods: Thirty patients with genetically proven and subtyped 22q11DS were referred to the Dutch national outpatient facility specialized in psychopathology and genetics for detailed cognitive neuropsychiatric assessment in order to ascertain the most appropriate neuropsychological and psychopharmacological strategy.
Results: Apart from one distal and one central deletion, common deletion was found in 28 patients. They presented with a variable level of intellectual disability. Patients with common deletion had a history of relapsing schizophrenia-like psychoses, partial or non-responsive to conventional antipsychotics, and often accompanied by anxieties and mood instability. The patient with distal deletion displayed anxiety symptoms, whereas in the one with central deletion, autistic-like behaviour was present. Most patients with common deletion could effectively be treated with targeted contextual measures and clozapine or quetiapine, often combined with valproic acid. The patient with distal deletion showed full remission upon treatment with citalopram whereas in the patient with central deletion, behaviour strongly improved upon contextual-neuropsychological and behavioural measures only.
Discussion: Clinical management of patients with 22q11DS should be guided primarily by its genetic subtype.
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Intellectual development in Noonan syndrome: A longitudinal study
Renée Roelofs, Nikki Janssen, Ellen Wingbermühle, Roy Kessels, Jos Egger
Objective: While cognitive impairments in adults with Noonan syndrome (NS) seem to be limited to a low-average intelligence and slower processing speed, studies in children with NS have demonstrated more extensive cognitive problems (e.g. deficits in language, memory, attention, and executive functioning). This longitudinal study is the first to investigate intellectual development in patients with NS. Although childhood IQ is expected to be lower than adult IQ, it is assumed to be a significant predictor of adult intelligence.
Participants and Methods: Sixteen patients with NS underwent intelligence assessment in childhood and in adulthood, using Wechsler's intelligence scales. IQ scores and Wechsler standard scores achieved in childhood and adulthood were compared. Childhood verbal and performance IQ (VIQ/PIQ) were included as predictors in multiple regression analyses for adult IQ and index scores.
Results: Compared with childhood scores, adult full-scale IQ (FSIQ) and PIQ significantly increased (FSIQ: $t(15)= 2.88$, $p= .01$, $\eta^2= .36$; PIQ: $t(15)= 5.49$, $p< .001$, $\eta^2= .67$). Adult PIQ was higher than VIQ ($t(15)= -2.23$, $p= .04$, $\eta^2= .25$). Childhood PIQ and VIQ together predicted all adult IQ and index scores (*adjusted* $R^2> .62$, $F> 13.32$, $p<.001$), except for processing speed.
Conclusions: In accordance with the hypothesis, childhood IQ significantly predicted adult intelligence in patients with NS. PIQ advanced to a normal level in adulthood, while VIQ did not develop proportionately, resulting in a discrepancy between adult PIQ and VIQ. This may suggest a delay in the development of executive functioning in patients with NS, which seems to be outgrown in adulthood.
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Quality of life in adults with Noonan syndrome
Ellen Wingbermühle, Floor Nobbe, Renée Roelofs, Ineke Van der Burgt, Roy Kessels, Jos Egger
Objective: Noonan syndrome (NS) is a genetic disorder related to mutations in the RAS-MAPK pathway. Cardinal features include short stature, facial dysmorphia, congenital heart defects, subtle cognitive decrements and a slightly lowered mean IQ (≈ 90). These characteristics may bring about lowered levels of quality of life (QoL). In this study, QoL was evaluated in adults with NS.
Participants and Methods: Forty-five adult patients with NS and 26 IQ-matched, healthy controls completed the Dutch version of the Lancashire Quality of Life Profile (LQoLP), a comprehensive structured interview covering nine domains of QoL, as well as global measures on wellbeing. Groups were compared using ANOVA and chi-square tests.
Results: Patients with NS demonstrated significantly lower levels of QoL on two out of four general outcome measures (Happiness with life and Cantril's ladder, p<0.05). Contrary to the controls, the majority of patients did not have a relationship (p<0.05). A history of being bullied in youth was more prevalent in the NS group (p<0.01,) and patients presented with significantly lower levels of self-esteem (p<0.05). No difference was found in satisfaction with health, in spite of the medical burden in the NS group.
Conclusions: The QoL profile of adult NS patients differs from that of controls with respect to both subjective measures, such as happiness with life and self-esteem, and objective measures like relationship status. Lowered QoL in NS may be moderated by neurocognitive deficit, such as slower speed of information processing and alexithymic traits, which have been demonstrated in this group before.
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Language and Speech Functions/Aphasia - Poster Session 6 - 15.00 - 17.00		
Number	**Presenter**	**Poster Title**
20	Cristina Aguillon-Solis	Effect of stimulus presentation time in Broca's aphasia reading
21	Gabriele Cattaneo	Between and within language control in Parkinson's disease
22	Juliane Cuperus	Cognitive differentiation of disorders in communication and social interaction in children with specific language Impairment and autism spectrum disorder
23	Aviah Gvion	Surface dyslexia as a result of a deficit to the phonological output lexicon
24	Mamiko Fujiwara	The relationship between the self-awareness and the monitoring function of the language disorders
25	Valentina Galetto	IMITAF: a computerised tool for the rehabilitation of anomic deficits in aphasic subjects
26	Gur Shalom	A dissociation between wh-movement and pronouns in syntactic impairment –

Effect of stimulus presentation time in Broca's aphasia reading
Cristina Aguillon-Solis, Judith Salvador-Cruz, José Marcos-Ortega
Objective: It is been established that frequency, length and lexicality of word has an effect in reading speed and accuracy of normal people and alexic patients, nevertheless the effect of stimulus presentation time as a measure of parallel reading processes has not been sufficiently tested. The goal of this study was to analyze the effect of stimulus presentation time and its interaction with lexicality, length and frequency in the reading of a patient with Broca´s aphasia.
Participants and method: A patient with Broca's aphasia was tested with a lexical decision task of 360 written stimuli. The results were analyzed in a single-subject experimental design 2x3x2x2: lexicality (word, pseudoword), length (4, 6, 8 letters), frequency of the word (high, low) and stimulus presentation time (100ms, >1000ms).
Results: The statistical analysis showed significant main effects (α<.05) for all the variables and a significant interaction between lexicality, length and presentation time. Post-hoc test showed that the most important effects of presentation time were on reading processes that require phonological mediation.
Conclusions: The description of variables involved in reading disorders in aphasia is a first step for the creation of communication strategies that impact on the quality of life of patients. This study presents a systematic evaluation of a Spanish-speaking Broca's aphasia patient demonstrating empirically that the presentation time has an effect on the accuracy of the reading.
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Between and within language control in Parkinson's disease
Gabriele Cattaneo, Marco Calabria, Alexandre Gironell, Albert Costa
Objective: There is evidence that in bilingual Parkinson's disease (PD) patients the mechanisms of transient control are selectively affected in language switching, whereas sustained mechanisms are similarly affected in both language and non-linguistic task switching. The aim of the present study is to see whether such mechanisms of control are also affected in within language control, that is in a task which requires switching within the same language.
Participants and Methods: 24 PD patients and 17 matched healthy controls took part in the experiment. All participants were high proficient Catalan-Spanish bilinguals. Participants performed two linguistic versions of the switching task. In one version bilinguals switched between languages (Catalan and Spanish) and in the other they switched between grammatical categories (Nouns and Verbs). Also, to explore executive control (EC) participants performed working memory and attentional tasks.
Results: PD patients were impaired in transient control only when they switched between languages, whereas they were impaired in sustained control in both versions of the task switching. Moreover PD patients were impaired in EC tasks and the performance in the working memory task correlated with the degree of impairment of sustained control mechanisms in the within language switching task.
Conclusions: Mechanisms that allow bilinguals to avoid transient interference from the language not in use seem to be specific to this type of control, whereas sustained mechanism of control seems to be shared with other domains of linguistic and non-linguistic control.
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Cognitive differentiation of disorders in communication and social interaction in children with Specific Language Impairment and Autism Spectrum Disorder
Ingrid Feiter, Juliane Cuperus, Constance Vissers
Objective: Overlap exists between Specific Language Impairment (SLI) and Autism Spectrum Disorder (ASD) at the behavioral level with respect to problems in language and communication (e.g. Bishop, 1997) and at the cognitive level. Children with SLI and ASD both suffer from distorted executive functions and linguistic disorders (e.g. Vugs et al., 2015; Vissers et al., 2016). Here, we aim to differentiate children with SLI and ASD in terms of linguistic profile and working memory (WM) performance.
Participants and Methods: 45 Children, aged 8 to12 (15 SLI, 15 ASD and 15 TD) participated. Linguistic skills were assessed using the MAIN (Multilingual Assessment Instrument for Narratives) and WM using Nonword repetition (NWR), Sentence repetition, Digit Span and Listening Recall. Parents completed the Children's Communication Checklist to measure everyday communicative behavior.
Results: Linguistic profiles and WM performance are presented for all children. Diagnostic classification is related to linguistic profiles an WM performance. Preliminary results suggests that the two groups do not differ on WM normscores. Linguistic analyses of phonological errors and grammatical errors are more sensitive in differentiating both groups. Specifically, children with ASD seem to produce more deletions of subject and adverbial phrases. Further, children with ASD seem to (re)produce more plot elements.
Conclusions: The present data suggest that detailed linguistic analyses contributes to differentiating between SLI and ASD. Insight into cognitive processes which underlie disorders in communication and social interaction will lead to tailored assessment and treatment of children with developmental disorders.
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Surface dyslexia as a result of a deficit to the phonological output lexicon
Naama Friedmann, Aviah Gvion
Objective: Lexical retrieval and reading aloud are often viewed as two separate processes. However, they are not completely separate--they share components. This study assessed the effect of an impairment in a shared component, the phonological output lexicon, on lexical retrieval and on reading aloud.
Because the phonological output lexicon is part of the lexical route for reading, individuals with an impairment in this lexicon may be forced to read aloud via the sublexical route and therefore show surface dyslexia.
Participants and Methods: We tested the reading of 16 Hebrew-speaking individuals with phonological output lexicon anomia, 8 with acquired anomia following brain damage and 8 with developmental anomia.
We established that they had a phonological output lexicon deficit according to the types of errors and the effects on their naming in a picture naming task, and excluded other deficit loci in the lexical retrieval process according to a line of tests assessing their picture and word comprehension, word and nonword repetition, and phonological working-memory.To assess their reading and type of dyslexia, we tested their reading aloud,lexical decision,and written word comprehension.
Results: We found that all of the participants showed, in addition to anomia, typical surface dyslexia errors in reading aloud of irregular words, words with ambiguous conversion to phonemes, and potentiophones. All the participants performed flawlessly on pseudohomophone lexical-decision and homophone/potentiophone reading comprehension, indicating spared orthographic input lexicon and its connection to the semantic-lexicon.
Conclusions: These results thus suggest a principled relation between anomia and dyslexia, and point to a distinct type of surface dyslexia.

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The relationship between the self-awareness and the monitoring function of the language disorders

Mamiko Fujiwara, Rumi Tanemura

Objective: The purpose of this study is to investigate the aphasics monitoring function for their language disorders. The relationship between self-awareness and the monitoring function of aphasics to speech has not studied sufficiently. We studied whether aphasics who are difficult to detect to their speech errors have awareness or not.

Participants and Methods: Participants were 36 aphasics. We examined the correlation between the self-assessment for their own language ability and the percentage of detecting errors in naming test.

Results: Aphasics who could not find their speech errors felt their comprehension ability as low. In other words, aphasics aware their auditory comprehension disorders, even if they cannot monitor their own speech enough.

Conclusions: Aphasics recognized their comprehension difficulties when they felt impatience due to the experiences that they could not understand others' speech expressions. There were not clear relationship between monitoring function and self-awareness for comprehensive ability.

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IMITAF: a computerised tool for the rehabilitation of anomic deficits in aphasic subjects

Valentina Galetto, Marzia Leopizzi, Danilo Dimitri, Virginia Zettin, Anna Castagneri, Noemi Amodeo, Alessandra Mesini, Marina Zettin

Abstract: One of the most disabling consequences of aphasia is anomia, a disorder involving the word finding process. Protocols involving the role of imitation in the word recovery process have recently gained more attention.

The main aim of our study was to investigate the role of imitation in the improvement of word finding difficulties in a group of aphasic subjects. To this end, we designed a software, named IMITAF, based on the computerised program described by Lee (2010).

Six aphasic subjects with brain injury were enrolled in the study. IMITAF consists in 2700 words and 800 sentences pronounced aloud by six actors of different sex and age. Every participants was administrated with a battery of tests aimed at detecting their linguistic difficulties. Such an evaluation was repeated one month before the treatment (T0) and immediately before its beginning (T1). The treatment lasted 45 days and consisted of daily sessions lasting 90'. During every **session** the subject was asked to observe and imitate the actors pronouncing the items.

The results showed a significant improvement of the entire sample in all the analyzed measures only between T1 and T2, while, as expected, there was an absence of increase between T0 and T1. Such outcomes are consistent with many researches showing the key role played by imitation in the linguistic recovery following aphasia. Furthermore, they shed new light on the importance of intensive treatment and on the key role played by computerised softwares, which may positively impact on the subject's level of engagement.

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A dissociation between wh-movement and pronouns in syntactic impairment

Gur Shalom, Naama Friedmann

Objective: Typically developing Hebrew-speaking children before age 6 years, have difficulties understanding object relatives (either with or without resumptive pronouns (RPs)) (Friedmann, Aram, & Novogrodsky, 2011) and interpret direct object pronouns (DOPs) locally (Ruigendijk, Friedmann, Novogrodsky, & Balaban, 2010), but do not interpret RPs locally. Children with Syntactic SLI (SySLI) also have difficulties understanding sentences derived by wh-movement (including object relatives with or without RPs). The present study examined if children with SySLI also necessarily have a pronoun deficit, and if school aged children with SySLI and a pronoun deficit show the same interpretation pattern as typically developing preschool children.

Participants and Methods: School aged adolescents (N=22, ages 12-14) with SySLI were administered comprehension and elicitation tasks for object relatives (with and without RPs) and object pronouns. The participants' performance was compared to data previously collected from 87 typically-developing children.

Results: Importantly, there were participants who showed a significant difficulty in the comprehension and production of sentences with Wh movement performed like the controls on the pronoun elicitation and comprehension tasks. Participants who had both a syntactic and a pronoun deficit interpreted both RPs and DOPs locally.

Conclusions: A dissociation between Wh movement deficit and a pronoun deficit was found: adolescents with SySLI do not necessarily have difficulties with pronouns, indicating that they do not have a general deficit in dependencies. The pronoun interpretation pattern of SySLI children is different from that of typically developing children: they interpret both RPs and DOPs locally.

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Autism Spectrum Disorders - Poster Session 6 - 15.00 - 17.00		
Number	**Presenter**	**Poster Title**
33	Eva Bonda	Neurocognitive enhancement in autism spectrum disorder
34	Yiwei Chen	Social Engagement and Communicative Style Project: Do gestures serve an interpersonal function?
35	Teruo Hashimoto	Functional connectivity during implicit intention holding in children with autism spectrum disorder
36	Monika Pudlo	Reaction time and errors in Attention Network Test in high functioning adolescents with ASD
37	Maria Elide Vanutelli	Resonance mechanisms in autistic children to human-human and human-animal emotional interactions. A combined study by EEG and autonomic activity recording.
38	Cristina Varanda	The role of mirror neurons in autism and the perspective of neurorehabilitation
39	Cristina Varanda	Enhancement of cognitive flexibility among subjects on the autism spectrum

Neurocognitive Enhancement in Autism Spectrum Disorder

Eva Bonda

Abstract: Three clinical cases of autism spectum disorder, with the range of symptoms of High Functioning Autism and Asperger Syndrome, have been thoroughly assessed by neuropsychological examination and approached for treatment through neurocognitive enhancement.

The children have been assessed at chronological ages from 6 to 7 years old as prresenting Weschler Intelligence Scales for Children IQ profiles characteristic of High Functioning Autism Spectrum disorders or Asperger syndrome, that is particular strengths in ‘Similarities’ and ‘Matrix Reasoning’, and serious weaknesses in graphomotor skills and Speed Processing Index (Coding, Symbol Search, Cancellation); impairments associated with low adaptive communication abilities. Within the Verbal Reasoning Domain, all children presented atypicities in categorization processes and abstraction semantics operations, for instance difficulty in understanding metaphors and figures of speech or pendatic speech. Autism Diagnostic measures (ADI-R, ADOS), Attention-deficit Hyperactivity Disorders rating scales and Adaptive Behavioral measures have been used for full neurocognitive evaluation to assess all general diagnostic criteria of the Autism Spectrum Disorder, and establish individual cognitive differences to guide a personalized therapy protocol.

Sessions of intensive and frequent neurocognitive training resulted in radical improvement of social communication and semantic abstraction disabilities in clinical assessment and within school and social settings. In post-treatment measures, highly improved verbal communication and social empathy scores as well as reduction in anxiety or depression scores have been obtained.

The results support significant improvement of severe disturbances in semantic abstraction and social relatdness, characteristic of the Autism Spectrum, through tailored neurotechnological training of selected specific cognitive and emotional processing sub-components.
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Social Engagement and Communicative Style Project: *Do gestures serve an interpersonal function?*
Yiwei Chen, Elena Nicoladis
Abstract: People sometimes gesture, move their hands in meaningful ways, while speaking (McNeill, 2000). Why? One possible reason is to make their meaning clear to the listener. If so, then people who are less sensitive to the conversational needs of others might gesture less than those who are more sensitive. To test this possibility, we measured the degree of autism in adult males. Deficits in social abilities are the core of Autism Spectrum Disorder, which affects males more than females (Lord, Rutter, Le Couteur, 1994). We hypothesize that males who score high on the Autism Spectrum Quotient gesture less frequently.
To test our hypothesis, we asked participants to complete the Autism Spectrum Quotient (AQ) questionnaire (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). To elicit gestures, participants talked about a cartoon they watched and responded to questions about scientific (e.g. How does lightning work?) and social concepts (e.g. How do you make a friend?). To account for individual differences in how much they talked, we calculated the participants' gesture rate as the number of gestures divided by the number of words spoken.
The initial results demonstrate a weak correlation between AQ scores and gesture rate for both cartoon and explanation tasks. In other words, the frequency of gesturing is not related to the participants' degree of autism. These results do not support the argument that gestures serve an important role in interpersonal communication. We argue that gestures may be more related to an individual's construction of the message he/she wishes to convey.
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Functional Connectivity during Implicit Intention Holding in Children with Autism Spectrum Disorder
Teruo Hashimoto, Susumu Yokota, Ryuta Kawashima
Objectives: Prospective memory (PM) is, having an intention to execute in the future, then engaging the other stuffs with holding the intention implicitly, and finally remembering the intention spontaneously at proper timing. Autistic people show PM deficits in naturalistic and demanding tasks. The purpose of this study was to examine neural mechanism of PM in children with autism spectrum disorder (ASD) using resting-state functional magnetic resonance imaging (rsfMRI) method.
Participants: Participants were 18 ASD children and adolescents with full scale IQ ≧ 85 aged 8 to 15 years, and age-matched 19 typically developing (TD) children. According to the Declaration of Helsinki, written informed consent was obtained from a parent of each child. This study was approved by the institutional review board of Tohoku University medical school.
Procedures: MRI scans were approximately 25 min for brain structures and 5 min for rsfMRI. Immediately before MRI scans, participants were given a small piece of paper and instructed to give it back to the experimenter with fold after he/she leave the MRI scanner room (prospective memory task). In addition, participants were instructed to watch cartoons during MRI scans to answer three questions about the cartoon after MRI scans (ongoing background task).
Results: No significant differences were observed in PM task, however, functional connectivity from anterior prefrontal cortex associated with PM performance were different between ASD and TD children.
Conclusions: Neural network during prospective intention holding in children with ASD might be dissociated from those of TD.
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Reaction time and errors in Attention Network Test in high functioning adolescents with ASD
Monika Pudlo, Ewa Pisula
Abstrct: The aim of the study was to analyse the differences in reaction time (RT) and the number of errors between high functioning adolescents with ASD and their counterparts from a control group in Attention Network Test (ANT). 43 ASD adolescents with ASD, with Wechsler IQ in normal range ≥75, and 27 matched by chronological age and Full Scale IQ controls, aged 12–19 years, participated in the study. The design of the test was based on the original version of ANT (Fan et al.,2002), with four cue conditions and three target conditions. The MANOVA showed significant differences between the groups in reaction time at two cue conditions: for the centre cue RT ($F_{(1,66)} = 12.38$; $p < 0.001$) and the spatial cue RT ($F_{(1,67)} = 13.47$; $p < 0.001$) . As regards correctness of responses in all seven conditions, as well as in four cue conditions, and in three target conditions, more errors were made by the participants with ASD than those from control group. There appeared a Wechsler IQ full scale correlation with the number of correct responses in the incongruent target condition for the control group ($r= .475$; $p < 0.05$). The differences in RT in cue conditions are consistent with the findings of previous studies on attention in ASD adolescents. The differences in errors may result from the reduced efficiency of three attentional networks.
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Resonance mechanisms in autistic children to human-human and human-animal emotional interactions. A combined study by EEG and autonomic activity recording
Maria Elide Vanutelli, Jean-Louis Nandrino, Michela Balconi
Objective: Children with Autism Spectrum Disorders (ASD) often face social anxiety, rejection, social deficits, and negative peer interactions. Thus, developing innovative strategies to improve social communication has become an important aim. One recent solution has been the introduction of human-animal interactions (HAI): convergent evidences, in fact, suggest that animals can encourage social exchange among humans. This effect could be of primary importance for individuals with disabilities, to create a positive context for enhanced socio-emotional development. Nonetheless, the psychological and neural mechanisms underlying the affective and empathic components related to such effects are largely unknown.
Participants and Methods: To answer this question, a pilot group of children with ASD (M_{age}=8.5, SD=1.9) was shown 144 affective pictures (positive vs. negative vs. neutral) depicting both human-human (HH) and human-animal (HA) interactions during electroencephalographic (EEG) and autonomic activity (Skin Conductance Level and Response: SCL/SCR; Blood Volume Pulse: BVP; Pulse Volume Amplitude: PVA; Heart Rate: HR) recording.
Results: EEG data revealed the presence of a salience monitoring mechanism directed towards HA contexts in the form of increased high-frequency Beta and Alpha bands, while autonomic indices showed the occurrence of arousing mechanisms while viewing interactions involving other peers.
Conclusions: The present work provided significant neuroscientific data about resonance and empathic mechanisms in ASD to different social agents, and constitutes an objective contribution to the study of autism in intra and inter-species contexts, with important highlights for future therapeutic support and interventions with both other peers and companion animals during social interactions.
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The Role of Mirror Neurons in Autism and the Perspective of Neurorehabilitation
Maria de Lourdes Guedes Neta, Cristina Varanda
Objective: The discovery of mirror neurons, considered to be responsible for empathy, intrigued researchers all over the world. Some studies have associated mirror neurons to the incidence of Autism Spectrum Disorder (ASD). The proposal of this research was to analyze some of these studies concerning the participation of mirror neurons in autism and possible neurorehabilitation interventions.
Method: Bibliographical review of studies in English, published in SciELO and LILACS databases, between 2008 and 2013. The key-words used were: autism, brain, cortex and mirror neuron.
Results: Among 17 studies, 12 were bibliographical reviews and five involved experiments. 76% were favorable to the influence of these

neurons, while 24% weren't. Five of these studies mentioned possibilities of neurorehabilitation and in only two of them a neurorehabilitation intervention was carried out.
Conclusion: Even though the current research may not be conclusive, it can be said that currently neuroscientists tend to agree that mirror neurons significantly influence ASD. Recent studies suggest that, if properly stimulated, ASD individuals can develop their social skills and, consequently, be socially inserted. Only two studies presented neurorehabiliation strategies which proved to be effective in empowering ASD individuals, improving their quality of life and also their parents and/or caretakers. One of these studies showed that musical instruments could improve the mirror neuron system and, consequently, the development of the speech. According to most authors, technological development is needed in order to enable scientific advances involving mirror-neurons and ASD.
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Enhancement of cognitive flexibility among subjects on the autism spectrum
Cristina Varanda, Fernanda Dreux Miranda Fernandes
Objective: Autism is defined by qualitative deficits in communication, social interaction and the presence of restricted patterns of interests and behavior. People with autism are reported to have difficulties in the dynamic activation and modification of cognitive processes in response to changes in tasks demands. These difficulties are related to poor flexible cognition. So this research aimed to assess and intervene in cognitive flexibility in subjects with autism.
Method: Nine subjects diagnosed on the autism spectrum by psychiatrists, aged 5y6m to 13y8m, were assessed in cognitive flexibility through Wisconsin Card Sorting Test (WCST) in pretest. An intervention program with 15 to 20 sessions designed to enhance cognitive flexibility through activities of local coherence inference, constructive praxis, attentional shifting, inhibitory control, besides drama games after reading stories. In posttest they were assessed in WCST. Raw scores of perseverative errors were used.
Results: Perseverative errors were lower in posttest. An analysis with a Wilcoxon Matched-Signed Ranks test demonstrated that perseverative errors in pretest accounted for most of the errors ($z = -1,955$, $p < 0,05$).
Conclusion: The qualitative improvement showed by the individuals of the present research concerning flexible cognition suggests that more research focused on the development of strategies for the rehabilitation of flexible cognition should developed with a larger sample among subjects on the autism spectrum.
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Electrophysiology - Poster Session 6 - 15.00 - 17.00		
Number	**Presenter**	**Poster Title**
40	Gerry Stefanatos	Electrophysiological markers of auditory processing deficits in word deafness

Electrophysiological markers of auditory processing deficits in Word Deafness
Gerry Stefanatos, Harry Zobel, Emma Greenley, Bassam Eid
Objective: Word deafness is characterized by severe deficits in understanding and reproducing spoken language with preserved speech production and non-auditory language comprehension. Modality-specific disturbances of auditory temporal processing have been implicated in this pattern of deficit. However, few reports have utilized electrophysiological measures to specify the precise nature and stage at which auditory processing is compromised. Here, we contrast electrophysiological findings in two cases of word deafness, one with unilateral and one with bilateral temporal lobe damage.
Participants and Methods: Using a traditional “oddball” evoked potential (TOEP) paradigm, a complex tone was presented repeatedly every 1 to 2 seconds along with an infrequently presented “oddball”complex tone that differed in frequency composition. In the steady-state auditory evoked potential (SSAEP) paradigm, responses were recorded to a continuous tone frequency-modulated (FM) four times a second by brief cosine pulses.
Results: Pure tone hearing sensitivity and environmental sound recognition were adequate. N100 and P200 components of cortical responses showed broadly normal latencies and amplitudes. P300 responses were well-formed but delayed. By contrast, SSAEPs to 50 millisecond FM pulses appeared absent in both patients. SSAEPs to 100 millisecond FM pulses were absent in the patient with bitemporal involvement, while responses from the individual with left temporal damage were small and substantially delayed, particularly over the left hemisphere.
Conclusions: These results compellingly demonstrate that the SSAEPs disclose auditory temporal processing abnormalities that can be missed using TOEP paradigms. The neurophysiological basis for the SSAEP abnormalities are discussed.
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ADHD - Poster Session 6 - 15.00 - 17.00		
Number	**Presenter**	**Poster Title**
41	Anselm Fuermaier	Detection of feigned adult ADHD with an Embedded Figures Test
42	Nella Korhonen	Subjective symptoms of ADHD at 40 years in a cohort with childhood ADHD followed from birth
43	Saleh Mohamed	Error monitoring and ADHD symptoms in adults: the effect of laterality and state regulation
44	Margaret Semrud-Clikeman	Unique white matter patterns in two presentations of ADHD using DTI

Detection of feigned adult ADHD with an Embedded Figures Test
Anselm B.M. Fuermaier, Lara Tucha, Meryem Grabski, Klaus W. Lange, Matthias Weisbrod, Steffen Aschenbrenner, Janneke Koerts, Oliver Tucha (1)
Objective: It has been shown that an increasing number of adults deliberately feign attention deficit hyperactivity disorder (ADHD), which emphasizes the need for new tests designed to detect feigned ADHD.
Participants and Methods: An Embedded Figures Test (EFT) was developed for the detection of feigned ADHD in adulthood. Fifty-one adults with ADHD were compared with 52 matched healthy individuals on the new EFT. Furthermore, 268 undergraduate students were randomly allocated in a simulation design to one of four experimental conditions, i.e. a control group, a naïve simulation group, a symptom-coached simulation group or a test-coached simulation group.
Results: The EFT was relatively easy to perform for both patients with ADHD and healthy comparisons as shown by low error rates and non-significant group differences. However, simulation groups differed from patients with ADHD by significant and large effects. An EFT index for the prediction of feigned ADHD was derived based on logistic regression coefficients. Receiver Operating Characteristics (ROC) demonstrated good classification accuracy of feigned ADHD relative to ADHD (AUC = 94.8%), i.e. high sensitivity (88%) and specificity (90%).
Conclusions: This study supports the utility of the EFT for the detection of feigned adult ADHD.
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Subjective symptoms of ADHD at 40 years in a cohort with childhood ADHD followed from birth
Nella Korhonen, Maarit Virta, Laura Hokkanen
Objective: The persistence of ADHD into adulthood is estimated to be 15-65%, but the long-term course of the disorder is not well known. Although ADHD has a strong genetic base, perinatal risks are known to increase the risk for ADHD. The aim of this study was to investigate the long-term effects of childhood ADHD in a population with perinatal risks.
Participants and methods: The participants were part of a prospective longitudinal study of a birth cohort with perinatal risks born from 1971-1974 in a single Finnish maternity hospital. After extensive clinical follow-up assessments in childhood and re-evaluation of the records in light of the DSM-IV criteria, 122 of 845 participants were classified as having ADHD. As part of the current follow-up, the participants reported subjective symptoms of ADHD

(ASRS part A) and executive dysfunction (BRIEF-A) at the age of 40. The ADHD group (n=30) was compared with a control group (n=36) and the remaining cohort (n=146).
Results: Of the ADHD group, 20% reached clinical range in ASRS compared with 5.6% of the control group and 6.8% of the remaining cohort. Also, more adults (21%) reported clinically significant symptoms of executive dysfunction (BRIEF-A: T≥65) compared with the control group (0%) and others (8.2%).
Conclusions: Approximately 20% of middle-aged adults with childhood ADHD associated with perinatal risks report clinically significant levels of ADHD symptoms and executive dysfunction. The self-reported persistence of ADHD symptoms in the ADHD group is higher than in other subgroups, but relatively low compared to other persistence estimates.
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Error monitoring and ADHD symptoms in adults: the effect of laterality and state regulation
Saleh Mohamed, Norbert Borger, Reint Geuze, Jaap van der Meere
Objective: Evidence is accumulating that error monitoring is impaired in individuals with Attention-deficit/ Hyperactivity Disorder (ADHD). The capacity to detect and correct errors is essential for learning, flexible behavioral adaptation, and achieving future goals. The aim of the present study is twofold: first to investigate the contribution of the left and right hemisphere to impaired error monitoring in adults with high ADHD symptoms. Second, to test whether the impaired error monitoring is associated with a deficiency in regulating the motor activation state of the participants.
Participants and Methods: From a pool of 87 university students, two groups were formed based on their scores on the Conners' Adult ADHD Rating Scales: a group with high (n = 30) and one with low (n = 26) scores. The participants performed a lexical decision task with visual half field stimuli. The motor activation state of the participants was manipulated by presenting the stimuli at a fast and slow event rate. Error monitoring is measured in terms of post-error adjustments (i.e., slowing down and improving performance accuracy after errors).
Results: participants with high ADHD symptoms do not slow down their performance after errors when stimuli were presented at slow rate in the right visual field. In the other conditions no group differences were found.
Conclusions: These results suggest that error monitoring in adults with ADHD is associated with affected left hemisphere ability to monitor and compensate for errors, especially when demands to optimize the activation state for the task are high.
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Unique white matter patterns in two presentations of ADHD using DTI
Margaret Semrud-Clikeman, Alena Svatkova, Jesse Bledsoe, Jodene Fine, Kyle Rudser, Igor Nestrasil
Objective: Attention-deficit/hyperactivity disorder predominantly inattentive (ADHD-PI) and combined (ADHD-C) subtypes are likely distinct disorders that differ neuroanatomically, neurochemically, and neuropsychologically. However, to date, little is known about specific white matter (WM) regions differentiating ADHD subtypes. To evaluate specific white matter regions that may differentiate between inattentive and combined presentations of ADHD.
Participants and Methods: This study examined differences in white matter microstructure using DTI. 20 children with ADHD-inattentive type, 18 with ADHD-combined type, and 27 controls completed an MRI. Voxel-wise analysis of DTI in major fiber bundles was completed using tract-based spatial statistics. Clusters showing diffusivity abnormalities were used as regions of interest for regression analysis between FA and neuropsychological measures.
Results: ADHD-PI group showed higher FA in the anterior thalamic radiations, inferior longitudinal fasciculus, and corticospinal tract. ADHD-C group showed higher FA in the bilateral cingulum bundle. WM clusters with FA irregularities in ADHD were associated with neurobehavioral ratings across groups. In the ADHD-PI group, differences in FA in the left ILF and ATR were accompanied by axial diffusivity (AD) abnormalities. In addition, the ADHD-PI group exhibited atypical mean diffusivity in the forceps minor (FMi) and left ATR and AD differences in right CB compared to healthy subjects. Radial diffusivity differences between ADHD-PI and ADHD-C were found in the FMi.
Conclusions: Difference in white matter microstructure in 2 presentations of ADHD suggest that the inattentive and combined types are two distinct disorders. Areas of white matter irregularitiy also predicted executive and behavioral functioning across groups
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Learning Disabilities/Academic Skills - Poster Session 6 - 15.00 - 17.00		
Number	**Presenter**	**Poster Title**
45	Bettina Kuske	First application of a new developed neuropsychological assessment for early detection of dementia in people with intellectual disabilities
46	Bettina Kuske	Early detection of dementia in people with intellectual disabilities – Experiences, special features and difficulties
47	Michel Nelwan	Limited near and far transfer of jungle memory working memory training effects on learning mathematics in children with attentional and mathematical difficulties
48	Neta Salner	The effect of spatial attention on reading errors in normal reading, letter position dyslexia, and surface dyslexia
49	Annette Scheper	The role of executive functioning in narrative construction in children with specific language impairment
(50)	Maya Yachini	PRESENTATION WITHDRAWN: The distribution of various types of developmental dysgraphia

First application of a new developed neuropsychological assessment for early detection of dementia in people with intellectual disabilities
Bettina Kuske, Sandra Verena Müller
Objective: Since life expectancy of individuals afflicted with intellectual disabilities (ID) has been constantly increasing, researchers and practitioners throughout the world have increasingly focused on the early detection of dementia in this group. In Germany, however, dementia screening for people with ID does not currently exist. We evaluated a new developed neuropsychological assessment, the Wolfenbütteler Dementia Test for Individuals with Intellectual Disabilities (WDTIM) in combination with the Dementia Screening Questionnaire for Individuals with Intellectual Disabilities (DSQIID).
Participants and Methods: The two instruments were evaluated in a prospective two-year follow-up study, during which we assessed 102 people with ID at 6-month intervals. The resulting data were analysed using qualitative and statistical analyses.
Results: Four groups of individuals emerged from the analysis: 1) confirmed suspicion, 2) no suspicion, 3) questionable suspicion and 4) early suspicion. Significant differences were found between groups 1) and 2). The WDTIM- and DSQIID-scores over time confirmed the suspicion for 7 participants with dementia diagnosis. We were able to administer The WDTIM to 90 - 100 % of all participants suffering from mild to moderate ID.
Conclusions: The WDTIM shows to have a good application for people with mild to moderate ID and to be appropriate for detecting cognitive changes. The instruments confirmed suspicion and diagnosis of dementia. Using the two instruments in combination achieved greater accuracy in supporting a dementia suspicion than using the DSQIID alone.
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Early detection of dementia in people with intellectual disabilities – Experiences, special features and difficulties
Bettina Kuske, Sandra Verena Müller
Objective: Regarding the increasing number of people with intellectual disabilities (ID) suffering from dementia, early detection is very important for appropriate accompanying these people. Diagnosis of dementia differs from the conventional diagnostic procedure and is complicated by several factors. This study

investigated specific features or challenges of the early detection of dementia symptoms in people with ID.
Participants and Methods: Based on 408 test situations, experiences, specific features and testing difficulties were identified and summarized. 102 people with ID were assessed at 6 months intervals during a two-year follow-up study. In most instances, both an informant interview and a neuropsychological assessment were used for early detection of dementia.
Results: Overall, the neuropsychological assessment was used 328 times and the informant interview was used in all test situations. Identified challenges and difficulties arise from characteristic features of individuals with ID (e. g. communication skills, abilities of perception, introspection, behaviour and other) and further factors (e. g. medication, psychiatric disorders and other). Difficulties of dementia diagnosis and the resulting problems were worked out from various perspectives.
Conclusions: The results identified factors which have to be considered from diagnosticians and therefore provide useful information for the implementation of dementia instruments as well as for the whole test situation with people with ID.
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Limited near and far transfer of Jungle Memory working memory training effects on learning mathematics in children with attentional and mathematical difficulties
Michel Nelwan, Evelyn Kroesbergen
Effects of working memory training (WMT) is a much-debated topic in the literature. Contradictory findings are reported. In the domain of mathematics, effects of WMT have been predominantly unsatisfactory, although there are some notable exceptions and few studies have been conducted in this field. These studies often measure direct effects of the training on mathematics performance only. Long term effects or gains in formal training in mathematics are frequently neglected. The goal of this randomized controlled trial was to investigate whether Jungle Memory working memory training (JMWMT) effects performance on tasks similar to the trained tasks, performance in mathematics and gains on a mathematics training (MT) in school aged children between 9-12 years old (N=64) with both attentional and mathematical difficulties. Children were randomly assigned to three groups: (1) JMWT+MT, (2) MT+JMWMT, and MT only. Analyses showed no and even negative short term effects of JMWMT on near transfer measures of working memory. In addition, Bayesian analyses showed support for the hypothesis that children in all three groups made equal gains in mathematics, indicating a training effect of MT without added effects of JMWMT. Results are discussed against a theoretical background and in terms of motivational issues.
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The effect of spatial attention on reading errors in normal reading, letter position dyslexia, and surface dyslexia
Neta Salner, Naama Friedmann, Eran Chajut
Objective: This study tested the role of visual selective attention allocation in reading, through testing its effect on reading-errors of letter transposition and sublexical reading in three groups of readers.
Participants and Methods: The participants were 48 adults: 22 with normal reading (11 females, mean age 27), and 26 with dyslexia: 13 with Letter Position Dyslexia (LPD, who make letter transpositions within words while reading; 12 females, mean age 27), and 13 with surface dyslexia (who read via the sublexical route; 12 females, mean age 24). They read aloud migratable words (in which letter transpositions create other existing words, e.g., TRIAL-trail) and potentiophones (words that can be read as another word via letter-to-sound conversion, e.g., NONE-known) in a Posner-like task.
Results: The invalid condition induced more letter transpositions in the normal reading group, whereas the sublexical reading errors were not affected by the validity of the condition. Reading errors of the individuals with dyslexia, either LPD or surface dyslexia, were not affected by the attentional manipulation.
Conclusions: The performance of the normal reading group implies that processes governed by attention allocation are involved in letter-position encoding, but not in grapheme-to-phoneme conversion. The lack of attentional effect on letter transpositions in the LPD group may suggest that these readers do not gain from allocating attention to the whole word; rather, they may need to focus attention on specific letter positions within the word in order to properly encode letter-positions.
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The role of executive functioning in narrative construction in children with specific language impairment
Annette Scheper, Wendy Boelhouwer
Objective*:* Children with Specific Language Impairment (SLI) are at risk for having problems with narrating a story, since their syntactic abilities are often lacking. Recent studies show that language ability is related to executive functioning (EF). EF comprises higher-order neurocognitive skills that control and coordinate attention, thought and action. Well-developed EF might help the children with SLI compensate for their language difficulties in narrative construction. The present study aims at investigating the relationship between narrative ability and EF of children with SLI and their TD peers.
Participants and methods*:* Sixty-one Dutch children with SLI and forty-nine Dutch TD children between the ages of 9 and 12 took part in the study. Narrative tasks (story retelling by Bus story and story generation by Frog story) and EF tasks (WISC-digit-recall, Nonword-repetition, Block-recall and subtests of TEA-Ch) were administered. Correlational and hierarchical regression analyses were computed.
Results*:* Children with SLI are outperformed on all narrative measures as well as on verbal EF tasks by their TD peers. The groups perform equally well on non-verbal EF tasks. Correlational analyses show that EF and narrative construction are related. Cognitive flexibility is a predictor of the quality of retelling the plot structure in SLI.
Conclusions*:* Children with SLI that have better EF skills are more-skilled narrators. Cognitive flexibility is a predictor of the quality of the plot structure in story retelling in SLI. Thus, children with SLI use their well-developed cognitive flexibility skills to compensate for their language difficulties in narrating a story.
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